Project and Enterprise Financing

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Lectures 10 - 12: Public Equity Financing - Initial Public Offerings (IPOs)

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1. Definition

Initial Public Offering (IPO)

= **First listing** of a firm's shares **on the stock exchange** in connection with the **selling of** existing or new **shares to the general public**

= **Going Public**

Number of Initial Public Offerings: 1997 – 2015

	1997	98	99	2000	1	2	3	4	5	6	7	8	9	2010	11	12	13	14	15	Mean
USA	473	284	477	381	79	66	63	173	159	157	159	21	41	91	81	93	157	207	117	**173**
UK	135	100	127	301	170	99	83	286	404	337	233	61	20	85	65	61	91	127	81	**151**
DE	22	57	167	153	21	6	0	5	14	35	23	2	1	8	6	5	6	7	14	**29**
CH	15	17	19	28	15	5	1	4	10	9	10	7	6	4	2	4	1	6	3	**9**
AT	2	2	3	4	5	0	2	0	4	6	3	0	0	0	1	0	0	1	0	**2**

USA: NYSE, AMEX, Nasdaq; **UK**: LSE (Main Market, AIM); **DE**: FSE (Official Ma., Neuer Markt, Primary Stand.)
CH: Swiss Exchange (Official Market); **AT**: VSE (Official Market)

2. Reasons and Motivations to Go Public

- **Source** of new capital
- **Diversification** for pre-IPO owners (Altaktionäre)
- **Reputation** and **publicity**
- **Employee** and **management** stock **ownership**
- **Privatization** of state owned firms

(a) Source of new capital

- **External financing via the capital market**
- **Growth companies: need for additional capital**
- **New equity capital**
  - ‘Inexhaustible’ capital source
  - When capital is needed: **seasoned capital offering**, or other instruments, like e.g. warrant bonds or convertible bonds
  - The new equity capital is **unlimited** at disposal
- **Financing of positive NPV projects**

❍ Better capital structure

- Debt-equity ratio ↓
- Equity ratio ↑

❍ Better rating: lower cost of financing

- **Seasoned equity offerings** act as "finance multiplier":
  - **Additional debt** can **easier** be borrowed
  - **Debt** at more favorable terms
  - The **risk premium drops** because of a better rating

- **Allocation of resources to finance growth** are e.g.
  - Enlargement of existing **market shares**
  - Opening up of **new sales markets**
  - Development and introduction of **newer products**
  - **Increase in capacity**
  - Acquisition of **competitors**
  - Increased financing of **research and development**

(b) Diversification for pre-IPO owners

- **Private person as owner**
  - Usually: A big part of the money that belongs to private individuals is bound in the company
  - Extreme dependence of success/failure of the company

- IPO: The created **shareholder value** can be realized.
  - **Investment** of the proceeds **in other assets**
  - **Degree of diversification** of the personal investment portfolio ↑

    ➔ **Increase in wealth** for the entrepreneur

❍ IPO: Protection of the pre-IPO owner's influence

- Influence has not necessarily to drop
- Retail investors: distribution of the shares among many small investors
- Interest of small investors: high yield (return)

❍ **IPO:** Possibility to **withdraw** from **active management**

(c) Reputation and publicity

❍ IPO: Increased publicity

- **Marketing activities** around the issue
- Publicity and **image** ↑

  Positive effects on the **behavior of customers, suppliers, banks** and potential **employees**.

❍ Regular disclosure requirements:

- Interim reports, business reports, meetings for analysts and investors
- Extensive IPO prospectus
- Event driven publicity: **ad-hoc** messages of **important events**
- Advantage of an active communication policy: image-building

❍ Disclosure requirements ≠ burdensome

- Information eases the valuation of a company, valuation risk ↓
- Consequence:
  - **lower risk premium**
  - higher stock price
  - **higher market value** of the company

(d) Employee stock ownership

- General: increase in motivation, image effects
- **Managers:**
  - Stocks as **incentive** to act **in the sense of the owners** (e.g. as part of the salary (stock option plans (danger of short-run maximization the shareholder value))
  - Reduction of **agency problems**

❍ Employees:

- Participation in an increasing firm value
- Issue price: Typically discount
- From the viewpoint of the stockholders: Employee stock ownership **increases the motivation**
- **Attention: bad diversification**

  If the company becomes **insolvent**: not only the **job is lost** but also a part of the **personal assets are lost**

(e) Privatization of state owned firms

- **Main reasons for privatizations:**
  - Raising of capital for the **budget**
  - Increase of the **operating efficiency**
  - **Reduction** of state **influence**
  - Increase in **equity holding** of the **population**

- **Privatization via going public:**
  - **Case-by-Case** privatization (standard procedure)
  - **Mass privatization** (CEE-countries)

❍ Empirical evidence: operating performance

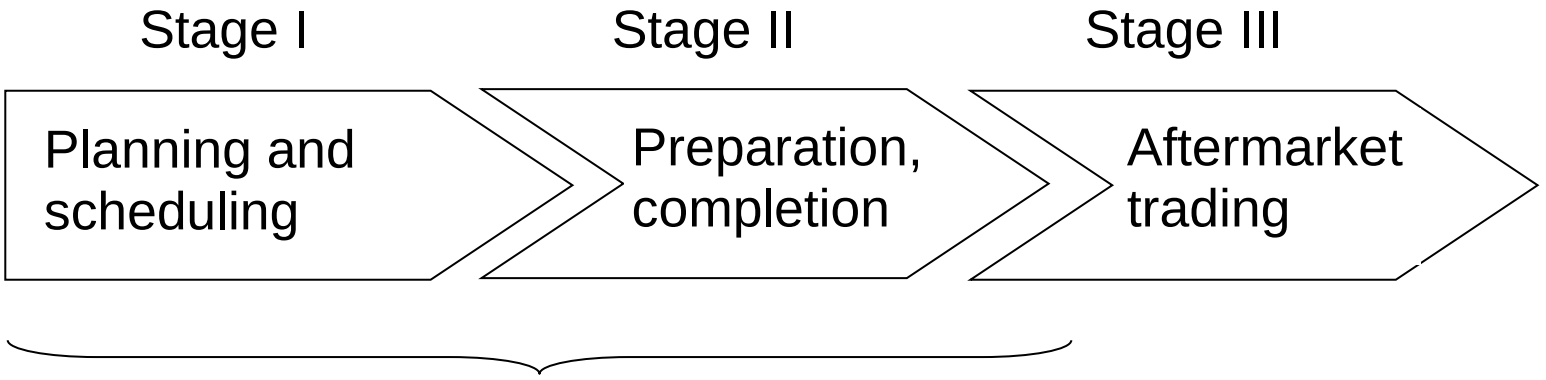
- **Industrialized countries: D'Souza/Megginson (JF, 1999)**

  - Privatizations in 28 countries
  - Operating performance ↑: profitability (ROS, ROA, ROE) ↑
    operating efficiency ↑
    sales ↑
    capital expenditure (Investitionen) ↑
    no of employees →

- **Transition economies: Aussenegg/Jelic (EFM, 2007)**
  (***see also:*** *http://ssrn.com/abstract=933116*)

  - CEE-countries: transition process from a centrally planned to a market system
  - Operating performance ↓ (at least in the first 6 years after privatization)
  - **Attention:** The success of firms that are dismissed into "freedom" is strongly influenced by the economic environment in the corresponding country (e.g. legislation)

