



Your bridge to the world of private assets

Is private equity really illiquid?

Self-liquidation of private equity portfolios

January 2016

Executive summary

Common statements about private equity include:

- private equity outperforms public markets
- adding private equity to a portfolio enhances the portfolio's return
- private equity is an illiquid asset class

Our research shows that:

- the illiquidity of private equity is less of an issue than commonly thought
- private equity portfolios make cash distributions that are equal to the NAV in approximately 4-5 years
- by construction, some portfolios can be more cash yielding than others
- unless (i) immediate liquidity is needed or (ii) one takes a negative view on the quality of the portfolio and on the future returns of the investments, a secondary sale of private equity interests is somewhat questionable on an economic basis alone

New investors in private equity:

- should not be concerned about illiquidity
- can withdraw from private equity without having to face losses (self-liquidation property)
- can design portfolios that are rapidly cash-flow positive
- can quantify the cash requirements by means of simulations
- should commit to private equity funds for at least 5 years

Long-term investors in private equity:

- are cash-flow positive in most situations
- can consider their private equity portfolio as partially liquid but not predictably so with any great accuracy
- should look at solutions other than secondary sales for portfolio management

Abstract

Private equity is an illiquid asset class; investors cannot sell their funds when they want to without potentially facing high losses. However, unlike other illiquid asset classes, private equity is a distributing asset - a cash-flow based asset class that generates liquidity when the underlying investments are sold. If an investor stops committing to new private equity funds then his residual net asset value (NAV) eventually decreases as the underlying investments are exited. For mature private equity portfolios, the investor's net cash flow is likely to be positive, indicating that distributions are larger than capital calls. The NAV is transformed into cash without requiring any action from the investor; we refer to this process as the self-liquidation property of private equity portfolios.

The purpose of this paper is to have a closer look at this characteristic. We show that, on average, if an investor stops committing to new funds, a mature private equity portfolio is expected to distribute 25% per annum of its NAV after the last commitment year. This ratio decreases by 1.5% annually and strongly depends on the market environment; the expected net cash flow is 70% lower during a recession and 70% larger during a boom period. An investor can assume that its private equity portfolio will have returned 100% of its NAV after 4-5 years. Therefore, despite being considered an illiquid asset class, private equity is generating a sufficient amount of liquidity to receive its residual value in a reasonable timeframe.

Allowing the portfolio to liquidate itself might be considered a risky technique at first glance compared to a secondary sale. However, for mature portfolios, the transformation pace from NAV to cash is relatively high, which implies a corresponding market risk reduction. We show that compared to a public equity buy-and-hold strategy, the terminal value (after self-liquidation) has a much lower volatility whilst generating a significant outperformance despite the presence of cash drag. Therefore, unless a private equity portfolio is clearly expected to perform poorly, or an investor has immediate liquidity needs, there is no reason to sell it on the secondary market.

1. Introduction

Private equity funds generally have a contractual initial life of ten years – most often in the form of a limited partnership or equivalent vehicle. The terms of the partnership between the fund manager, also called General Partner (GP), and the investors, also called Limited Partners (LPs), are governed by a Limited Partnership Agreement (LPA), which generally specifies the term of the partnership, the management and performance fees, the governance principles as well as investment parameters and restrictions. The first 5-6 years correspond to the fund’s investment period, during which the GP can draw down from the capital committed by LPs. Generally, after the investment period, the GP can no longer draw down unused committed capital other than for fees, expenses and follow-on investments. As soon as investments are realized (underlying companies are sold or liquidated after going public), the capital and profits are returned or distributed to the LPs.

Figure 1 presents the typical cash flow and NAV evolution of a private equity fund during its life. Capital is called during the investment period; at the same time, the net asset value of the fund is growing. In later stages, cash is distributed to the investors. As one can see in this figure, after the investment period, the distributions become larger than the called capital and the NAV decreases. A private equity fund generates cash as the positions it holds are liquidated. The ratio of distributed and remaining value to the invested capital, called the total value to paid-in (TVPI), is one important measure of the performance of the fund. A value larger than 1.00 indicates that the investor has potentially made a gain. The gain is effective when the sum of all distributions is larger than the called capital. On average, liquidated private equity funds with vintages between 1986 and 2004 have a TVPI of 1.93x¹. This measure does not tell the whole story as it does not take the timing of the cash flow into account. Therefore, it is often presented along with the internal rate of return (IRR) of the fund. On average, liquidated private equity funds with vintages between 1986 and 2004 have an internal rate of return (IRR) of 16.7%².

