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ARGENTUM CENTRE for PRIVATE EQUITY

Newsletter

Autumn 2015

This is the second edition of the Centre's bi-annual newsletter. The mission of the Argentum Centre for Private Equity at the Norwegian School of Economics is to deliver high quality Private Equity research. To that aim we support research projects at NHH directly and are building a pan-Nordic PE database. The main topic of this newsletter will be return measurement in Private Equity.

Carsten Bienz
Centre Director

IN MEMORIAN: OLE MELBERG

Ole Melberg passed away this spring and I would like to take the opportunity to remember him. He served on the board of the PE Centre from 2012 and was a strong supporter of the Centre. We miss his contribution.

Picture: Ole Melberg in 2012

ANNOUNCEMENTS

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The Argentum Private Equity Centre will host a practitioners seminar by Juanita Gonzalez Uribe (London School of Economics) on "Accelerators: lessons from Chile" in late October in Oslo.

The Argentum Private Equity Centre and Jan Mossin's Memorial Fund (Minnefond) will host a practitioners' conference on Private Equity and Asset Allocation at NHH in Bergen on 15 December. Confirmed speakers are Morten Sørensen (CBS and CBS) and David Robinson (Duke).

Research Focus: Performance Measurement

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In this newsletter I want to continue to look at recent research on PE and its implications for the PE industry.

In the last newsletter we focused on return predictability. The focus of this newsletter is on return measurement in Private Equity. Maybe the most contentious question about return measurement in PE is how to adjust for the specific types of risk taken in Private Equity.

THE STATE OF THE ART – OR WHAT DOES NOT WORK

How can we measure the performance on an investment?

To do this we need to use the **net present value** (NPV) criterion. The NPV criterion takes the project's cash flows and divides it by an interest (or discount) rate from which we subtract the investment cost: $NPV = -I + CF/(1 + r)$. We have earned money if the difference is larger than zero.

The discount rate is central to getting this calculation right. It has two functions. Firstly, it corrects for the time value of money. Tomorrow's money is (usually) worth less than today's money. Secondly, it corrects for the risk of the investment: the higher the risk, the higher the discount rate. The risk correction can be computed from the **beta** of the project.

How can we find the beta of a project? We begin by computing a project's return. In order to do so, we need to have the valuation of the project at specific points in time. A return is then the difference between two valuations. We can compute many returns to get a return series. The variability of the return series gives us a first idea about the absolute risk of a project. Some of this risk can be diversified away by investing into multiple projects so we are only interested in the part we cannot remove.

This part can be measured by looking at the correlation between the project's return series and the return on the (stock) market.

The less the project's return changes given a change in the stock market index the safer the project and the lower the discount rate. In order to be able to do this computation we need to have reliable valuations on a frequent basis, i.e. daily or weekly. We usually scale the correlation by the variability of the stock market index to get a project's beta. This procedure is widely known as the CAPM.

In private equity we cannot measure the correlation between the project and the stock market index for three reasons. Firstly, firms are private by their nature so there exists no market price. Secondly, the valuations we receive for each firm are subjective valuations and may contain various biases. We therefore cannot compute a risk correction easily and we cannot use the NPV criterion. Thirdly, we don't receive these valuations frequently enough. Public firms are traded continuously and hence it is easy to compute their beta.

Investors often ask the following question instead. Which discount rates equates my cash flows with my investments? In its simplest form it merely is the r in the following equation: $Investment\ =\ Cash\ Flow/(1 + r)$. Note that we do not ask the question about the project's risk. Instead, we ask which rate of return did the project achieve. This method is called the Internal Rate of Return (IRR). This is a far from ideal situation. For example, IRRs can be blown up by having a couple of early dividends ("re-caps" in PE lingo). Also, IRRs can be blown-up by increasing project risk through leverage.

SO WHAT CAN WE DO?

We can try to measure returns at different levels: the industry as a whole, the LP or GP level, and the individual deal level. Each requires a different approach and I will try to outline where research frontier stands in each case. Let me start with the industry at whole.

Industry level

Some attempts have been made to measure risk and return at an aggregate level for PE. I want to briefly look at three recent papers: Kortweg and Sørensen (RFS, 2010), Phallipou et al (JFQA, 2013) and Phallipou et al (2015).

Kortweg and Sørensen build a statistical model to correct for the shortcomings of the standard approach mentioned above and attempt to estimate a beta for VC investments.

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"The VC industry on average has a beta of about 2.3 and a negative alpha."

Their results are listed in table 2 and show that the VC industry on average has a beta ("Market-β" in the table) of about 2.3 and a negative and statistically significant alpha ("Intercept" in the table)[1]. What does that mean? Basically, if the Oslo Stock exchanges main index gains 1 kroner in value, VC investments gain 2.3 kroner and vice versa. A 1 kroner loss for the main index therefore translates into a 2.3 kroner loss. This is a lot, as the average firm on the Oslo Stock exchange will have a 1 kroner movement. A negative alpha is even more worrisome as it means that the industry is systematically not earning enough to compensate investors for the risk they take.

Phallipou et al (JFQA, 2012) and Phallipou et al (2015) use different assumptions to build a statistical model that allows them to estimate the risk and return of both buyouts and venture and find that buyout betas are around between 1.3 and 1.7. Their estimates of venture betas are similar to Korteweg and Sørensen. In robustness tests buyout betas vary substantially, indicating the difficulties inherent in the estimation procedures.