3. The IPO Process



Institutional aspects

Empirical facts and **Explanatory approaches**
for observable price phenomena

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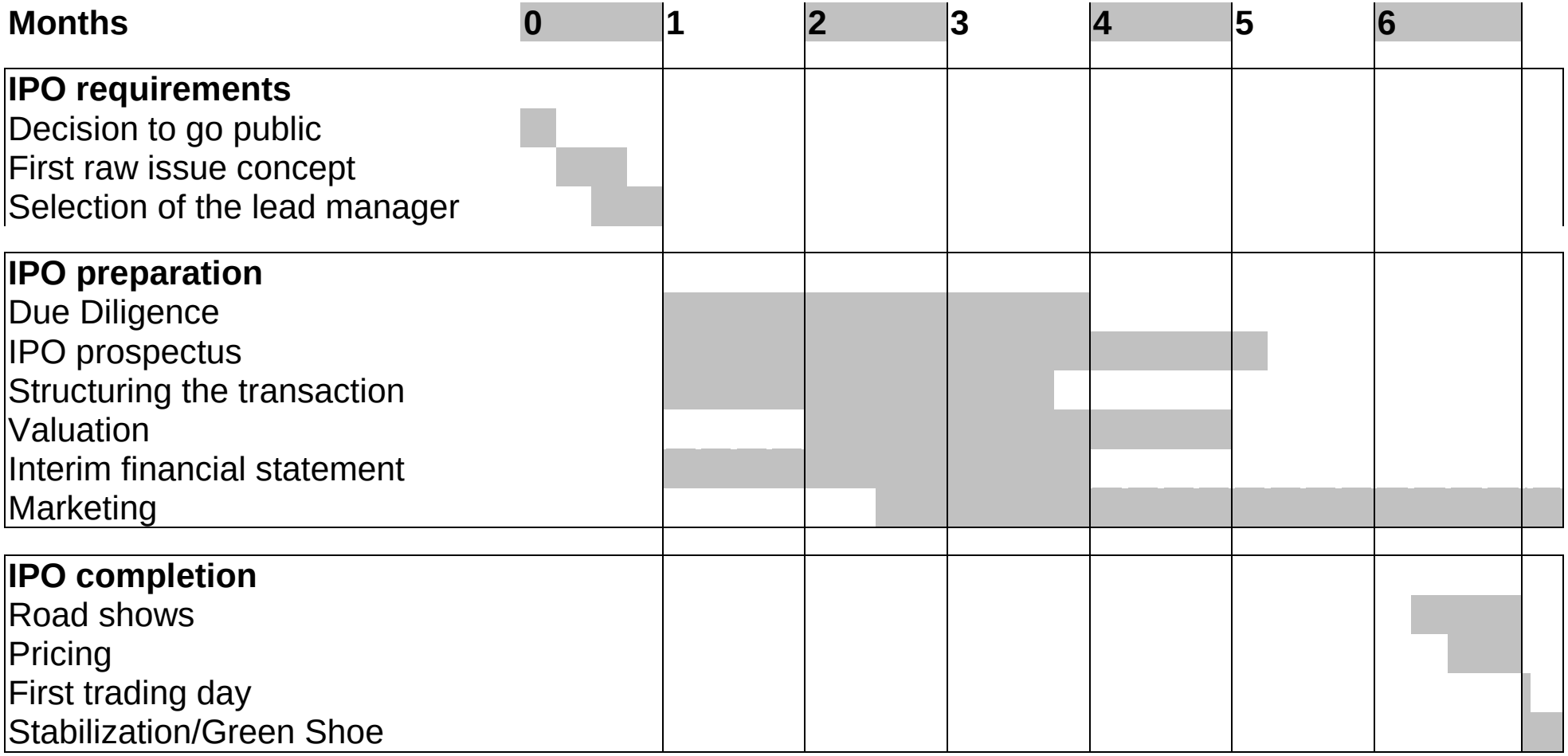
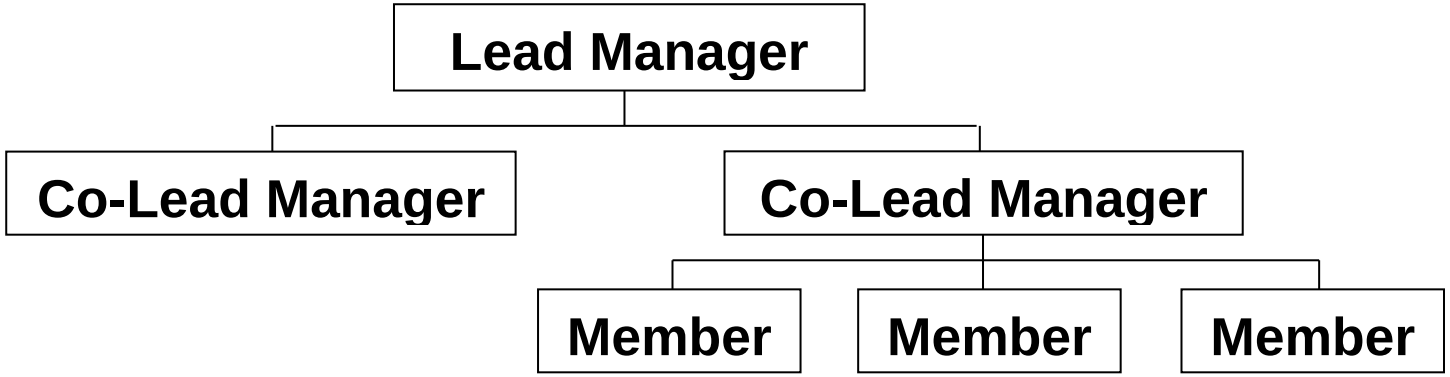
(a) Typical timetable



(b) Selection of the lead manager

- **Banking Syndicate:** Combination of autonomous banks to conduct an issue



- **Advantage**: Increased placing power, distribution of the placing risk, invitation to take part in issues lead by other banks

Example

Novasoft AG

Heidelberg

were admitted to the Geregelter Markt of the Frankfurter Wertpapierbörse (Frankfurt Stock Exchange)
and to trading on the

Neuer Markt

Frankfurt am Main, November 1999

Dresdner Bank
Aktiengesellschaft

Lead manager

Commerzbank
Aktiengesellschaft

Co-Lead manager

Underwriter syndicate - Tasks

- Underwriting and distribution of the issue
- Consulting and supporting of the issuer (firm)
- Valuation of the issuer
- Pricing

(c) Selection of the stock exchange

- **Selection criteria:**
  - Region, in which the firm **operates**
  - Region, in which the firm would **like to expand**
  - Reputation and liquidity of the stock exchange
  - Admission requirements
  - Costs of going public

(d) Firm valuation

- General problem: Fixation of the issue price (pricing)
- Basis for pricing an issue: Firm valuation
- **Valuation procedures:**
  - Discounted Cash-Flow Method (main method)
  - Method of comparison

❍ Discounted Cash-Flow Method

Firm Value V (Entity-Approach) (based on the Gordon growth model):

$$V = \sum_{t=1}^{T} C_t \cdot (1 + WACC)^{-t} + \frac{C_T \cdot (1+g)}{(WACC - g)} \cdot (1 + WACC)^{-T} + NOA$$

$$WACC = r_E \cdot \frac{E}{E+D} + r_D \cdot (1-\tau) \cdot \frac{D}{E+D}$$

$$E = V - D$$

$$\text{Value of one share} = \frac{E}{N}$$

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T	Immediate planning period/horizon
C_t	Free Cash-Flow in period t
C_T	Constant (p.a.) Free Cash-Flow for periods after t = T
NOA	Non-Operating Assets
r_E	Expected return on equity, $r_E = r_F + \beta \cdot (r_M - r_F)$
r_D	Cost of debt
τ	Corporate tax rate
V	Firm Value (market value of total assets, V = E + D)
E	Equity (market value)
D	Debt (market value)
r_F	Risk free rate
r_M	Expected return of market portfolio (stock market index)
β	Beta
N	Number of shares outstanding

(e) Cost structure

USA: Cost of IPOs, SEOs, Bonds

Proceeds (millions of dollars)	Equity						Bonds					
	IPOs			SEOs			Convertible Bonds			Straight Bonds		
	GS[a]	E[b]	TDC[c]	GS	E	TDC	GS	E	TDC	GS	E	TDC
$ 2–9.99	9.05%	7.91%	16.96%	7.72%	5.56%	13.28%	6.07%	2.68%	8.75%	2.07%	2.32%	4.39%
10–19.99	7.24	4.39	11.63	6.23	2.49	8.72	5.48	3.18	8.66	1.36	1.40	2.76
20–39.99	7.01	2.69	9.70	5.60	1.33	6.93	4.16	1.95	6.11	1.54	0.88	2.42
40–59.99	6.96	1.76	8.72	5.05	0.82	5.87	3.26	1.04	4.30	0.72	0.60	1.32
60–79.99	6.74	1.46	8.20	4.57	0.61	5.18	2.64	0.59	3.23	1.76	0.58	2.34
80–99.99	6.47	1.44	7.91	4.25	0.48	4.73	2.43	0.61	3.04	1.55	0.61	2.16
100–199.99	6.03	1.03	7.06	3.85	0.37	4.22	2.34	0.42	2.76	1.77	0.54	2.31
200–499.99	5.67	0.86	6.53	3.26	0.21	3.47	1.99	0.19	2.18	1.79	0.40	2.19
500 and up	5.21	0.51	5.72	3.03	0.12	3.15	2.00	0.09	2.09	1.39	0.25	1.64
Average	7.31%	3.69%	11.00%	5.44%	1.67%	7.11%	2.92%	0.87%	3.79%	1.62%	0.62%	2.24%

Note:
[a]GS—gross spreads as a percentage of total proceeds, including management fee, underwriting fee, and selling concession.
[b]E—other direct expenses as a percentage of total proceeds (including registration fee and printing, legal, and auditing costs)
[c]TDC—total direct costs as a percentage of total proceeds (total direct costs are the sum of gross spreads and other direct expenses)
Source: Reprinted with permission from the *Journal of Financial Research*, Vol. 19, No. 1 (Spring 1996), pp. 59–74, "Th Capital," by Inmoo Lee, Scott Lochhead, Jay Ritter, and Quanshui Zhao.

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(f) Issue prospectus

- **Important information about issuer and underwriters**
- **The offering:** price, volume, subscription period (Zeichnungsperiode), first trading day, dividend policy, voting rights, ISIN (International Securities Identification Number) and local securities code number (Wertpapier-Kenn-Nummer, WKN)
- **The company:** Historical milestones, shareholders, capitalization, application of issue proceeds (Emissionserlös)
- **Risk factors**
- **Business activities**
- **Financial section:** Financial statements of the last years

(g) Issue prospectus - Example: The case of Novasoft

❍ The Offer:

- 1,000,000 new shares (capital increase; extraordinary general meeting 20.8.1999; no subscription rights for the existing shareholders)
- plus 560,000 existing shares
- plus up to 240,000 existing shares (greenshoe shares)

  ➔ Lead manager: option to acquire (additional) shares (30 days)
- Total placement volume: 1,560,000 to 1,800,000 shares
- Placement period: 10.11. – 12.11.1999
- Public offering: Germany
- Private Placement: outside Germany
- Bookbuilding range: €18 - €21 (per share), published on 10.11.1999
- Issue price: published on 15.11.1999
- Up to 6%: reserved for employees, executives and business partners

❍ The Company:

- **Formation and development**
  - Founded as GmbH on 19.10.1989 (Novasoft Consulting GmbH)
    ➔ Dr. Kurt-Georg Konrad, Dr. Ladislaus Gotthard
  - Ordinary share capital DM 50,000.- (≈ €25,500)
  - Purpose of the company: performance of consulting in the area of data processing and the creation of software
  - 21.7.1999: renamed to Novasoft GmbH

- **Change of legal form to a stock-corporation (Aktiengesellschaft)**
  - Conversion of Novasoft GmbH into Novasoft AG (23.8.1999)
  - Owners: Dr. Kurt-Georg Konrad, Dr. Ladislaus Gotthard

