Drivers of risk for investors in secondary funds

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Introduction

The private equity secondary market has witnessed significant growth in the past decade. This is largely due to the sizeable volume of commitments made to primary funds, combined with portfolio reshaping by private equity investors. The growth trajectory has been accelerated in recent years by financial institution asset sales for regulatory and capital reasons.

Active risk management has become increasingly important for many private equity investors. This paper investigates the key drivers of risk for investors in secondary funds. These include:
1. Fund age (i.e. stage of primary fund's life when secondary fund makes acquisition)
2. Acquisition structure (i.e. secondary market purchase price and investment structuring)
3. General Partner's underlying fund quality (i.e. quartile of primary fund acquired by secondary fund)
4. The economic cycle (i.e. stage of cycle when secondary fund acquires primary fund)

Our study uses Preqin's[1] performance data of 718 global buyout funds with 1980 to 2013 vintages. The dataset contains detailed cash flows and net asset values (NAVs) and can be considered the universe of primary funds that secondary acquirers target. Thus, the data can be used to simulate the risk of making secondary fund investments for each driver.

Key research findings:

- Secondary funds targeting tail-end funds have higher risk than those targeting younger funds;
- Investors acquiring a preferred equity position in funds with a structured investment approach decrease risk versus investors in traditional secondary funds;
- There is an intuitive relationship between the performance quartile of the General Partner and secondary fund risk;
- Secondary fund risk is impacted by the stage of the economic cycle at which a primary fund is acquired.

[1] Preqin. Private Equity Intelligence provides performance data for the alternative assets' industry.

Defining and measuring risk

Defining risk

In order to understand what drives risk, it is necessary to define risk. For this, we reference the EVCA Risk Measurement Guidelines that were developed in January 2013. The Guidelines are a set of recommendations intended to represent current best practices for measuring the risk of investing in private equity funds. Specific risks include:

- Funding risk: The need for investors to make capital calls at short notice given the unpredictable timing of cash flows;
- Liquidity risk: The need for investors to sell on the secondary market given the illiquid nature of the private equity asset class;
- Market risk: The impact of public market volatility on the value of assets held in a private equity portfolio, as the portfolio is typically benchmarked against listed counterparts;
- Capital risk: The qualitative and quantitative factors (e.g. quality of fund manager, portfolio-company metrics, macro indicators) that impact the realisation of private equity investments.

While each of these risks should be considered by investors committed to primary funds, secondary fund investments are designed to structurally reduce the impact of funding and liquidity risk. This paper focuses predominantly on capital risk, and to some extent market risk, when assessing the drivers of risk for investors in secondary funds.

Measuring the risk of a private equity portfolio using the PERACS Risk Curve and Coefficient

In addressing the drivers of risk, this paper draws on the PERACS Risk Curve and Coefficient: a tool for investors to easily assess and compare the risk profile of their private equity portfolios. This is done by calculating how much profit each individual investment contributes to a portfolio – either by a particular currency or in terms of net present value (NPV).

Profit contribution = cash received by investors minus capital paid by investors

OR

NPV of profit contribution = present value of cash flows received by investors minus the present value of capital paid by investors

Based on this measure of profit contribution for each investment, a PERACS Risk Curve ***(figure 1)*** is constructed with the percentage of a portfolio's investments on the x-axis and the percentage of a portfolio's profits on the y-axis. Every point on the Curve corresponds to a performance statistic, such as 'the bottom 40% of the portfolio's investments represent 30% of the portfolio's profits'. The Curve is equivalent to the Lorenz Curve[2] used in economics.

If every investment generates the same profit (in absolute terms) then the Curve would be a straight line. In this case, the bottom 'N' % of investments would cumulatively always have 'N' % of the profits resulting in a straight line 'y' = 'x'. This is known as the 'line of perfect equality'. By contrast, the 'line of perfect inequality' would be where a single investment generates all the profits and the remaining investments generate no profit.

The area between the 'line of perfect equality' and the PERACS Risk Curve produces the PERACS Risk Coefficient. The higher the Coefficient the more unequal the profit distribution (i.e. 0 = perfectly distributed profit or lowest

[2] Lorenz Curve. Developed by Max Lorenz in 1905.

risk, 1 = perfectly concentrated profit or highest risk). The Coefficient is equivalent to the Gini Coefficient[3] used in economics.

For a population of size n, with a sequence of values y_i, i = 1 to n, that are indexed in non-decreasing order ($y_i \leq y_{i+1}$), the PERACS Risk Curve is the continuous piecewise linear function connecting the points (F_i, L_i), i = 0 to n, where $F_0 = 0$, $L_0 = 0$, and for i = 1 to n:

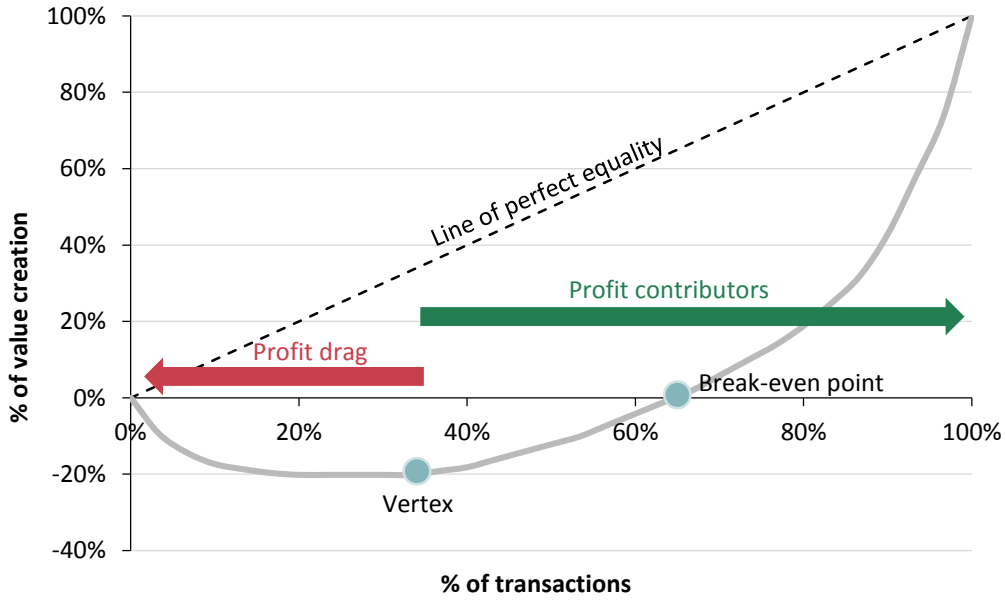
$$F_i = i/n$$
$$S_i = \Sigma_{j=1}^{i} y_j$$
$$L_i = S_i/S_n$$

A PERACS Risk Curve always starts at (0,0) and ends at (1,1). It is designed to be independent of the absolute amount of profits generated by the portfolio, so that it makes it possible to compare risk profiles of different private equity portfolios, independent of their returns.

If there are investments in a portfolio that generate 'profit drag' (i.e. cash received by investors is less than capital paid by investors), then the Curve will initially be downward sloping, at a decreasing slope, until it reaches the vertex. 'Profit contributors' (i.e. cash received by investors is greater than capital paid by investors) are represented by an upward sloping curve, at an increasing rate.

The longer the Curve the greater the proportion of investments required to reach break-even (y-axis = 0%), the point at which the portfolio is no longer loss making. The deeper the Curve below the break-even point the greater the proportion of loss-making investments, relative to profit-making investments. Overall, a more exponential shaped Curve indicates that profits are concentrated in a low number of investments. By comparing the PERACS Risk Curve for different private equity portfolios, investors can easily and intuitively assess and compare their portfolios' risk attributes.

Figure 1: PERACS Risk Curve and Coefficient of a typical private equity portfolio



Source: PERACS analysis

[3] Gini Coefficient. Developed by Corrado Gini in 1912.

Methodology and dataset

Our study uses Preqin's performance data of 718 global buyout funds with 1980 to 2013 vintages. The dataset contains detailed cash flows and net asset values (NAVs), which can be used to simulate the risk of making secondary fund investments for each of the drivers illustrated below.

For the purposes of the study, a simulated 2003-vintage secondary fund is used as a representative historical vintage to create a PERACS Risk Curve and Coefficient for each driver of risk. The fund has a typical four-year investment period (2003 to 2006), and targets primary funds that are between four to eight years old.

2003-vintage secondary fund investing over the following years:	Vintage years of primary funds acquired (4-8 years old)
2003	1996-1999
2004	1997-2000
2005	1998-2001
2006	1999-2002

As the secondary fund invests equally over its investment period, there will be four times more primary funds with a 1999 vintage in its portfolio than with 1996 or 2002 vintages. However, the 1999-vintage primary funds would have been acquired at four different points in time, always at the NAV at the transaction date. The secondary fund investor would realise cash flows from these primary funds until end-2013 – the end of the dataset's observation period. Any residual NAVs as of end-2013 are treated as a final cash inflow into the secondary fund.

We have also simulated the risk for 2001 to 2008-vintage secondary funds to ensure there is no selection bias in the 2003 vintage. 2009-vintage secondary funds and later have been excluded from the analysis as they are too young to produce meaningful results.

Drivers of risk for investors in secondary funds

Managers of secondary funds have four principal ways to influence their fund's risk:

1. Fund age (i.e. stage of primary fund's life when secondary fund makes acquisition)
2. Acquisition structure (i.e. secondary market purchase price and investment structuring)
3. General Partner's underlying fund quality (i.e. quartile of primary fund acquired by secondary fund)
4. The economic cycle (i.e. stage of cycle when secondary fund acquires primary fund)

Fund age, General Partner's underlying fund quality, and the economic cycle are relevant for all types of secondary fund investments. Acquisition structure illustrates the difference in risk for investors between traditional secondary funds and preferred equity funds.