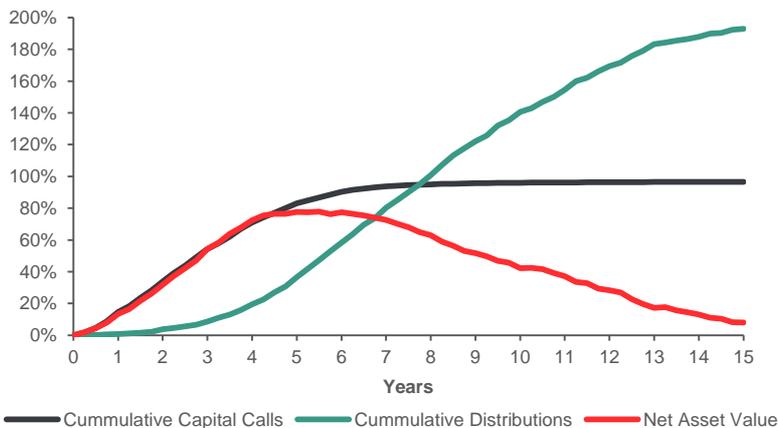


Figure 1. Typical cash flow and NAV evolution of a private equity fund (mean NAV and cash flow of buyout funds with vintages between 1986 and 2004 from the Cambridge Associates database as of December 31, 2014).

As confirmed by previous performance measures, private equity can produce strong returns. However, investing in a single private equity fund can be risky as the amount of money lost in bad cases can be relatively high. The risk can be greatly reduced by diversification; for example, investing into five private equity funds per year during five years (total of 25 funds) leads to an iCaR of 0%. Some sub-asset classes of private equity are less risky than others. For example, just investing into three buyout funds during three years also leads to an iCaR of 0%, which would not be the case when widening the investment universe to all private equity funds. Throughout this paper, we consider a fictive investor that takes advantage of the diversification available in private equity by investing in different private equity sub-asset classes.

In section 2, we show that investing in a diversified private equity portfolio during a sufficiently long period leads to a self-liquidating portfolio i.e. cash is distributed to the investors as investments are exited and the portfolio’s net asset value is

¹ Source: Cambridge Associates as of Q1 2015, Pooled TVPI of all liquidated private equity funds.

² Source: Cambridge Associates as of Q1 2015, Pooled IRR of all liquidated private equity funds.

decreasing. After showing that the liquidation rate is larger than generally expected, section 3 links private and public equity to show that the observed high liquidation rate de-risks the portfolio and that the volatility of the terminal value is lower for private equity compared to public equity. Section 4 aims to give a better understanding of some of the external factors driving the liquidation rate. How important is the number of continuous years committing to private equity? What about the age of the portfolio? Is the market environment affecting the investor’s cash flow? The last section introduces some of the cash flow simulation methodologies that are available for investors to quantify the risks present in the portfolio. It also shows that these tools can be used for portfolio planning and design.

2. Self-liquidation of private equity

Illiquidity is one of the major perceived risks when it comes to considering private equity as an asset class in which to invest. By means of historical simulations, this section shows that despite being illiquid, private equity funds are self-liquidating i.e. after a certain number of years, the net cash flow is positive whilst the net asset value decreases.

Before examining how a portfolio of private equity funds is liquidated, we will first define how it is constructed. We simulate the portfolio of a fictitious investor who commits to private equity regularly and in a diversified manner. Therefore, it makes sense to use pooled cash flows per vintage year to approximate the private equity portfolio; the Cambridge Associates³ database has been used for this purpose. The left hand side of Figure 2 shows the evolution of the net cash flow of portfolios committing USD 1 million per year during 10 years. Each black line represents the quarterly net cash flow evolution of a portfolio with different starting vintage years ranging from 1986 to 2005. The green line represents the average case. Typically, the investor needs about USD 3 million to finance this investment strategy and after 7-8 years, the portfolio starts to be self-financing i.e. the distributions are larger than the capital calls. Some scenarios are self-financing in later stages and also have higher financing costs. Figure 2 also presents the corresponding NAV evolution on the right hand side. The large swings correspond to the historical period where a large NAV growth took place followed by a significant decline in valuations: the dot com crisis and the aftermath of 9/11.