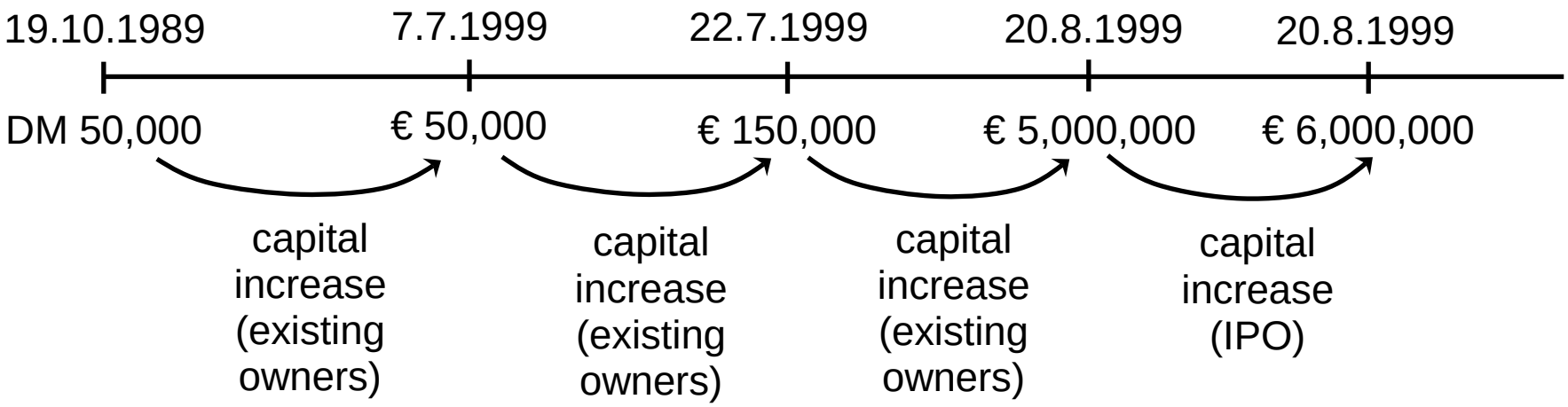
- **Stock exchange listing**
  - Aggregated share capital: admitted to the General Market (2. segment)
  - Trading: scheduled to begin on 15.11.1999
- **Lock-up period:** Prohibition on the disposal of shares
  - Novasoft and the existing shareholders agreed: no offer for sale of Novasoft shares within the first six months of stock market trading.
  - No offer for sale for a further six months without the approval of Dresdner Bank (lead manager).
- **Novasoft's area of activity**
  - Full-service provider for implementing SAP applications
  - For large enterprises

- **Management Board**
  - Konrad: Finance, IT, organization, inv. relations, business partners
    - ➔ 43, before 1989: research assistant (research institute in Aachen), worked for SAP
  - Gotthard: Sales, business partners, equity interests
    - ➔ 44, before 1989: research assistant (Univ. of Technology, Aachen), worked for SAP

- **Shareholders**

	Before IPO		After IPO (without greenshoe)		After IPO (with greenshoe)	
	shares	%	shares	%	shares	%
Konrad	2,500,000	50.0	2,220,000	37.0	2,100,000	35.0
Gotthard	2,500,000	50.0	2,220,000	37.0	2,100,000	35.0
Free float	-		1,560,000	26.0	1,800,000	30.0
Total	5,000,000	100.0	6,000,000	100.0	6,000,000	100.0

- **Capitalization**



❍ Risk factors:

"Before deciding to buy Novasoft shares under the terms of this offering, future investors should consider carefully all the specific risk factors described below … "

- **Dependence on SAP and its products**
  - Large majority of sales: SAP products
  - Dependences on the strategy and market position of SAP
  - Agreement with SAP: SAP logo partner until Dec 2000
    - ➔ Contract can be terminated by either party
    - ➔ Novasoft subsidiaries are silently tolerated by SAP

- **Dependence on key customers**
  - Biggest customer: 31% of sales
  - 10 largest customers: 80% of sales

    An unexpected reduction in the volume of orders from key customers would have a negative impact on sales and earnings

- **Technology change**
  - IT industry: rapidly changing technologies and customer requirements, ongoing introduction of new products, short lifecycle
  - Delay in launching new products, lack of long-term acceptance

    ➔ negative effect on sales and earnings

- **And many more …**

(h) Road Shows

- **Marketing events** for institutional investors
  - Presentation of the **company** and the **equity-story** (20 minutes)
  - Talks in confidence („One-to-Ones“)
  - Many individual questions
  - Very intensive

(i) Pricing procedures

- Fixing the issue price: In the area of tension between different interests
  - **Existing shareholders:** high issue price (maximum issue proceeds)
  - **Underwriting banks:** (i) high issue price (=basis for the fees); (ii) low issue price (as the distribution of the shares is easier and the placement risk drops)
  - **Investors:** low issue price (minimal investment costs and therefore maximum return)

- Starting-point for the pricing process: Firm valuation

- International: 4 main mechanisms
  - Auction based procedures
  - Firm commitment offering
  - Best Effort Offering
  - Bookbuilding procedure

❍ Bookbuilding

- Most common method today.
- Collection of **price-volume bids** from (typically) institutional investors.
- Leadmanager: "**Bookrunner**"
- **Price perceptions of the "market"** can be considered.
- Issue price is normally **not** fixed at the **maximal possible price** (different to an auction).
- In addition, the **quality of investors** is used in the decision on issue price and allocation (different to an auction).
- Aim: The shares should be transferred into "strong hands" to reduce the risk of a price pressure on the first trading days.
- The underwriters take the total placing risk.

Example: Bookbuilding

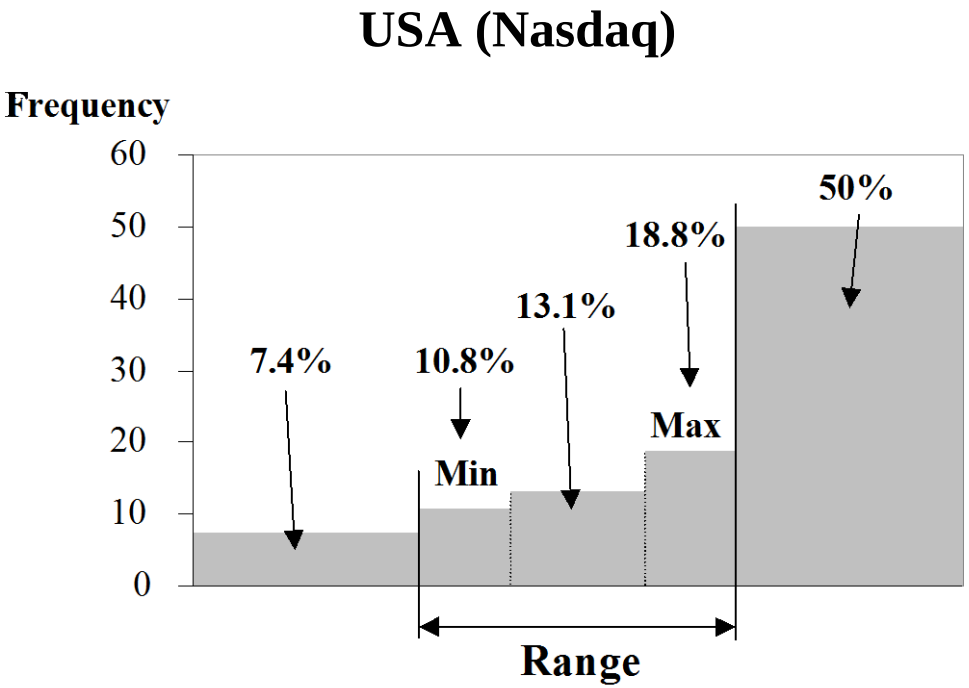
IPO: 3 million shares can be sold

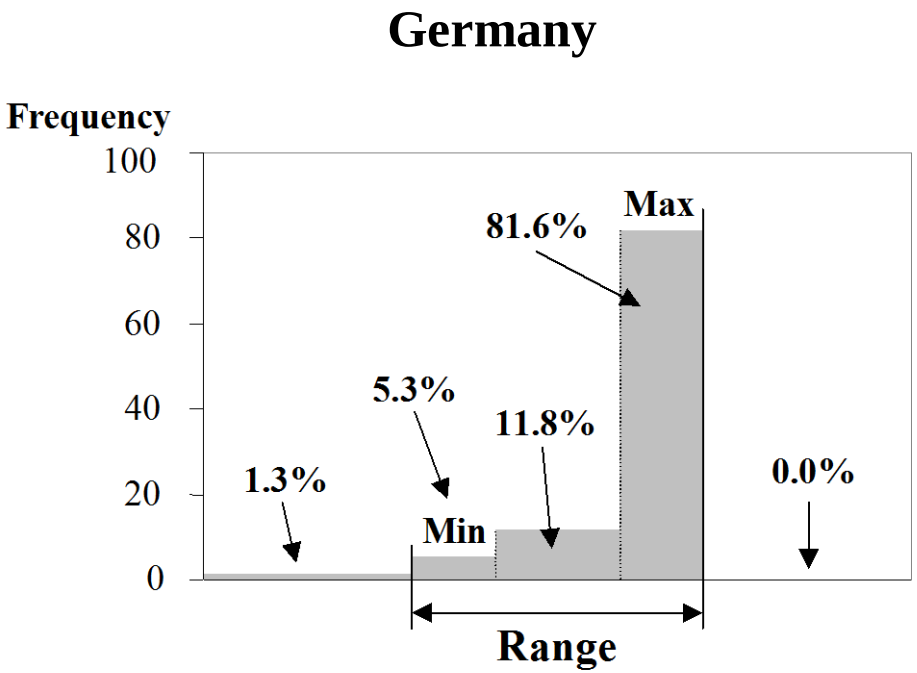
Price	Cumulative shares **applied** for	Cumulative number of **Investors**
175	22,000	2
170	96,000	86
165	288,000	213
160	1,012,000	623
155	1,800,000	1,746
150	**3,264,200**	**4,000**
145	8,220,200	7,520
140	**20,450,200**	**13,930**

- A price of around **150** would clear the market (**fair value**).
- An **issue price** of, e.g., **140** would imply a potential **initial return** of about **7%.**
- The company should also consider **shareholders base** (e.g. 4,000/13,930 investors).
- Note that investors who offer less than the issue price do not receive any shares.
- Investors who offered more than the issue price receive shares at the issue price.
- Typically **not all** investors will **receive all shares** requested. This is called **rationing** (balloting).