1. Fund age

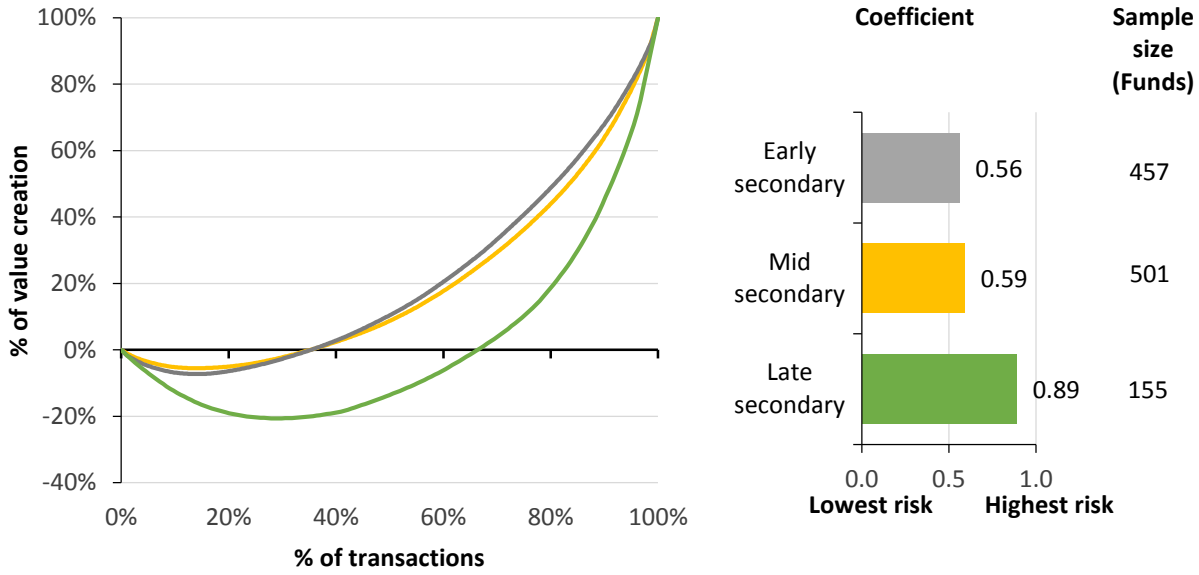
The age of a primary fund at acquisition has a meaningful risk impact for a secondary fund investor. To isolate its impact from the other three drivers, we simulate early, mid and late secondary funds, investing in all quartiles, and at par.

By way of definition, an early secondary fund targets primary funds that are up to three years old; a mid-secondary fund targets primary funds that are between four to seven years old; and a late secondary fund targets primary funds that are at least eight years old (i.e. tail-end funds). It is worth noting that as early secondary funds target primary funds that are typically still in their investment period they can exhibit features similar to primary funds.

Figure 2 illustrates how secondary fund risk increases with the age of primary funds targeted. A simulated 2003-vintage late secondary fund produces a Risk Coefficient of 0.89, substantially higher than both early and mid-secondary funds (0.56 and 0.59 respectively). ***Figure 3*** confirms this variation for 2001 to 2008-simulated secondary fund vintages, where a late secondary fund produces a median Risk Coefficient of 0.86 versus 0.64 for an early- and 0.68 for a mid-secondary fund. In practice, this means that for a late secondary fund the vast majority or all of the profits are derived from just a few investments.

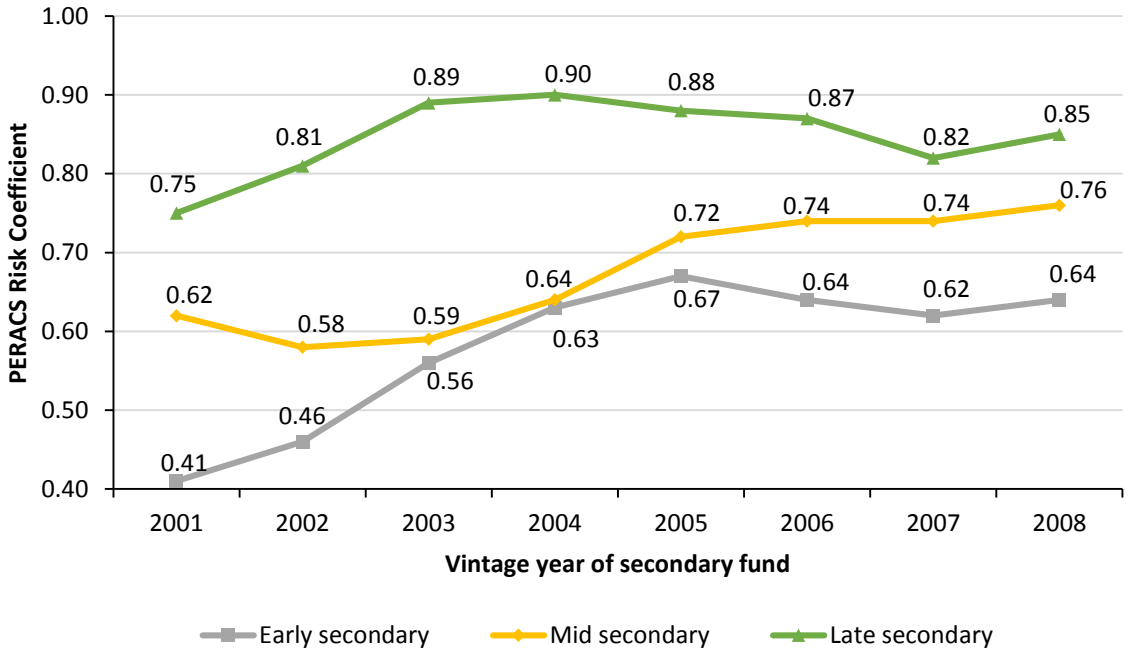
Intuitively, the J-Curve of a private equity portfolio influences risk. Therefore, late secondary funds exhibit the greatest risk as the differential between top and bottom-performing funds in a portfolio increases over time.