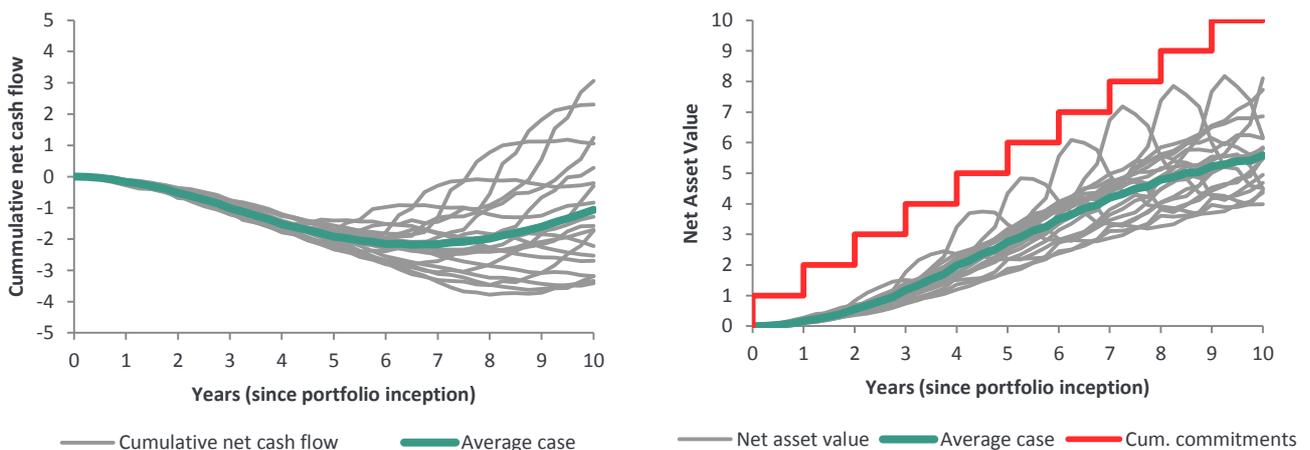


Figure 2. Net cash flow and NAV of private equity portfolios investing across 10 years. The green line represents the average situation. The red line shows the cumulative annual commitments (investment schedule).

This paper aims to focus on the period that is not displayed in the previous figures. What happens to the NAV and to the net cash flow if an investor suddenly decides or is forced (for whatever reason) to stop committing to private equity? Considering the situation depicted in the previous graph, we expect the portfolios to be self-financing after 7-8 years. What will happen to the NAV? Will it grow further or will it decrease? How would it look if the decision to withdraw from private equity takes place at an earlier stage, when the portfolio is not yet mature?

³ Quarterly private equity cash flow and NAV from the Cambridge Associates database as of Q4 2014. Cambridge Associates obtains data from LPs and from GPs who have raised or are trying to raise capital. Therefore, it might have a bias towards better performing managers. However, given the large coverage of the database, this bias is likely to be relatively low.

Figure 3 shows that after investing in private equity for 10 years, the portfolio typically generates sufficient cash to be self-financing for the rest of its life. The asset base slightly increases during the first 1-2 years because the last committed funds are still building up exposure and then steadily decreases thereafter. The annual distributed cash is close to 20% of the starting NAV. On average, the portfolio pays out 100% of its starting NAV after 4-5 years. These numbers perfectly explain what we wanted to highlight about private equity: despite being illiquid, it is self-liquidating!