Bookbuilding Range

- **Issue price relatively to the bookbuilding range (1999-2000)**





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(j) **Green Shoe Option** (Over Allotment Option)

- The underwriters have the right to **buy** in addition to the "official" issue volume a particular amount of **additional shares** (often **10 to 15%** of the "official" issue volume) **at the issue price** from the issuer.
- The value of this call option increases with the demand for the issue.
- Possibility to build a **short position.**
- Possibility to stabilize the share price on the first trading days.
- Placing risk drops

4. Initial Return and Underpricing

(a) Calculation and Evidence

- **Initial Return:** $$IR = \frac{P_1 - P_0}{P_0}$$

  P_1 = Closing price on the first trading day

  P_0 = Issue price

- **Underpricing:** $$UP = IR - \frac{B_1 - B_0}{B_0}$$

  B_1 = Closing price of the benchmark on the first trading day of the IPO

  B_0 = Closing price of the benchmark on the date the IPO issue price is fixed

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Example:

IPO of Microsoft on 13.3.1986

Issue price (on issue date): P_0 = \$21

Closing price on the first trading day: P_1 = \$28

Benchmark (Index) on the issue date: B_0 = 540

Benchmark (Index) on the close of the first trading day B_1 = 543.4

Initial Return: $$IR = \frac{P_1 - P_0}{P_0} = \frac{28 - 21}{21} = +33.3\%$$

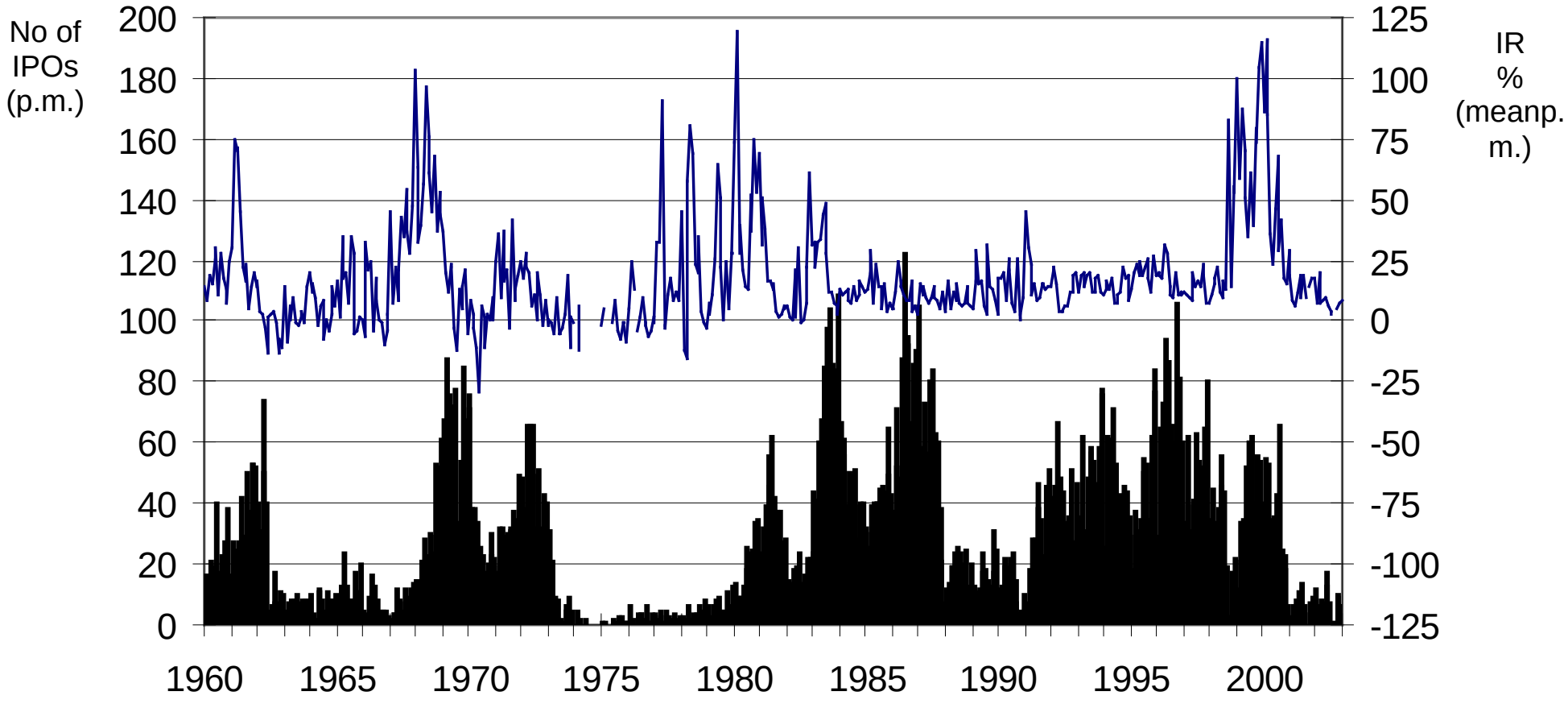
Underpricing: $$UP = IR - \frac{B_1 - B_0}{B_0} = 33.3 - \frac{543.4 - 540}{540} = +32.7\%$$

❍ International Evidence:

Country	Author(s)	No of IPOs	Period	**Initial Return (%)**
Australian	Lee et al.	1,562	1976-2011	**21.8**
Austria	Aussenegg	103	1964-2013	**6.4**
Brazil	Aggarwal et al.	275	1979-2011	**33.1**
China	Chen at al.	2,637	1990-2014	**113.5**
Finland	Keloharju	168	1971-2013	**16.9**
France	Husson et al.	697	1983-2010	**10.5**
Germany	Ljungqvist et al.	779	1978-2014	**23.0**
Hong Kong	McGuinness; Ljungqvist et al.	334	1980-2013	**15.8**
Italy	Arosio et al.	312	1985-2013	**15.2**
Japan	Fukuda; Hiraki et al.	3313	1970-2014	**42.8**
Malaysia	Isa et al.	474	1980-2013	**56.2**
Netherlands	Wessels, Eijgenhuijsen et al.	181	1982-2006	**10.2**
UK	Dimson et al.	4,932	1959-2012	**16.0**
USA	Ibbostson et al; Ritter	12,702	1960-2014	**16.9**

Source: Loughran, Ritter, Rydqvist (1994, updated 2015)

USA: Initial Return and number of IPOs over time



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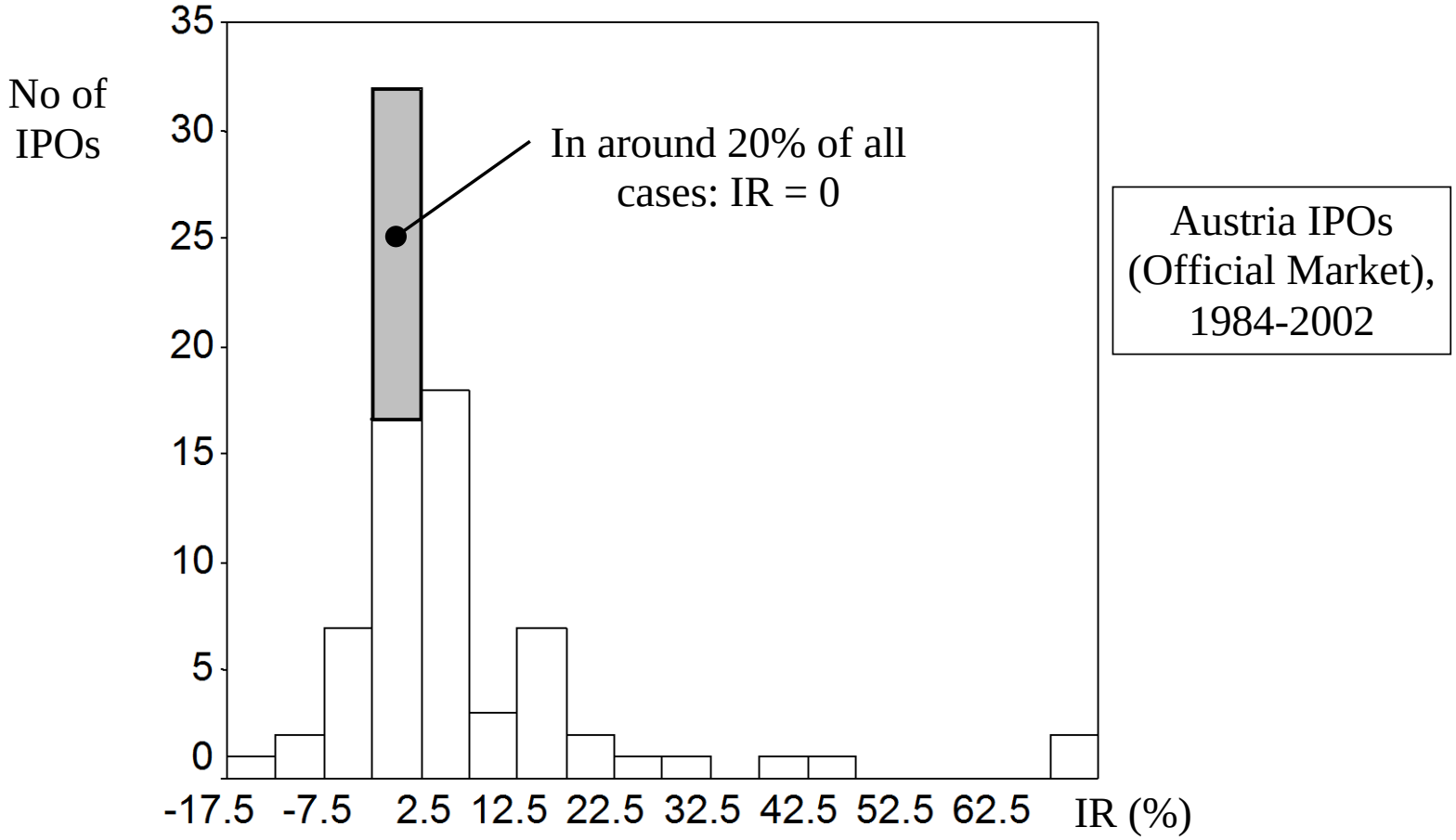
(b) Explanatory approaches

