European University Studies

Armin Höll-Steier

Venture Capital

Fund Certification, Performance Prediction and Learnings from the Past

PETER LANG

This book contains three studies. The first study investigates the relationship between private equity investors and fund managers and how intermediaries can mitigate their agency problems. The incentive structure of three intermediary types and their behavior in signaling fund qualities to investors are studied theoretically. A recommendation which intermediary to consult is given. The second study presents a new statistical method to predict the performance distribution of venture capital direct investments. The accuracy of this method is investigated and compared to existing approaches. The third study is about the European venture capital market's historic development before and after the internet bubble and reasons for the bad development especially after the bubble.

Armin Höll-Steier, born in 1980 in Munich; Master of Business Administration at Ludwig-Maximilians-University (LMU) Munich and master-level studies at the Center for Digital Technology and Management (CDTM) at LMU und Technical University Munich 2000–2004; work-related period of residence in Australia 2004–2005; employment at the strategy advisory Bain & Company since 2005; Master of Business Research in 2009 and doctorate degree (Dr.oec.publ.) at LMU Munich in 2010.

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"The quest for wisdom starts with the genuine desire to learn."

The Bibel

Every thesis starts with a desire, the desire to wander an unknown and arduous path of learning towards a blurry goal in the future. This path has many crossings, some are misleading and need to be walked back, some are rocky or steep and hard to conquer, only few passages are easy to pass. On this journey other people are waiting on the roadside and support the wanderer to fulfil his quest - some are continuous supporters and encouragers and some just guide the wanderer for a while or give advice for which direction to take. Unless the final goal is clear and the wanderer has enough stamina he will reach his destination. But in the end he will realize that it was not the end of the journey that provides pleasure but what he experienced on his way and the individuals he met, the discussions he had which were most enjoyable.

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Acronyms

AIC	Akaike Information Criterion
BCI	Business Climate Index
BCPE	Box-Cox Power Exponential
BO	Buyout
BVCA	British Venture Capital Association
CAPM	Capital Asset Pricing Model
CEPRES	Center for Private Equity Research
CPV	Credit Portfolio View
CREM	Credit Risk Evaluation Model
EVCA	European Venture Capital Association
GAMLSS	Generalized Additive Model of Location, Scale and Shape
GDP	Gross Domestic Product
GP	General Partner
IPO	Initial Public Offering
IRR	Internal Rate of Return

LP	Limited Partner
M&A	Mergers and Acquisitions
MCS	Monte Carlo Simulation
MIRR	Modified Internal Rate of Return
NASDAQ	National Association of Securities Dealers Automated Quotations
NAV	Net Asset Value
OLS	Ordinary Least Square
PE	Private Equity
PME	Public Market Equivalent
SBC	Schwarz Criterion
TVE	Thompson Venture Economics
TVPI	Total Value to Paid-In
USA	United States of America
USD	United States Dollar
VC	Venture Capital
VIF	Variance Inflation Factor

Nomenclature

Symbols of Chapter 2

η	A lead investor's share in a private equity fund
γ	Share of good funds in the market
$\gamma^*(p)$	Market clearing share of good funds for a given quality detection skill level
γ_{max}	Share of good funds in the market when placement agents or lead investors support the fund management as good as possible
γ_{min}	Share of good funds in the market when placement agents or lead investors do not support the fund management
$\hat{p}_{max}$	A monopoly certifier's skill level to correctly identify a fund management's quality
A	Financial return/surplus of a private equity fund
d	A single fund's probability to get a certificate
$d(p, \gamma)$	A single fund's probability to get a certificate at a given probability to correctly identify a fund management's quality and a given share of good funds in the market
E_I	Investors' return/surplus from a private equity fund investment
e_I	An investor's expected return from a private equity fund standardized by the extent of the fund surplus