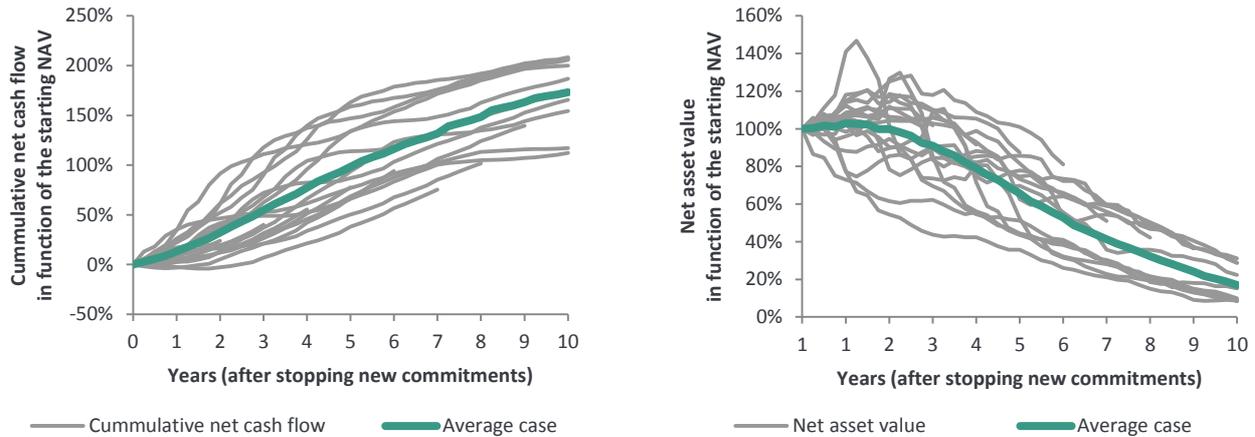


Figure 3. Net cash flow and NAV of private equity portfolios after having invested regularly across 10 years. The starting vintage is 1986 and the last one is 2004. For the last considered vintage, the figure presents only one year of data.

The portfolio is not only self-liquidating but is also expected to generate a positive return for the investor, as displayed by the cumulative net cash flow exceeding 100% after 5 years in the median case. Some interesting performance statistics about the 10-year liquidation period are shown in Table 1. On average, the portfolios generate a multiple close to 1.8x of the NAV at a time when the decision to stop investing is made; the worst case is about 1.2x. Therefore, given the remaining upside, keeping the investments might be beneficial in the long term compared to selling them on the secondary market at par.

	Min	Mean	Max
DPI	1.10	1.67	2.03
TVPI	1.21	1.78	2.12

Table 1. Statistics about the 10 year performance of a private equity portfolio after discontinuing commitments to new funds in year 10.

The number of years during which the investor commits to private equity has a profound impact on the cash flow profile during the liquidation period. For a small number of commitment years, most of the funds are still in the investment phase and are drawing capital from the investor. Therefore, the portfolio is not likely to be cash-flow positive. This situation is illustrated in Figure 4 where younger portfolios are illustrated with colored lines. The cash flow patterns for more mature portfolios are depicted in black; these portfolios are almost self-financing from the start. By committing to private equity over at least 7 years, the investor will have built a portfolio that is, on average, self-financing. Therefore, ideally, a decision to invest in private equity should be a commitment to the asset class of at least 7 consecutive vintage years. After 5 years, an investor has already built a portfolio that is close to being self-financing.

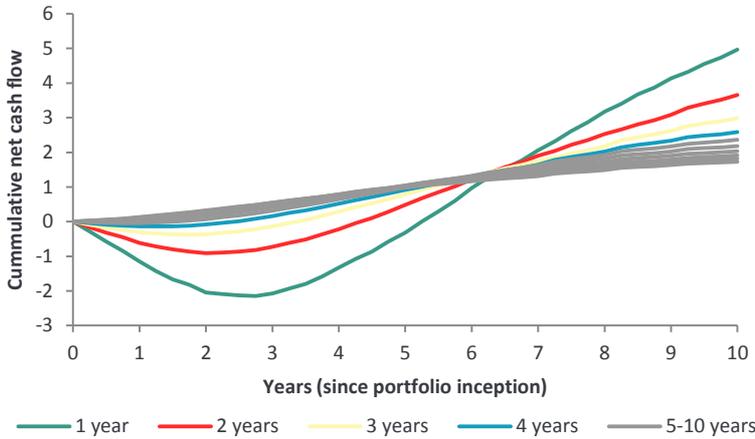


Figure 4. Liquidation rate of the net asset value in relation to the number of commitment years.

Interestingly, all of the lines within Figure 4 seem to cross approximately at the same time. There is no apparent connection between all of the scenarios; it is rather a coincidence that after 5-7 years after completion of the portfolio, all of the portfolios have distributed approximately 150% of their starting NAV.

3. Comparison to public equity

Refraining from committing to new private equity funds without selling the portfolio can be seen as a buy-and-hold strategy. Therefore, it makes sense to compare it to a buy-and-hold strategy in the public equity market. Figure 5 summarizes this comparison. The public and private equity portfolios are fully invested at the start. As explained previously, the private equity net asset value is decreasing and cash yielding. We replicated this behavior on the public side by selling the same percentage of NAV as the private equity portfolio and compared the results. As illustrated by Figure 5, while maintaining a similar exposure (NAV), the private equity portfolio is yielding significantly more cash.