Figure 2: Impact of fund age: PERACS Risk Curve and Coefficient for 2003-vintage secondary fund*



*Early, mid, late secondary fund, investing in all quartiles, and at par
Source: PERACS analysis using Preqin data

Figure 3: Impact of fund age: PERACS Risk Coefficient, by vintage year of secondary fund*

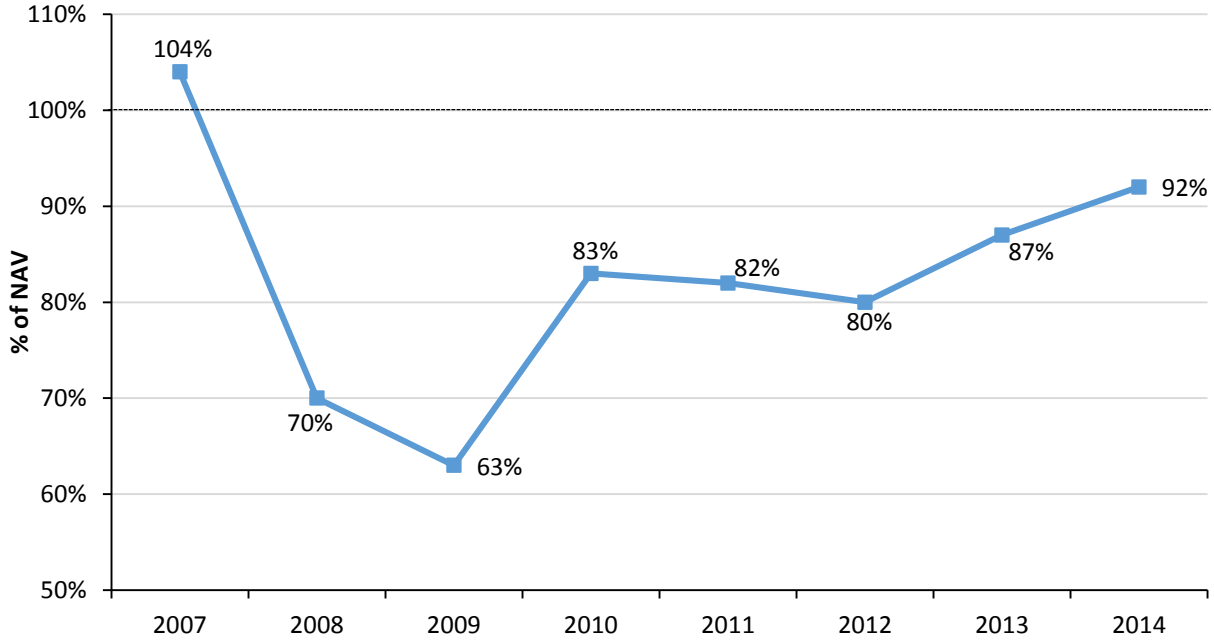


*Early, mid, late secondary fund, investing in all quartiles, and at par
Source: PERACS analysis using Preqin data

2. Acquisition structure

Intuitively, one would expect a lower acquisition price on the secondary market leads to a more advantageous risk profile, all things being equal. However, secondary fund investors have little influence over market prices, *per se*. Secondary market pricing has been fairly full since 2010, reaching close to par in recent years *(Figure 4).* In 2014, the average high bid for all fund types was less than a 10% discount to NAV[4]. Cogent Partners, a secondary market advisor, expects this to remain relatively unchanged in 2015. High pricing combined with significant uninvested capital make for a competitive secondary market.

Figure 4: Secondary market pricing – average high bid for all fund types



Source: Cogent Partners

That being said, structured transactions have particular characteristics that provide fund investors with a different risk-return profile. Specifically, a preferred equity fund would co-invest in an existing private equity portfolio with a senior preferred position, contractual return and priority on portfolio distributions.

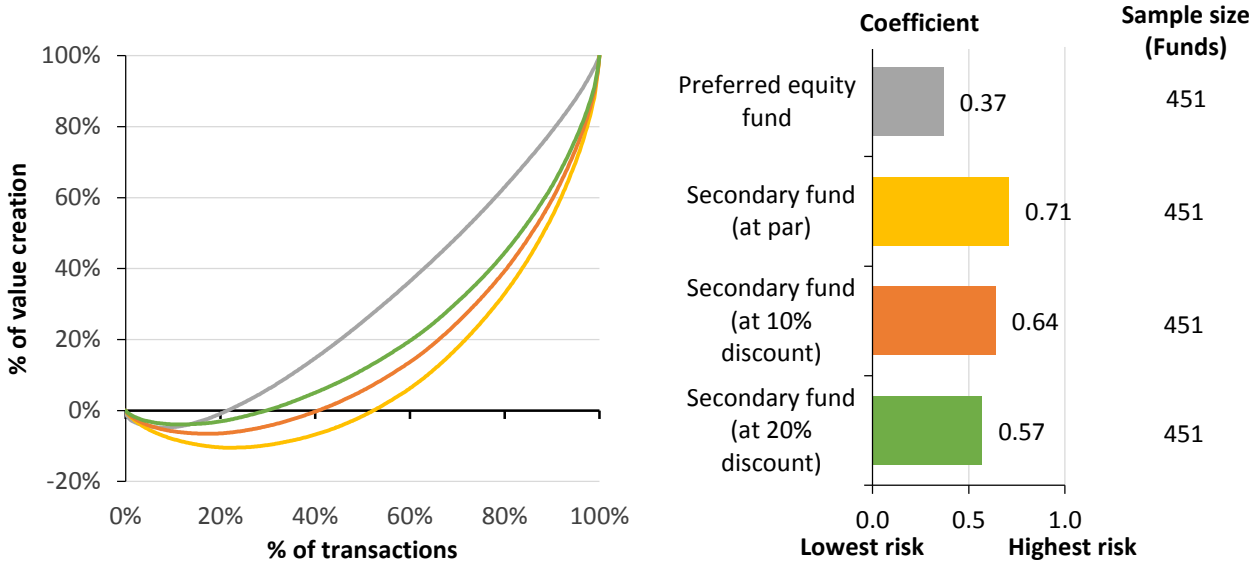
Using our simulation, we can assess the risk of preferred equity funding, where returns are allocated between the acquirer and counterparty. For illustrative purposes, we assume the following: an investment of 50% of NAV (2x asset cover), 100% of portfolio distributions to the acquirer up to a 1.4x multiple and 5% of distributions above this multiple. According to this structure, the counterparty would achieve immediate liquidity of 50% of the portfolio's NAV at the transaction date, and preserve a 95% share of the portfolio's future distributions (i.e. upside) once the 1.4x multiple has been surpassed.