- **Hedging against lawsuits (informational asymmetry)**
  - Issuer and underwriter guarantee that they have revealed all factors relevant for valuing the firm.
  - If important information have been "forgotten": Investors can suit
  - The probability of successful lawsuits increase if the price drops strongly after the issue.
  - **Empirical evidence:**
    - Lowry/Schwert (JFE, 2002): IR ↑ with <u>increasing risk</u> of an issue
    - Carter et al (JF, 1998): IR ↑ when the <u>reputation</u> of the <u>lead manager</u> is low

❍ Technical Effects, like price stabilization on the first trading day

Example:



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Informational rents to institutional investors

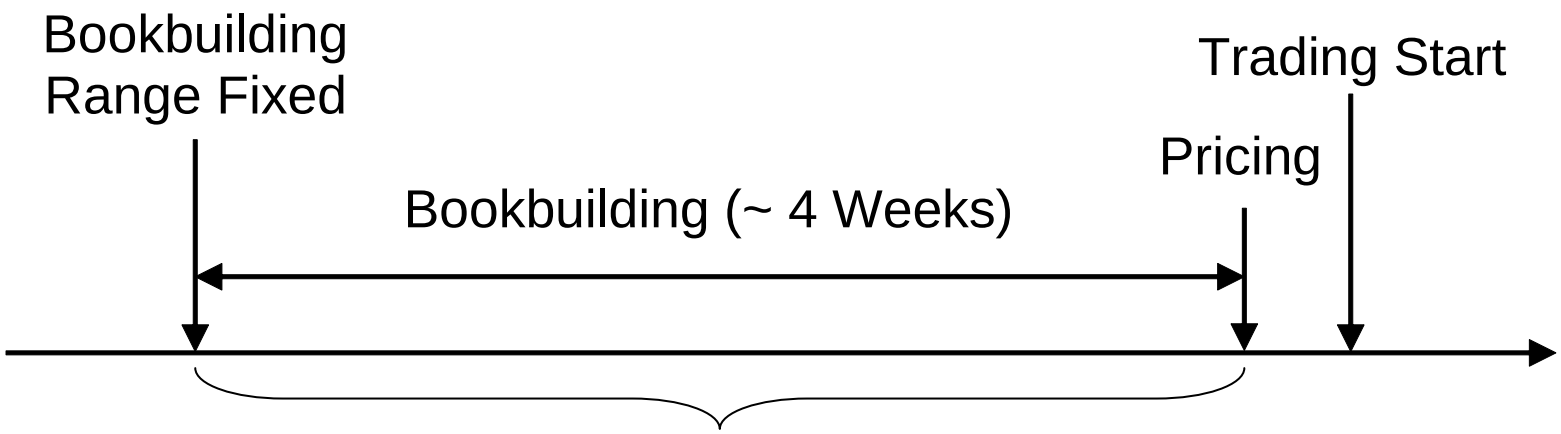
- Prior to fixing the issue price: **Lead manager asks institutional investors** about their price and volume beliefs (for each issue)
- Institutional investors **get for this information** from the **"good" issues**:
  - a **larger allocation**, and
  - with an **issue price** that is only **partially adjusted** to the true firm value

    This effect is called **Partial adjustment Phenomenon**: Benveniste and Spindt (JFE, 1989))
- **Empirical evidence:**
  - Hanley (JFE, 1993): USA
  - Aussenegg et al (2002; JFQA, 2006): USA, Germany

    http://ssrn.com/abstract=302917; http://ssrn.com/abstract=384920

❍ Some evidence of Aussenegg et al. (JFQA, 2006)

- **Bookbuilding (BB): USA**



- **Information collection** (institutional investors)
- **No** When-Issued Market

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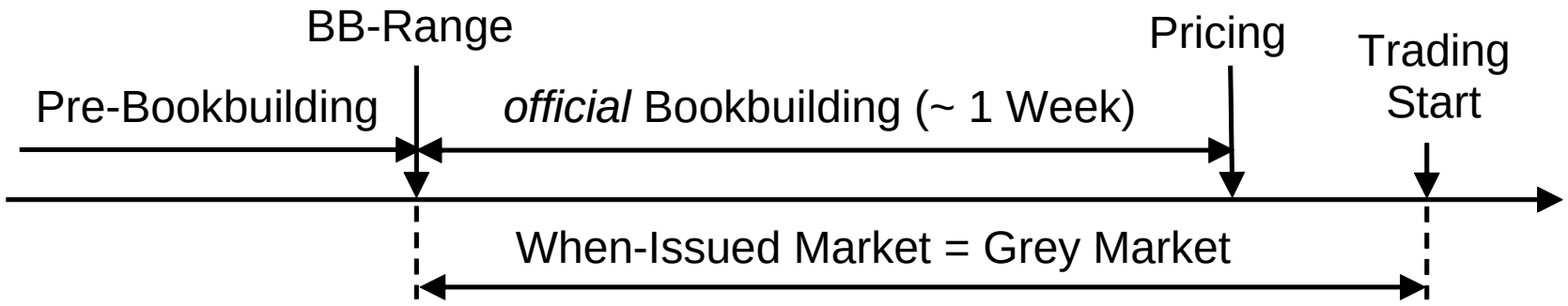
- **Reward** for providing **pricing-relevant information**
  - **Informational rents** are paid to institutional investors;

    In the form of higher allocation of underpriced shares

- **Partial Adjustment Phenomenon**
  - Is **investigated** by comparing the relationship between **Under-pricing** and **Revision** (return from the mean of the BB-Range till the offer price)
  - **Partial Adjustment** if: **Positive relationship** between **Under-pricing** and **Revision**
  - USA: Hanley (1993), Bradley/Jordan (2002), Loughran/Ritter (2002), Lowry/Schwert (2002)

- **Bookbuilding: Europe (especially Germany)**



➔ Pricing during (OTC) trading (market prices exist!).

- Does the when-issued market **replace** the **informational function** of **bookbuilding**?
- Does the when-issued market, therefore, **contain pricing relevant information**?
- Does a **partial adjustment phenomenon exist (informational rents)** in such an environment **or not**?

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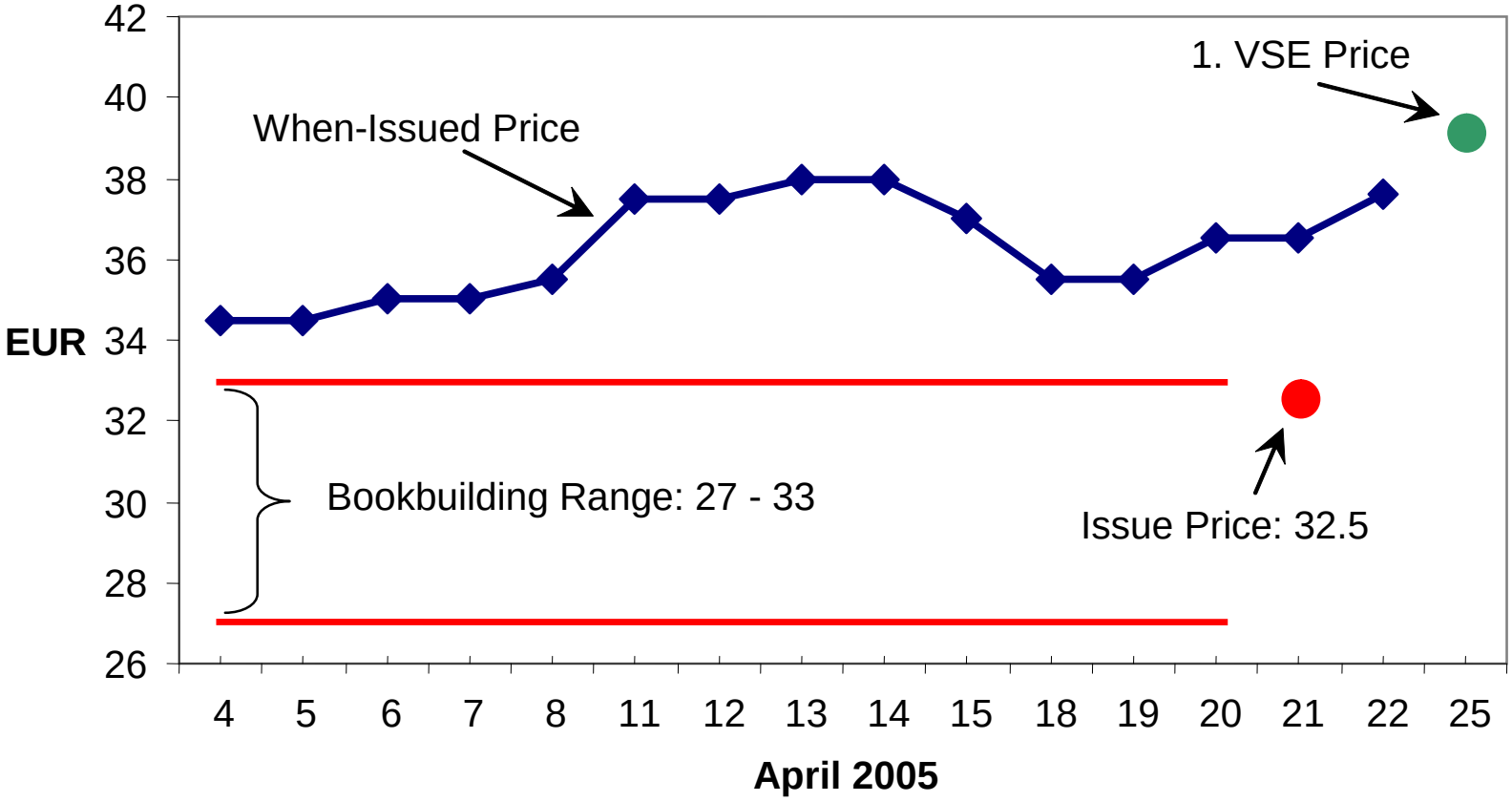
- **When-Issued Market**
  - **Grey market**
  - **Forward market** with **physical delivery** (when trading starts, no bet)
  - All trades are **canceled** if the IPO is canceled or delayed
  - **OTC market**
  - **Independent stockbrokers**
    - Schnigge AG (Düsseldorf)
    - Lang & Schwarz Wertpapierhandel AG (Düsseldorf)
    - Berliner Freiverkehr AG (Berlin)
    - Tullett & Tokyo Liberty Ltd. (London)