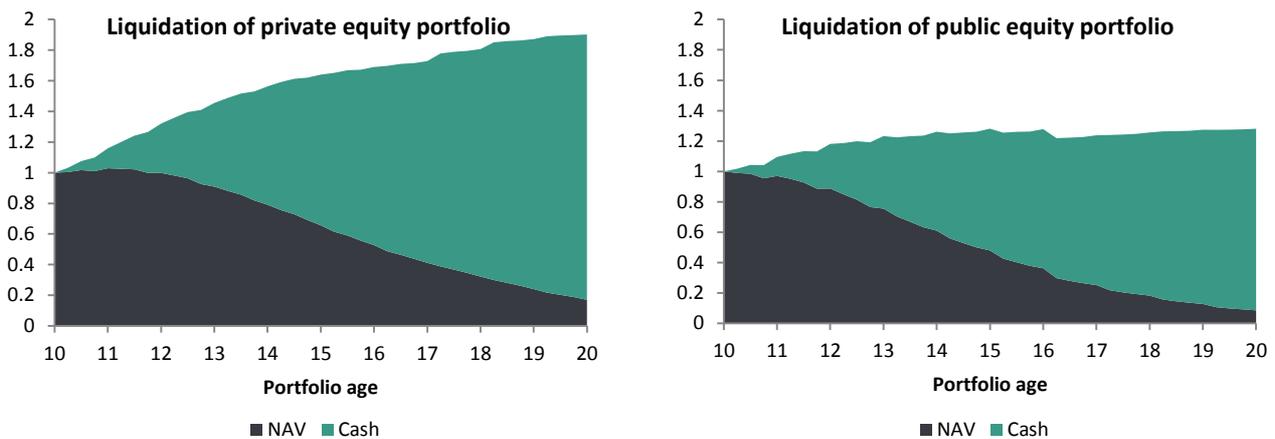


Figure 5. Comparison of the liquidation period (considered as a buy-and-hold strategy) to the evolution of a public equity portfolio where the cash flow is generated by the dividends and by the replication of the private equity liquidation rate. Source: Capital Dynamics calculations based on Cambridge Associates data as of Q4 2014 and Bloomberg data (S&P 500).

4. Factors driving the liquidation rate

As shown previously, the average liquidation pattern is similar for mature private equity portfolios. It is also interesting to note that the black lines in Figure 4 are relatively straight, meaning that the average liquidation rate is relatively constant. However, individual situations may differ significantly from the average case as depicted in Figure 3. In Figure 5, the normalized quarterly net cash flow curves have been realigned with their respective vintage years; it shows that the market environment is a very important factor. The net cash flow that an investor receives is correlated with the market conditions

and tends to be smaller during periods of recession. Two separate crises and the exuberance leading up to them had a profound impact on the private equity cash flows: the dot com crisis and the financial crisis of 2007–08.

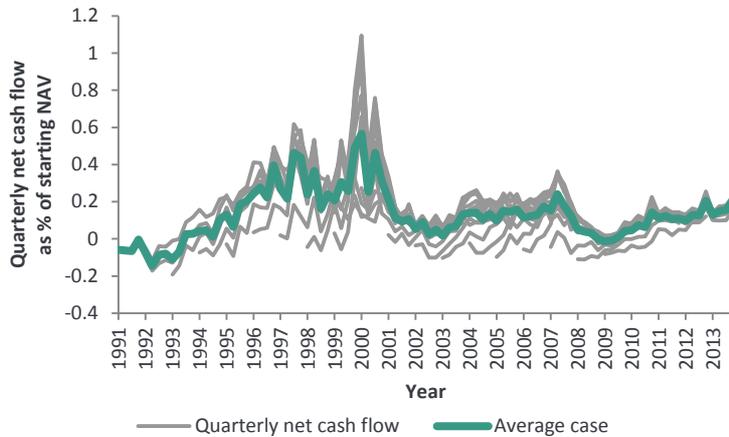


Figure 6. Quarterly net cash flow for private equity portfolios after having invested regularly during 10 years. First vintage is 1986 and last one is 2004. For the last considered vintage, the figure presents only one year of data. Data is shown as a function of the vintage year and not as a function of the age of the portfolio.

So far, we have identified a constant factor driving the net cash flow that seems to be changing slightly through the course of time and varying market conditions. These factors can be summarized in a sensible yet simple net cash flow model presented by Equation 1. The net cash flow an investor can expect after i years if they stop committing to private equity is approximated as a percent of the starting NAV.

$$NCF_o(i) = const + \delta i$$

Equation 1. The net cash flow at year i is made of a constant term and depends linearly (with a factor δ) on the number of years since the investor stopped committing to private equity funds.