	Table 1: Estimates of Private Equity Betas		
	Korteweg/Sørensen	Phallipou et al.	
	VC with selection correction	VC	Buyout
Intercept	-0.0538***	0.0074*	-0.097
	(0.0018)	(0.41)	(0.70)
Market-β	2.2972***	2.37***	1.71***
	(0.1140)	(0.55)	(0.65)

What can we use this information for? It should allow LPs to understand the overall risk and return properties of PE investments. This understanding should allow them to estimate the opportunity cost of capital of investing into PE.

Secondly, we should not use these numbers to try to estimate risk-adjusted rates of return for a given GP. The parameters estimated reflect the risk of all PE investments made, regardless of sector, strategy, fund quality or access. LPs will typically have much more discerning investment strategies.

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[1] If a variable is statistically significant from zero than we can be sure that the coefficient is not just randomly different from zero.

LP Level

But then how can we try to measure risk and return, in particular at the fund or LP level? In their 2005 paper in the Journal of Finance, Kaplan & Schoar, proposed to use the public market equivalent. Their idea is to compute how much an LP would have earned in the public market relative to the PE investment. To do so they compare the returns paid to investors with the capital paid in, with both payments discounted by the return of the S&P 500.[2] The idea is to use the S&P 500 as an opportunity cost. That implies that we assume the beta of private equity to be equal to one.

> "PME is actually a very good measure for evaluating a GP's performance"

The question is then how good is this risk measure? In a 2013 working paper, Sørensen and Jagannathan (SJ) argue that the PME is actually a very good measure for evaluating a GP's performance. SJ show that using the PME can be justified by resorting to a different asset-pricing model than the standard CAPM.[3] The assumptions required to apply the PME are in a sense more realistic than the assumptions of the standard CAPM. SJ also show that the PME is difficult to manipulate through the use of leverage, a large bonus given the prevalence of leverage in buyout investments.

> "KS PME should be the prime measure to be considered"

What are the limitations? The PME assumes that an LP's rate of return is similar to the markets return. Large PE allocations will change the LP's portfolio and hence this assumption can be violated. Another practical issue will be the integration of the PME into an existing asset allocation as it is based on different assumptions.

What about the other types of PME measures that were recently mentioned in Prequin's report on PME benchmarking? In my opinion, both other measures should be seen as extensions of the IRR methodology. Given the good theoretical properties and the ease of computation, I think the KS PME should be the prime measure to be considered.

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[2] The Public Market Equivalent is then defined as:

$$PME = \frac{\sum_{t=1}^{T} \frac{Distributions_t}{1+r_{M,t}}}{\frac{\sum_{t=1}^{T} Calls}{1+r_{M,t}}}$$

[3] The assumptions are: *"(1) markets are frictionless and the "law-of-one-price" holds; (2) the LP has log utility (…); and (3) the return on the LP's total wealth portfolio equals the return on the public market."*

Deal Level

Finally, some papers have attempted to measure risk and return at the deal level by comparing listed firms to LBO transactions. For Norway, Bienz, Thorburn & Walz (BYW) find that asset-betas for LBO deals are around .34.[4] This asset beta estimate can be used to find risk adjusted discount rates for individual deals, provided that the leverage ratio is known.[5] One shortcoming of this method is that it does not allow for the estimation of portfolio risk, as it does not take into account the correlation between different cash flows at the fund level.

Summary

We have seen that due to data issues it is extremely difficult to properly measure risk and return in the PE industry, even at the aggregate level. At the aggregate level, the current state of the art suggests that the PE industry has high betas and there is little evidence of positive alpha. Such a finding should make potential LPs wary. Of course, this does not mean that individual GPs do not generate positive alpha. Rather, it points out the importance of selecting the right GP.

The industry has responded by using different types of shortcuts

Measuring returns at the individual GP level suffers from severe data limitations. The industry has responded by using different types of shortcuts but often these shortcuts lead to systematic biases in decision-making. For example, high IRRs might be used as justification for PE investments without pointing out that the risk inherent in the asset class cannot be captures by such a measure. A recent innovation in return measurement is Kaplan and Schoar PME measure. This measure reduces some of biases inherent in IRRs and should be adopted as a complement measure for GP returns.

References:

Carsten Bienz, Karin Thorburn, and Uwe Walz, *"Coinvestment and risk taking in private equity funds"*, Working Paper, 2015. (Available upon request)

Steven Kaplan and Antoinette Schoar, *"Private Equity Performance: Returns, Persistence, and Capital Flows"*, Journal of Finance, 2005.

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[4] Asset betas are betas that are corrected for financial risk (leverage). Asset betas reflect the business risk of an investment. Normal betas (or equity betas) reflect the total risk of an investment, including financial risk.
[5] I will come back to this in the next newsletter and show an example of how to do this.

References (continued):

Arthur Korteweg and Morten Sorensen, *"Risk and Return Characteristics of Venture Capital-Backed Entrepreneurial Companies"*, Review of Financial Studies, 2010.

Joost Driessen, Tse-Chun Lin, and Ludovic Phalippou, *"A New Method to Estimate Risk and Return of Nontraded Assets from Cash Flows: The Case of Private Equity Funds"*, Journal of Financial and Quantitative Analysis, 2012.

Andrew Ang, Bingxu Chen, William N. Goetzmann, and Ludovic Phalippou, *"Estimating Private Equity Returns from Limited Partner Cash Flows"*, Working Paper, 2014. (Available at ssrn.com)

Morten Sørensen and Ravi Jagannathan, *"The Public Market Equivalent and Private Equity Performance"*, Working Paper, 2013. (Available at ssrn.com)

Centre in the Press

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Carsten Bienz and Aksel Mjøs published a feature article in Aftenposten on 30 April that discusses the impact of the wealth tax on firms' propensity to go public. The article can be found here.