- **When-Issued Market (2)**
  - **Starts: After** fixing the **bookbuilding range**
  - **Ends:** Briefly **before** the **first trading day**
  - **Investors:** Are able to **buy/sell shares** of the IPO firm **prior** to the **first trading day** on the stock exchange
    - **Institutional investors**: Typically more on the **sell**er side
    - **Retail investors**: Typically more on the **buy**er side (Dorn, 2009)
  - **Germany:** 1999 - 2004 at **more than 94%** of all IPOs
  - **Last price** in the when-issued market**: good forecast** for the first market prices on the stock exchange
  - **Trading volume:** comparable to usual trading volume in the secondary market

- **When-Issued Market (3)**

Example: Raiffeisen International



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- **Main Results**
  - **No Partial Adjustment Phenomenon** as in the US
  - Thus, the **when issued market replaces** the <u>informational function</u> of **bookbuilding** (as soon as the when issued market starts)
  - **BUT**:
    - Underwriter **collect *costly* information** from investors already **PRIOR** to the fixing of the bookbuilding range
    - Evidence of **informational rents** granted for providing this information
  - Bookbuilding in Europe $\neq$ Bookbuilding in the US

5. Long-Run (Under-) Performance

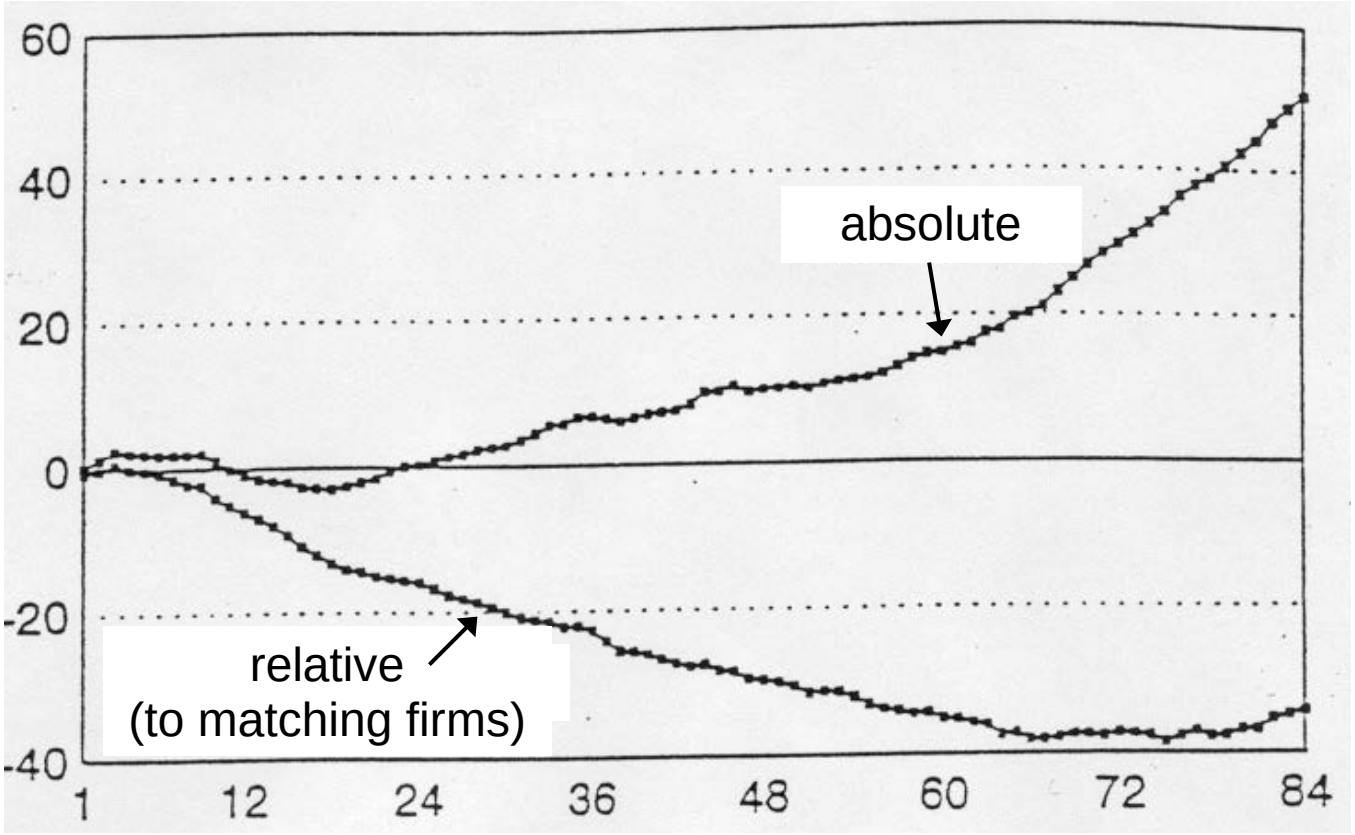
(a) International evidence:

Country	Author(s)	IPOs	Period	**Performance (3 years, %)**
Australia	Lee, Taylor, Walter	266	1976-89	**-46.5**
Austria	Aussenegg	57	1984-93	**-27.3**
Brazil	Aggarwal et al.	62	1980-90	**-47.3**
Canada	Jog, Srivisrava	216	1972-93	**-17.9**
Chile	Aggarwal et al.	28	1982-90	**-23.7**
Finland	Keloharju	79	1984-89	**-21.1**
Germany	Ljungqvist	145	1970-90	**-12.1**
Japan	Cai, Wei	172	1971-90	**-27.0**
Korea	Kim, Krinsky, Lee	99	1985-88	**+2.0**
Singapore	Hin, Mahmood	45	1976-84	**-9.2**
Sweden	Loughran, Ritter, Rydqvist	162	1980-90	**+1.2**
UK	Levis	712	1980-88	**-8.1**
USA	Ritter	8,061	1980-2014	**-17.8* (-6.3**)**

* Market adjusted; ** Matching firm adjusted (Size, Book-to-Market)

- **Long-Run Underperformance (USA)**

Performance in %



Months after the IPO

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(b) Long-Run Performance Measurement

- **Starting point:** a suitable benchmark
  - Possibility 1: Matching firms
    Non-IPO, industry, size
  - Possibility 2: Stock market indices
    ↳ Problem: Indices contain IPOs
  - Possibility 3: Matching portfolios of Non-IPOs
    (e.g. size portfolios)

- **ex-ante implementable trading strategy**

  (a) On the first trading day: Buying IPO i, buying the benchmark of i

  (b) On trading day T: Selling IPO i, selling the benchmarks of i

❍ Buy-and-Hold Abnormal Returns (BHARs)

• Buy-and-Hold Returns (BHRs)

The BHR is a very common method to measure the long-run performance.

Advantage: BHRs are based on a realistic and ex-ante implementable trading strategy.

The BHR for firm *i* is defined as

$$BHR_{i,T} = (1+R_{i,2})\cdot(1+R_{i,3})\cdot\ldots\cdot(1+R_{i,T}) - 1 = \left[\prod_{t=2}^{T}\left(1+R_{i,t}\right)\right] - 1$$

where $R_{i,t}$ is the return of firm *i* on trading day *t*. The return on the first trading day ($R_{i,1}$) equals the initial return and is typically not considered in the long-run performance measurement.

- **Abnormal performance**: comparison of the buy and hold return (BHR) of IPO *i* and it's benchmark (*B,i*):

$$BHAR_{i,T} = BHR_{i,T} - BHR_{B,i,T}$$

- The **average BHAR** for a group of N firms is defined as:

$$BHAR_T = \frac{1}{N}\sum_{i=1}^{N} BHAR_{i,T}$$

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The mean BHAR can also be calculated in using the mean BHRs of the sample of *N* IPOs and corresponding group of benchmarks:

$$BHAR_T = \frac{1}{N}\sum_{i=1}^{N}\left(BHR_{i,T} - BHR_{B,i,T}\right)$$

$$BHAR_T = \frac{1}{N}\sum_{i=1}^{N}BHR_{i,T} - \frac{1}{N}\sum_{i=1}^{N}BHR_{i,T}$$

$$BHAR_T = BHR_T - BHR_{B,T}$$

where BHR_T is the mean BHR of the group of *N* IPO firms and $BHT_{B,T}$ the mean BHR of the group of corresponding benchmarks.

A positive (negative) BHAR can be interpreted as better (worse) performance of IPO firms (relative to their benchmarks).

- **Wealth Relative (WR)**

A second very often used measure to evaluate the relative long-run performance is the wealth relative (WR). For a portfolio of *N* firms:

$$WR_T = \frac{1+BHR_T}{1+BHR_{B,T}} \quad \text{or} \quad WR_T = \frac{\frac{1}{N}\sum_{i=1}^{N}\prod_{t=2}^{T}\left(1+R_{i,T}\right)}{\frac{1}{N}\sum_{i=1}^{N}\prod_{t=2}^{T}\left(1+R_{B,i,T}\right)}$$

A WR larger (smaller) than one means that IPOs experience on average a better (a worse) performance compared to the corresponding benchmark.

❍ Example: The first trading days (Austrian IPOs)

Aftermarket performance from the close on the first trading day till the end of the 6., 11. and 21. trading day (exclusive of Initial Returns):

	6. trading day	11. trading day	21. trading day
Average BHR(IPOs) (%)	2.14	2.62	2.24
Average BHR(Benchmark Portfolio) (%)	0.32	0.49	1.61
Wealth relative	1.02	1.02	1.01
Average BHAR (%)	1.82	2.12	0.63
t-statistic[(a)]	1.86	1.59	0.38
	(0.059)	(0.092)	(0.683)
Median BHAR (%)	0.27	0.11	-0.89
z-statistic[(b)]	0.61	0.12	-1.10
	(0.541)	(0.903)	(0.272)
No of IPOs with a positive BHAR	36	34	29
No of IPOs with a negative BHAR	31	33	38
No of IPOs total	67	67	67

[(a)] p-values in brackets. [(b)] Test statistic of the sign test (p-values in brackets).