We use the simulated 2003-vintage mid secondary fund to compare the risk of preferred equity funds with traditional secondary funds. Secondary pricing is flexed (par, 10% and 20% discount to NAV) to illustrate the impact on return dispersion. ***Figure 5*** shows that investors acquiring a preferred equity position in funds with a structured investment approach decrease risk versus investors in traditional secondary funds. This is true not only compared to a secondary fund buying at par, but even compared to a secondary fund buying at a 20% discount to NAV. Lower risk is typically combined with lower access to the portfolio upside. Hence, investors selling to preferred equity buyers keep a greater share of their portfolio's upside potential.

[4] Cogent Partners. Secondary Market Trends & Outlook, January 2015.

Preferred equity's lower Risk Coefficient means that profit is more perfectly distributed in the portfolio: the top 20% of transactions account for almost 40% of the portfolio's profits versus 70% for a secondary fund's investments, at par. Preferred equity also has a much earlier break-even point – the point at which the portfolio is no longer loss making – than a traditional secondary fund (23% vs. 53% of transactions). Even at a 20% discount to NAV, a secondary fund's simulated portfolio has a greater proportion of loss-making investments than a preferred equity fund's portfolio (30% vs. 23% of transactions).

Figure 5: Impact of acquisition structure: PERACS Risk Curve and Coefficient for 2003-vintage secondary fund*



*Mid-secondary fund
Source: PERACS analysis using Preqin data

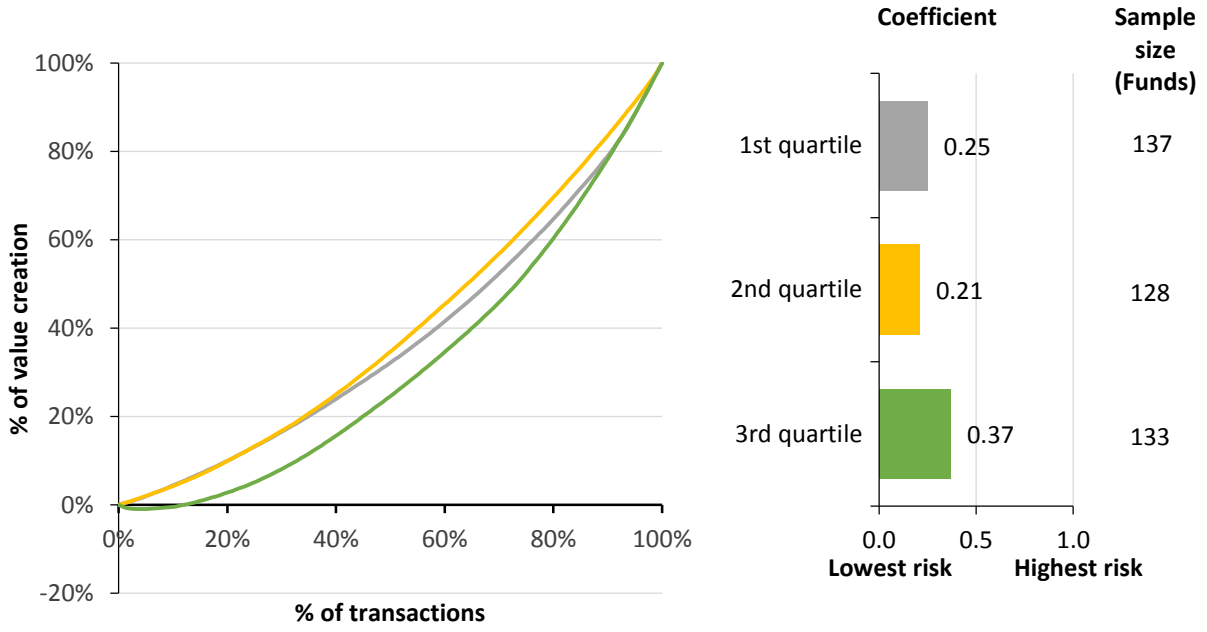
3. General Partner's underlying fund quality

A General Partner's underlying fund quality (i.e. quartile performance) is another intuitive determinant of the cash flows for a secondary fund and therefore, a key driver of their risk. To isolate its impact from the other three drivers, we simulate the risk of a mid-secondary fund (i.e. investing in primary funds that are between four to seven years old), investing at par. A fund's quartile is based on performance from the time of a secondary investment until maturity. This assumes perfect foresight by the secondary buyer.