We have shown previously that the age of the portfolio is a key driver of the average net cash flow an investor receives. Therefore, the model defined by Equation 1 has been fitted for portfolios with different ages defined in relation to the number of years an investor commits to private equity before withdrawing from the asset class. The results are shown in Table 2. For mature portfolios (invested over four or more years), the model indicates that in a normal situation the investor can expect to receive approximately 25% of its NAV back per year. This value is expected to decrease gradually by 1.5% every subsequent year.

Invest years	Const	Alpha
7	26.66%	-1.48%
8	25.90%	-1.54%
9	24.30%	-1.48%
10	23.28%	-1.43%

Table 2. Optimized parameters for the first net cash flow model.

Based on the average case stated above, the NAV is paid back in slightly less than 5 years. This value is confirmed by the historical simulations show in Figure 7. The boxplot presents the median, the upper and lower quartiles and the minimum and the maximum of the number of years needed to get the NAV value back. The median and minimum time to wait decreases with the maturity of the portfolio, whereas the worst cases seem to be more stable and mature portfolios never needed more than 8 years to liquidate their NAV after the decision to stop committing has been taken.

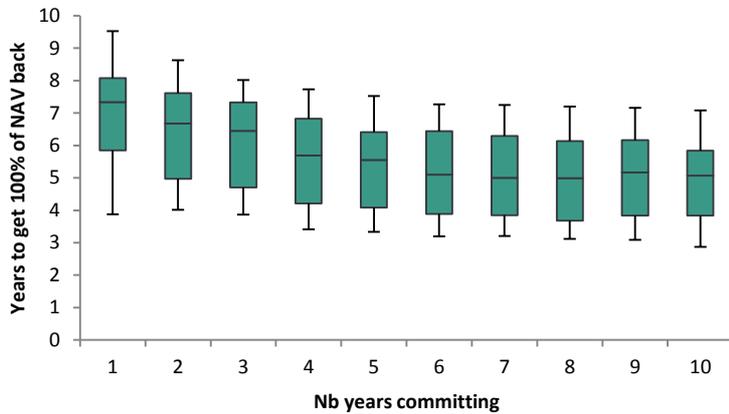


Figure 7. Boxplot of the number of years required to receive 100% of NAV after withdrawing from private equity.

It is possible to deduce from Figure 6 that some years produce exceptionally strong net cash flows and others very weak ones. This information can be incorporated in the model. The major outcome is that during recession years, the expected distribution is reduced by 70% and that during outstanding years, an investor can expect to get 70% more. By recognizing the market environments relevant in the models, it is possible to link the expected cash flow with future market hypothesis.

5. Optimize liquidity management with simulations

We have shown that when a private equity portfolio ages, it tends to become self-financing. However, it may take some time to reach this state and even a mature portfolio might experience years where the sum of the capital called is larger than the distributions. Therefore, prudent investors need adequate risk management tools allowing them to quantify the liquidity requirements in adverse situations. Cash flow simulation fulfills this purpose.

Modelling the cash flow of a private equity portfolio is challenging and different approaches exist to accommodate such challenges. The simplest models generally use shape functions that represent the future cash flow as a single smooth line for each fund. This approach has the disadvantage of disregarding the variability of the cash flows and focusing solely on the average case. This limitation can be overcome by using Monte Carlo methods based on historical private equity data. The simulations can be enhanced by taking into account the relationship between private and public equity. For each run of the Monte Carlo method, a unique simulated public market environment can be used to scale the distributions and the NAV of the private equity portfolio. Figure 8 (left) shows an example of such a simulation for a portfolio invested over three years in US buyout funds (three funds per year).