❍ Example: Long-run performance of Austrian IPOs over the first 3 and the first 5 years of aftermarket trading (exclusive Initial Returns):

	3 years	5 years
Average BHR(IPOs) (%)	25.05	31.42
Geom. average p.a. (%)	7.74	5.62
Average BHR(Benchmark Portfolio) (%)	81.96	105.38
Geom. average p.a. (%)	22.08	15.48
Wealth relative	0.69	0.64
Average BHAR (%)	-56.91	-73.95
t-statistic[(a)]	-4.15	-3.14
	(0.001)	(0.002)
Median BHAR (%)	-35.91	-42.42
z-statistic[(b)]	-3.22	-3.78
	(0.001)	(0.000)
No of IPOs with a positive BHAR	14	12
No of IPOs with a negative BHAR	37	39
No of IPOs total	51	51

[(a)] p-values in brackets. [(b)] Test statistic of the sign test (p-values in brackets).

- **Example: Long-run performance of family-IPOs, Non-family-IPOs, Privatizations (Priv.) and other-IPOs over the first 5 years of after-market trading (exclusive of Initial Returns) in Austria:**

	Family-IPOs	Non-Fam.-IPOs	Priv.	Other-IPOs
Average BHR(IPOs) (%)	-19.69	110.64	152.03	88.36
Geom. average p.a. (%)	-4.29	16.07	20.31	13.50
Average BHR(Benchmark, %)	98.92	115.39	102.17	122.51
Geom. average (%)	14.75	16.59	15.12	17.35
Wealth relative	0.40	0.98	1.25	0.85
Average BHAR (%)	-118.60	-4.75	49.85	-34.15
t-statistic[(a)]	-6.12	-0.10	0.86	-0.62
	(0.001)	(0.961)	(0.426)	(0.723)
Median BHAR (%)	-51.56	-17.75	28.90	-25.88
z-statistic[(b)]	-4.13	-0.89	0.38	-1.39
	(0.000)	0.371	0.705	0.166
No of IPOs with a positive BHAR	4	8	4	4
No of IPOs with a negative BHAR	27	12	3	9
No of IPOs total	31	20	7	13

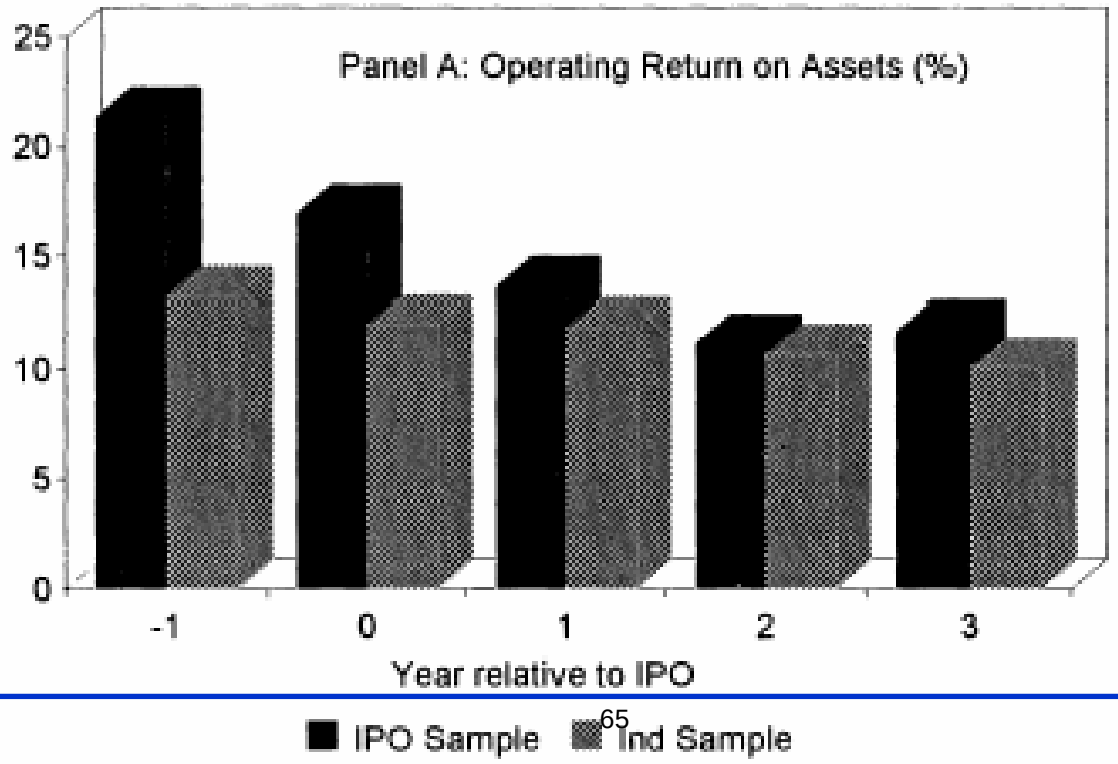
[(a)] p-values in brackets. [(b)] Test statistic of the sign test (p-values in brackets).

(c) Explanatory approaches for the long-run underperformance

❍ Windows of Opportunity

IPOs exhibit an **above-average operating performance** PRIOR and a **below-average operating performance** AFTER the IPO (Jain/Kini (1994, JF)

➔ Consequence: **worse long-run performance** on the stock market



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Earnings Management (Window Dressing)

- **Firms can manage earnings** (legally, to some extent)
  - by adopting **discretionary accounting accrual adjustments** that raise (lower) reported earnings relative to actual cash flows.

    Net Income = Total Accruals + Cash Flow from Operations

  - E.g. managers have discretion on **when** and **how much**
    - to **write off bad accounting receivables** or **impaired assets** or
    - to **invest** in **R&D**, or **maintenance costs**,
  - or have discretion on **accelerating** or **delaying** shipments of goods to customers at the end of a period to **affect the timing of revenues**

- Therefore:

  Managers can **raise (lower) current reported earnings** by taking **<u>income-increasing</u>** (decreasing) accrual adjustments now, but **<u>future</u> reported <u>earnings</u> will then be <u>lower</u>** (higher)!

- **Earnings Management** is therefore **only a <u>transitory</u> effect**!

- **Managers try to manage earnings especially**
  - **against losses**

    Managers are approx. twice as likely to lose their jobs in a year with a loss than in a year with positive earnings (Kaplan (1994))

  - **against earnings decreases**

    Smoothing of earnings ("bath" accounting), to decrease earnings volatility

  - **against negative earnings surprises**

    Hedging against litigation (Brown et al. (2001))

  - to **meet** special **thresholds**

    Analysts' forecasts (to meet or beat them), as analysts forecasts play an important role in determining (short term) stock prices.

- **to earn more money**

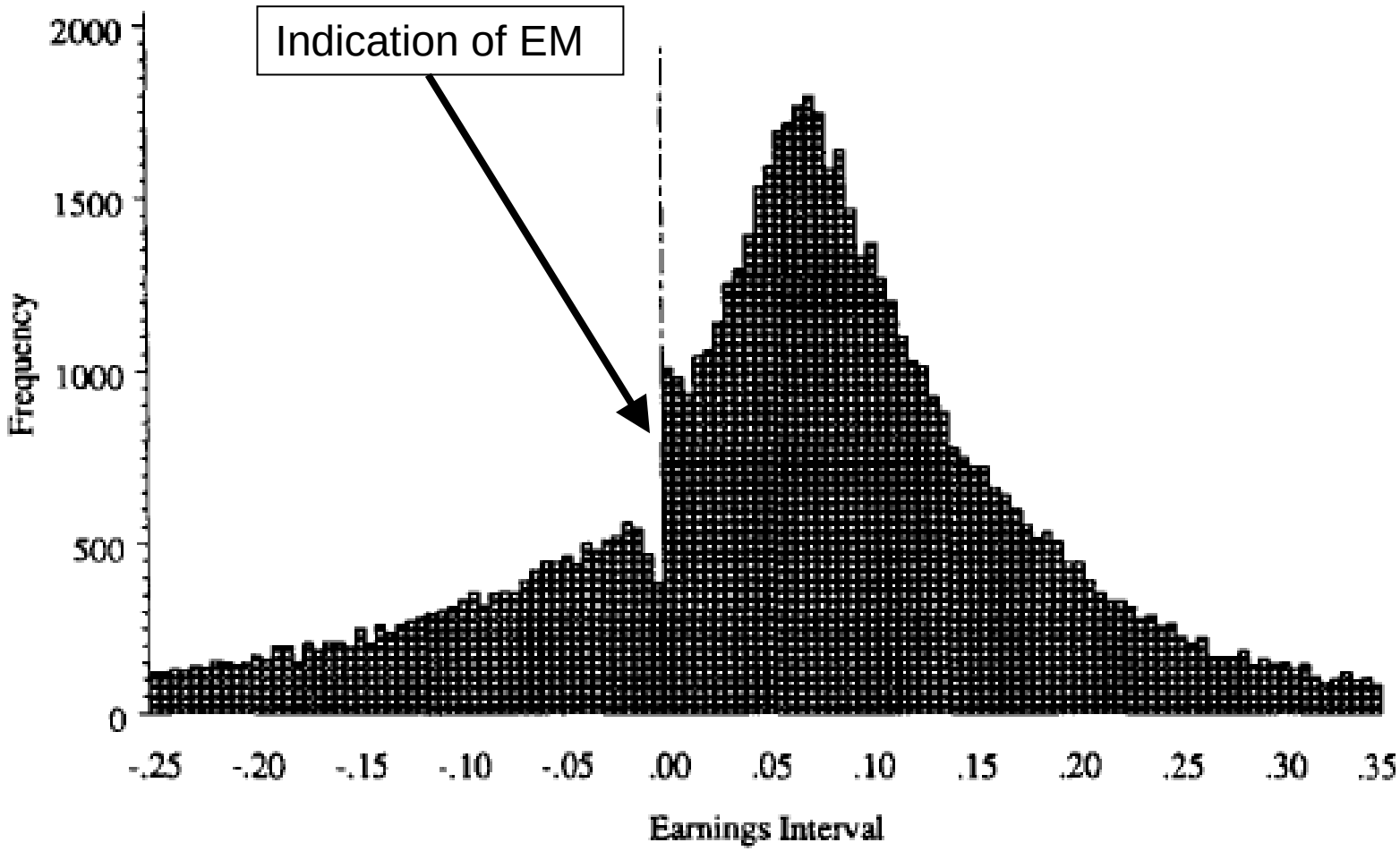
  E.g. stock options as a bonus provide strong incentives for managers to manage earnings

- To **reduce agency problems**: Managers

  - are forced to meet thresholds, or
  - are granted **stock options**

➔ Might lower agency costs, but generates **incentives for Earnings Management (EM)**

- **Example:** Too low frequency of small losses in case of EM



Burgstahler and Dichev (1997, Fig. 3)

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- **IPOs (Initial Public Offerings)**
  - **Teoh, et al. (JF, 1998):**

    Also IPO firms have the opportunity to **manage earnings** by applying discretion in accounting rules.