Figure 6 shows that a simulated 2003-vintage secondary fund investing in top-quartile performing primary funds achieves a lower Risk Coefficient (i.e. more evenly distributed profits) of 0.25 versus 0.37 if the fund invests only in third quartile funds. Fourth quartile funds have been excluded for computational reasons, which explains why there is barely any profit drag in the simulated portfolio.

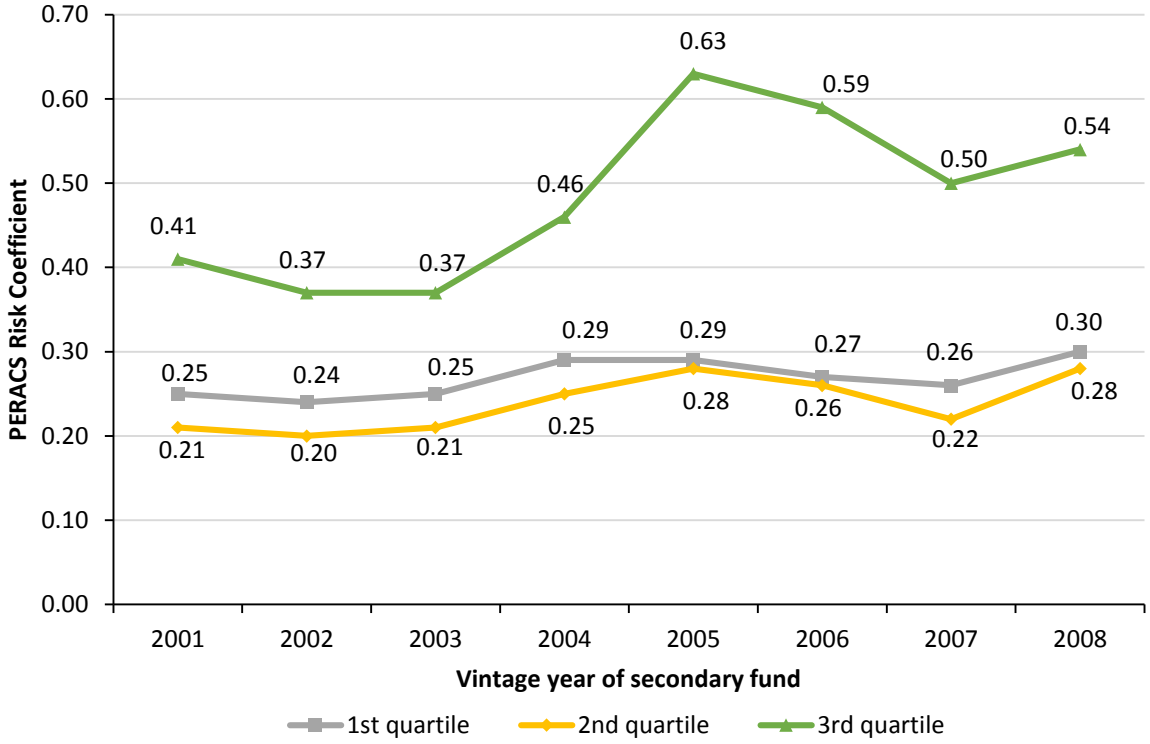
Figure 7 illustrates that a secondary fund selecting the best-performing primary funds (i.e. first and second quartiles) produces a median Risk Coefficient of 0.25 versus 0.48 for third quartile funds. In other words, the dispersion of returns (risk) for a subset of high-quality funds is lower than for third quartile funds. It is also worth noting that the first quartile has a slightly higher risk than the second quartile as it includes some funds that are performance outliers.

Figure 6: Impact of GP's fund quality: PERACS Risk Curve and Coefficient for 2003-vintage secondary fund*



*Mid-secondary fund, investing at par
Source: PERACS analysis using Preqin data

Figure 7: Impact of GP's fund quality: PERACS Risk Coefficient, by vintage year of secondary fund*