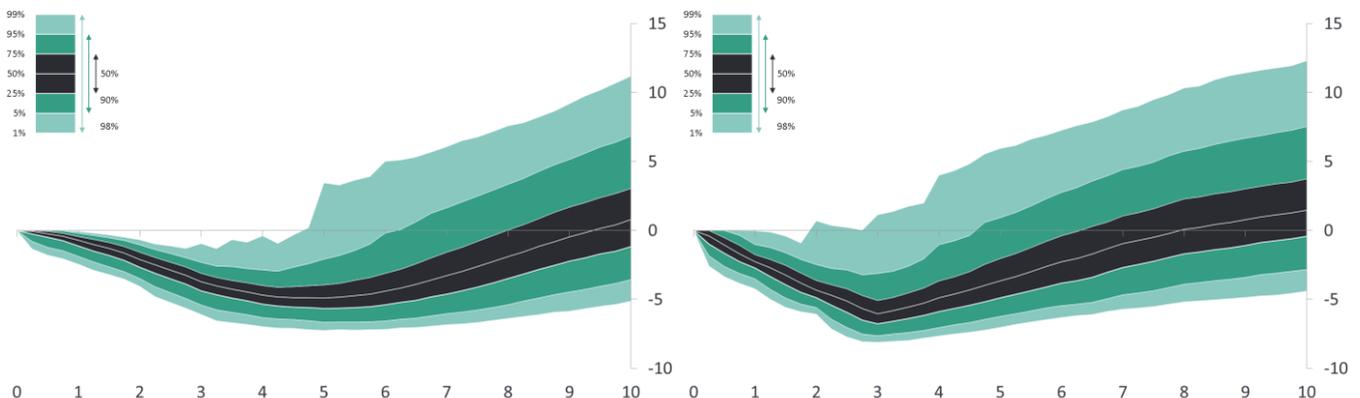


Figure 8. Cash flow simulations for a fictitious portfolio of primary funds (left) and of a fictitious portfolio of secondary positions (right).

The net cash flow chart of the portfolio of primary funds illustrated in Figure 8 is a powerful tool to derive the liquidity requirements in various scenarios and especially in adverse situations. Different hypothesis about future commitments can be added and compared. Therefore, the simulations can also be used to optimize future commitments (funds' geographies, styles and ticket sizes) in relation to the expected liquidity generated by a portfolio and the specific requirement of an investor.

An investor's cash flow can also be optimized by adding secondary investments to its portfolio. These transactions can also be taken into account during the cash flow simulations. Secondaries might have a deep impact on the private equity portfolio, as acquiring existing investments will immediately increase the NAV and require liquidity. Distributions from a secondary fund can be expected earlier compared to primary investments. Therefore, secondaries can be used to boost future cash flows for the investors and lead to portfolios that are cash-flow positive sooner than primaries. Figure 8 (right) illustrates this by re-conducting the previous cash flow simulations with three year old secondaries instead of primaries (all other parameters remaining the same). Instead of being expected to be cash flow positive after five years, the portfolio is already in this state after only three years. Therefore, secondaries are interesting portfolios as they could produce the previously described self-liquidation characteristic in a shorter period of time than primary funds could. This is confirmed by comparing the expected amount of time needed for the portfolio shown in Figure 8 and Figure 9 to have returned the invested capital: 1.5 years earlier for the secondary portfolio. Additionally, from a portfolio construction point of view, secondaries are a key tool in building up portfolios that are diversified almost since the start.

Concluding remarks

We have shown that despite being an illiquid asset class, private equity naturally generates liquidity for investors. Combined with the fact that mature portfolios are generally self-financing, an investor who is considering liquidating the portfolio needs to balance the advantages and disadvantages of a secondary sale compared to letting the portfolio liquidate itself naturally. We have shown that the latter can be attractive from a risk and return point of view. However, different situations can motivate investors to sell all or part of their private equity portfolio on the secondary market; we have shown that acquiring such a portfolio can be attractive for investors as it often has the described self-liquidation characteristic and is expected to produce attractive returns. The observation that a mature private equity program generates significant cash (i.e. on average 25% of the NAV after the last commitment year is distributed annually) should also alleviate the often perceived concern that private equity is a very illiquid asset class.

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The firm's history dates to 1988. Its senior investment professionals average over 20 years of investing experience across the private equity spectrum⁵. It believes that its experience and culture of innovation give it superior insight and help it deliver returns for its clients. It invests locally while operating globally from its London, New York, Zug, Tokyo, Hong Kong, Silicon Valley, Munich, Birmingham, Seoul, and Scottsdale offices. More information about Capital Dynamics is available at www.capdyn.com.

⁴ Capital Dynamics comprises Capital Dynamics Holding AG and its affiliates; assets under management/advisement, as of March 31, 2015, include assets under discretionary management, advisement (non-discretionary), and administration across all Capital Dynamics affiliates. Investments are primarily on behalf of funds managed by Capital Dynamics.

⁵ Average years of experience held by Capital Dynamics' 20 most-senior investment professionals.

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