    If **investors use accounting numbers to value an IPO**, they might be **ready to pay a price** at the initial offer that is possibly **higher than the "true" value** of the firm.

    If investors **over time recognize** that the earnings performance is **below their expectations**, they will **correct their assessment**, resulting in a **negative long-run** performance.

    Window dressing hypothesis: the **price correction** should be **more pronounced** for IPO firms **more aggressively** managing their earnings prior to the IPO.

➔ The amount of EM predicts the post-IPO long-run performance.

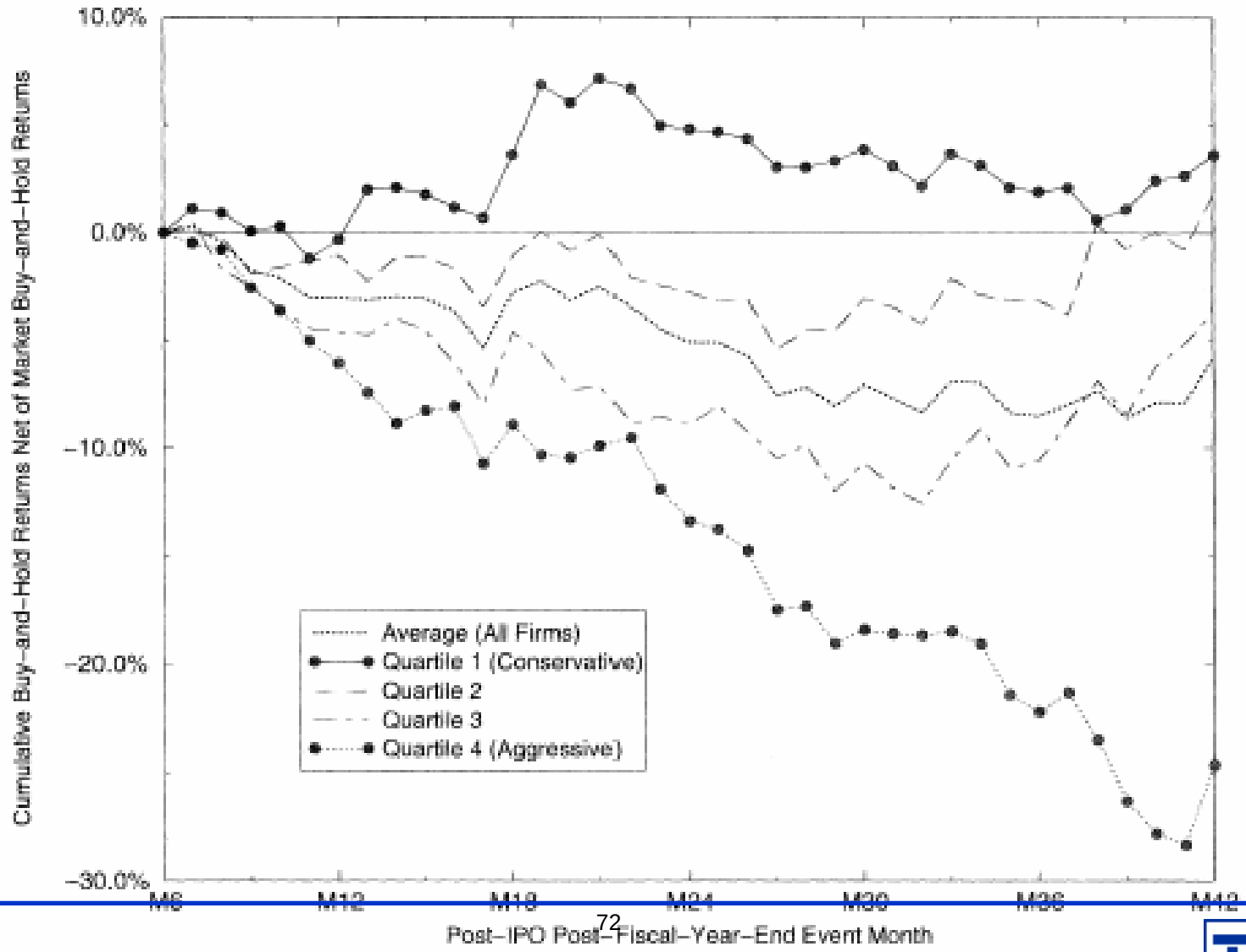

Figure 2. Cumulative buy-and-hold return net of Nasdaq composite index return DCA quartiles by event month, in percent. The sample is of 1,649 IPOs from the 1980–92

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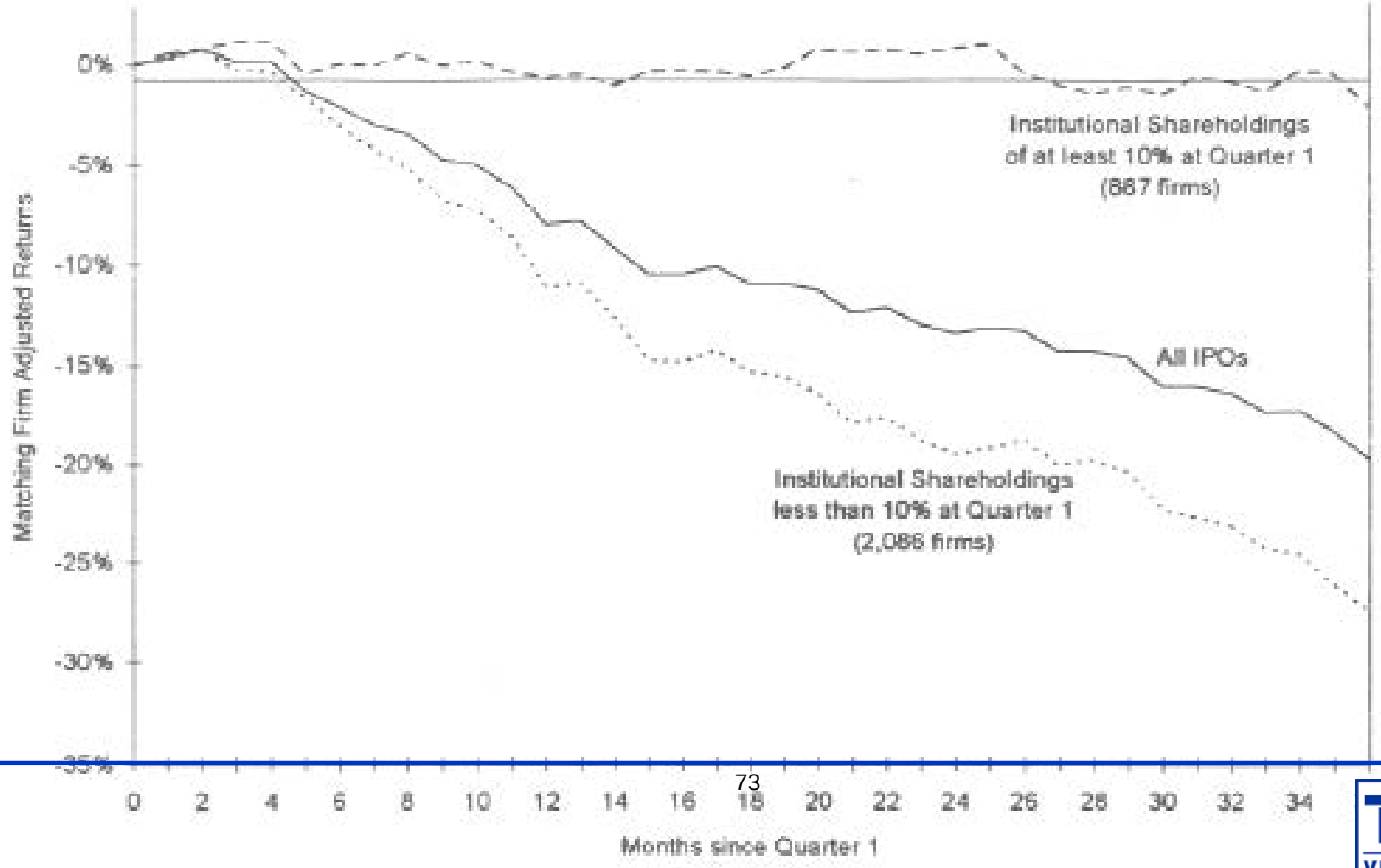
❍ Agency Problems

Firms with a weak ownership structure (less "big" investors, bad monitoring) have a worse long-run performance (Field, 1995).



6. Concluding Remarks

- There are **many reasons** why a going public can be favorable for a firm.
- Going public is a **long, time-consuming**, and **expensive process**.
- On average one can observe: **<u>positive</u> initial returns** for investors
  - Hedging against law suits
  - Price stabilization
  - Informational rents to institutional investors
- On average one can observe: **<u>negative</u> long-run performance**
  - Windows of opportunities
  - Earnings management (window dressing)
  - Ownership structure

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