E_{PEF}	Compensation of private equity fund management
e_{PEF}	A fund management's expected return from a private equity fund standardized by the extent of the fund surplus; equals a fund's probability to get a certificate
k	A lead investor's collusion payments standardized by the extent of the private equity fund surplus
p	Probability to correctly identify a fund management's quality
p'_{max}	Second best certifier's skill level to correctly identify a fund management's quality
$p^* = p^*(\gamma)$	Market clearing detection skill level for a given share of good private equity funds in the market
p_{max}	A certifier's skill level to correctly identify a fund management's quality
p_{min}	Investors' minimum requirement for a certifier's quality detection skill
Q	Ratio between reputation gain from investors and from private equity funds
R	Reputation of a certifier
R^{std}	A certifier's total reputation gain standardized by reputation gain from private equity funds
$R_{I,b}$	A certifier's reputation loss/threat from investors for identifying a badly performing fund
$R_{I,g}$	A certifier's reputation gain from investors for identifying a well performing fund
R_I	A certifier's total reputation gain from investors

R_I^d	A certifier's total reputation gain from investors in a capital over-demand situation
R_I^s	A certifier' total reputation gain from investors in a capital over-supply situation
R_{PA}	A placement agent's total reputation gain
$R_{PEF,b}$	A certifier's reputation loss/threat from fund managers for not certifying a fund
$R_{PEF,g}$	A certifier's reputation gain from fund managers for certifying a fund
R_{PEF}	A certifier's total reputation gain from private equity funds
R_{PEF}^d	A certifier's total reputation gain from private equity fund managers in a capital over-demand situation
R_{PEF}^s	A certifier' total reputation gain from private equity fund managers in a capital over-supply situation
R_{RA}	A rating agency's total reputation gain
s	Share of funded private equity funds that leads to market clearing
W	Compensation of a certifier for his service
W_C	Carried interest payments which a placement agent gets for his support in the fundraising of recommended private equity funds that get capital from investors
W_F	Fixed amount which a placement agent gets for his support in the fundraising of recommended private equity funds that get capital from investors
W_{LI}^C	A lead investor's compensation with collusion payments

w_{LI}^{C}	A lead investor's compensation with collusion payments standardized by the extent of the private equity fund surplus
W_{LI}^{NC}	A lead investor's compensation without collusion payments
w_{LI}^{NC}	A lead investor's compensation without collusion payments standardized by the extent of the private equity fund surplus
W_{PA}	A placement agent's compensation for his service
W_{RA}	(Fixed) compensation of a rating agency for its service
x	Share of well performing funds of recommended funds
y	Share of badly performing funds of recommended funds
z	Total number of (blindly) certified private equity funds

Symbols of Chapter 3

β	vector indicating the influence of covariates on a dependent variable
δ	probability of default within a group of investments
ϵ	normal distributed regression residual with mean 0 and constant variance
λ	Box-Cox transformation parameter
μ	centrality parameter in GAMLSS regression resp. median of BCPE distribution
ν	skewness parameter in GAMLSS regression
BCPE()	Box-Cox power exponential distribution function
E()	expected value of a variable
F()	distribution function of a return measure (IRR or MIRR)

P()	function that returns a probability
π	probability of default of an investment
σ	scale parameter in GAMLSS regression
τ	kurtosis parameter in GAMLSS regression
c	(positive and negative) cashflows
CFI	cashflows from a fund to a portfolio company
CFO	cashflows from a portfolio company to a fund
d	function of an investment's duration
G	MIRR distribution of a fund
g	MIRR distribution
h	share of committed capital of a fund invested in a year
I	duration of the investment period of a fund
i	index of an individual investment
IRR	internal rate of return of an investment
j	index of a group of investments
k	number of covariates describing an investment
l	index of an investment which did not default
m	number of covariates describing a group of investments
$MIRR$	modified internal rate of return
n	total number of investments
o	number of independent observations in GAMLSS

p	return measure (IRR or MIRR)
q	index of a group of investments a new investment belongs to
r	market return resp. return that an investor gets when investing capital in his investment alternative to a Venture Capital fund
s	index of a new investment
T	maturity of an investment or a fund
t	time index
U	total multiple of all investments over the whole lifetime of a fund
u	multiple of an investment over the whole lifetime of a fund
w	dummy variable indicating if an investment defaulted (value=1) or not (value=0)
x	vector of covariates
y	vector of a dependent variable with investment returns
z	vector of the covariates for a group of investments

Symbols of Chapter 4

c	(positive and negative) cashflows
IRR	internal rate of return of an investment
NAV	net asset values of unrealized and/or partially realized investments
T	maturity of an investment or a fund
t	time index