*Mid-secondary fund, investing at par
Source: PERACS analysis using Preqin data

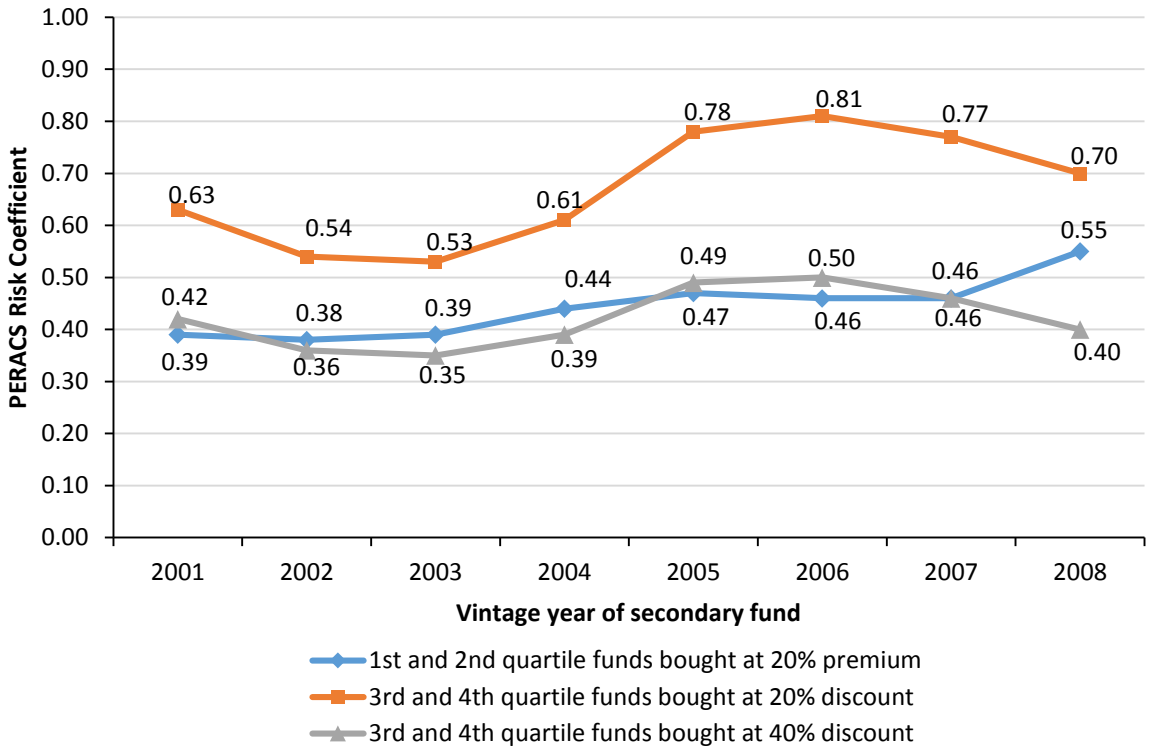
General Partner's fund quality versus pricing

While a General Partner's underlying fund quality is clearly an important driver of risk for secondary fund investors, real-world investors face a trade-off between fund quality and price paid in a transaction. In general, the performance of the underlying primary funds is, at least partially, reflected in the price paid for secondary fund stakes, as a function of the NAV at the time of purchase. In practice, lower quality funds (i.e. third and fourth quartile funds) can usually be bought at steeper discounts in the secondary market, and vice versa.

Figure 8 explores the fund quality-price trade-off from a risk perspective:

- First and second quartile funds bought at a 20% premium to NAV
- Third and fourth quartile funds bought at a 20% discount to NAV
- Third and fourth quartile funds bought at a 40% discount to NAV

Figure 8: Impact of GP's fund quality vs price: PERACS Risk Coefficient, by vintage year of secondary fund*



*Mid-secondary fund
Source: PERACS analysis using Preqin data

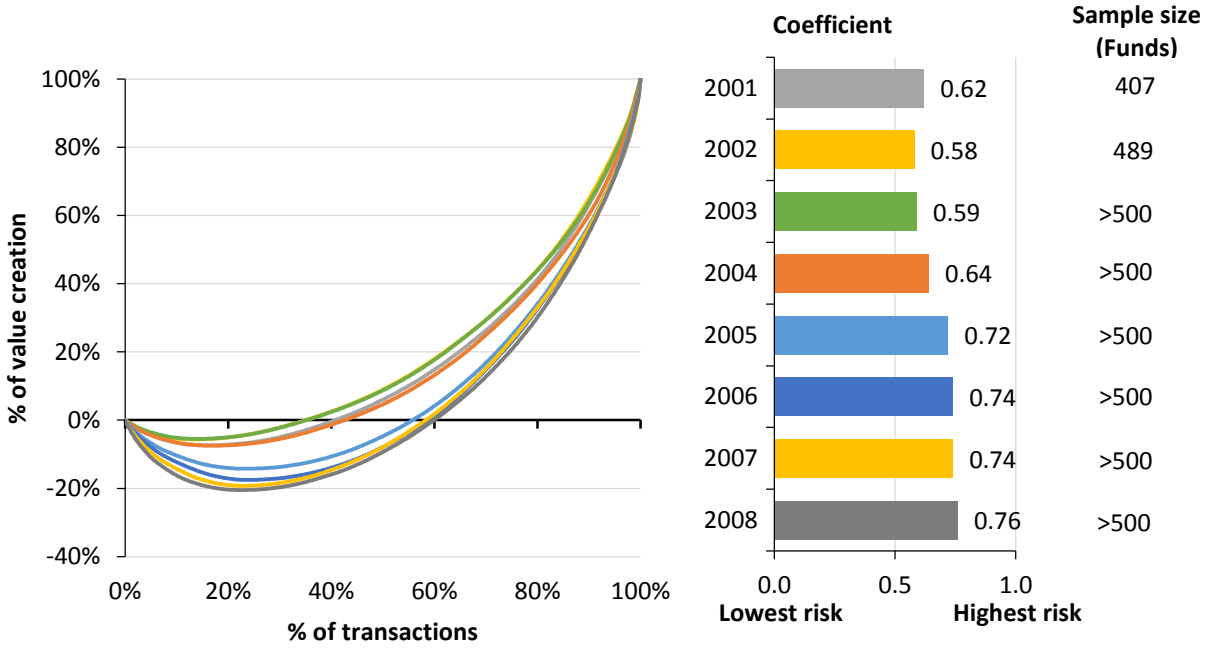
The results show that investing in better quality funds (i.e. first and second quartile funds), even at a 20% premium to NAV, turns out to be less risky than investing in third and fourth quartile funds at a 20% discount. In fact, according to our simulations, only at a 40% discount does a secondary fund investor acquiring lower quality funds lead to a Risk Coefficient comparable to investing in better quality funds at a 20% premium. The story is similar from a performance perspective: acquiring lower quality funds at a steep discount produces lower returns in the long-run than top-quality funds at a premium.

4. The economic cycle

Secondary fund risk is also impacted by the stage of the economic cycle at which a primary fund is acquired. To isolate its impact from the other three drivers, we simulate the risk of a mid-secondary fund (i.e. investing in primary funds that are between four to seven years old), investing in all quartiles, and at par.

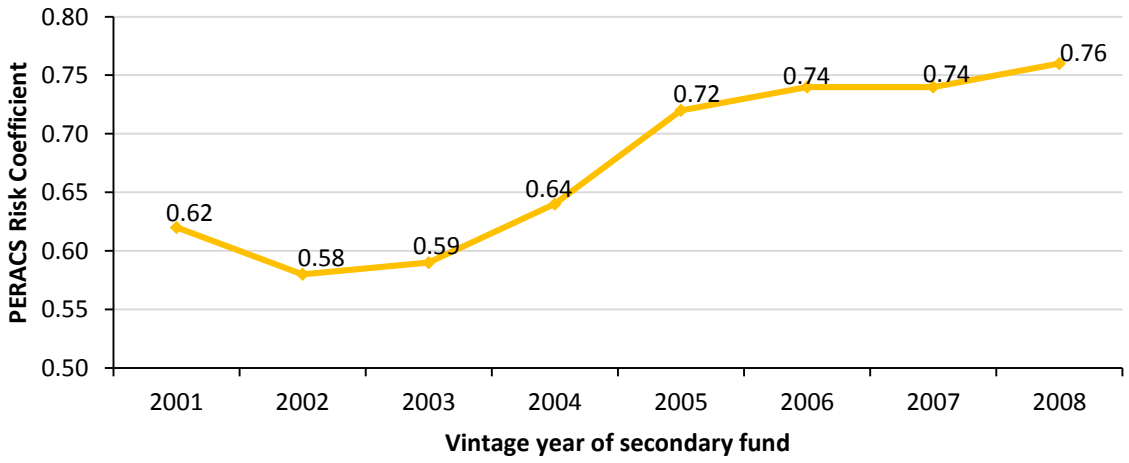
Figures 9 and 10 illustrate how simulated 2001 to 2004-vintage secondary funds have much earlier break-even points – point at which the portfolio is no longer loss making – and have lower risk than simulated 2005 to 2008-vintage secondary funds (Risk Coefficients of 0.61 vs. 0.74). This is because the performance of secondary funds is ultimately driven by the value of a primary fund's unrealised portfolio at entry (which drives price) and subsequent value creation (which drives returns). Both of which are influenced by the economic cycle.

Figure 9: Impact of economic cycle: PERACS Risk Curve and Coefficient, by vintage year of secondary fund*



*Mid secondary fund, investing in all quartiles, and at par
Source: PERACS analysis using Preqin data

Figure 10: Impact of economic cycle: PERACS Risk Coefficient, by vintage year of secondary fund*



*Mid secondary fund, investing in all quartiles, and at par
Source: PERACS analysis using Preqin data

Conclusion

This study investigates the key drivers of risk for investors in secondary funds: fund age, acquisition structure, General Partner's underlying fund quality, and the economic cycle. Preqin's buyout fund performance data is used to simulate this risk.

Key research findings:

- Secondary fund risk increases with the age of primary funds targeted. Secondary funds targeting tail-end funds have higher risk than those targeting younger funds. This is because the differential between top and bottom-performing funds in an underlying portfolio increases over time.
- Investors acquiring a preferred equity position in funds with a structured investment approach decrease risk versus investors in traditional secondary funds. Their senior position, resulting in priority on portfolio distributions, and contractual return, reduces the risk taken on each transaction. Lower risk is typically combined with lower participation in the portfolio upside. Hence, investors selling to preferred equity buyers keep a greater share of their portfolio's upside potential.
- There is an intuitive relationship between the performance quartile of the General Partner and secondary fund risk. For 2001 to 2008-simulated secondary fund vintages, a secondary fund selecting the best-performing primary funds (i.e. first and second quartiles) has a lower risk than a secondary fund selecting third quartile funds.
- The stage of the economic cycle impacts secondary fund risk. 2001 to 2004-vintage secondary funds have lower risk than 2005 to 2008-vintage secondary funds. This is because the performance of secondary funds is ultimately driven by the value of a primary fund's unrealised portfolio at entry (which drives price) and subsequent value creation (which drives returns). Both of which are influenced by the economic cycle.

Professor Oliver Gottschalg, HEC Business School and Founder of PERACS

PERACS is a leading provider of quantitative analytics for the private equity industry, helping investors achieve a better understanding of the value drivers behind private equity investments and, subsequently, to make better investment decisions. PERACS offers specialised consulting services to institutional and other sophisticated investors by providing detailed insights into the key aspects of private equity investment performance.

Augustin Duhamel, Managing Partner, 17Capital

17Capital is a specialist preferred equity investor in private equity funds. Preferred equity is a type of structured investment enabling investors in private equity to unlock liquidity while preserving the future upside of their portfolios – an alternative to a traditional secondary sale. Established in 2008, 17Capital has €800 million under management across three funds. The firm recently won awards for 'Excellence in Private Equity Fundraising' and 'Innovation in the Private Equity Secondaries Market'.