

Diversification in direct lending

NOVEMBER 2023



Introduction

In portfolio construction, diversification is paramount owing to its capacity to mitigate risk, particularly in the face of tail events. This is especially true in direct lending, where investors tend to focus on downside protection: Too much concentration in a single borrower can amplify return volatility and cause material negative impacts on the overall portfolio's performance. A comparable risk exists when a portfolio's loans are acquired through a single general partner (GP), essentially tethering the portfolio's outcomes to the performance of that sole GP.

This article employs our proprietary data to highlight the merits of diversification through two dimensions: the number of positions and the number of GPs within a portfolio. We also attempt to assess these advantages quantitatively by utilizing measures such as internal rate of return (IRR) and loss rate distributions. Our findings indicate that a more diversified approach corresponds with less severe tail events.

Data

Our analysis relies on our proprietary database of middle-market loans, which encompasses more than 22,500 loan tranches and represents approximately \$678 billion in effective drawn amount. To ensure the robustness of the study, we include only direct US first-lien loans. This approach helps us eliminate region-specific characteristics, minimizes discrepancies arising from different capital structures, and ensures that GPs pursuing other strategies (e.g., opportunistic or distressed lending) are excluded.

Direct loans often feature multiple tranches, each ranking *pari passu*. A single transaction could therefore encompass a term loan, a revolving facility and a delayed draw term facility. To nullify any potential bias stemming from such structures,

we have exclusively incorporated the "main tranche" of each transaction. This refers to the tranche with the largest drawn amount, which is most often a term loan. In addition, we removed GPs that made fewer than 10 loans in our dataset to avoid any potential bias in our analysis. We also excluded loans with incomplete data.

This data cleaning process left us with a final dataset made up of 5,030 loans, representing more than \$185 billion in effective drawn amount. These loans were made between 2006 and 2021 and were sourced from a diverse pool of 41 GPs (**Figure 1**).

Methodology

The initial segment of our analysis centers on evaluating the influence of borrower concentration on a portfolio's IRR (net of losses and gross of GP fees and costs) and loss rates. Our aim is to determine if reducing single borrower concentration within a portfolio reduces the severity of tail risks and to quantify the potential impacts.

FIGURE 1: DESCRIPTIVE STATISTICS

Statistics	Loans		GPs
Count	5,030		41
KPI (Settlement value)	First quartile	Median	Third quartile
EBITDA	\$14.1 M	\$30.0 M	\$55.1 M
LTV	36.2%	44.9%	53.7%
Leverage	3.0X	3.8X	4.4X
IRR	7.1%	9.1%	11.8%

Source: StepStone Group, August 30 2023.

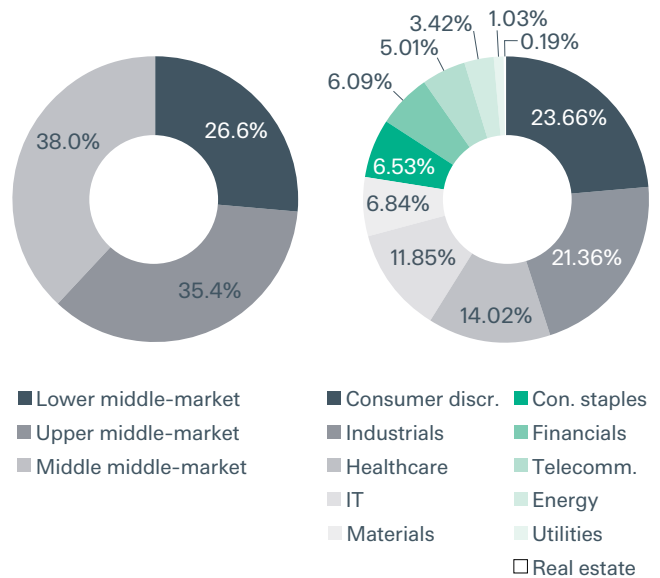
To do this, we implement a methodology that is applied throughout subsequent sections by using either our whole final database or a specific subset of it.

Initially we create a portfolio by randomly selecting a prespecified number of loans from our pool of assets, with replacement (e.g., a portfolio of 100 randomly selected loans).¹ Upon building this portfolio, we estimate its IRR and loss rates by using the simple average of its positions. Finally, after storing the relevant metrics, we build a new portfolio and repeat the process. The number of iterations must be high enough so that we can properly determine the distribution of the outcomes (i.e., IRR and loss rates) for each set of portfolios containing a predefined number of loans. After various trials, we concluded that 100,000 portfolios suffice to build a stable distribution. The choice of opting for the simple average implies that equal weight is assigned to all loans within each portfolio.

NUMBER OF POSITIONS

With our methodology centered on assigning equal weight to all loans, changing borrower concentration becomes straightforward and is achieved by adjusting the number of positions within each portfolio. Our objective is to determine whether lower borrower concentration (essentially, increased diversification) corresponds to better outcomes in tail-events. To test this hypothesis, we create six distinct sets, where each set is characterized by portfolios featuring a varying number of loans: 25, 50, 75, 100, 150 and 200 loans, respectively.

FIGURE 2: MARKET SEGMENT & SECTORS SHARES



Source: StepStone as of August 2023. Based on the number of loans.

Middle-Market segmentation based on EBITDA: Lower Middle-Market < \$15 Million, \$15 Million < Middle Middle-Market < \$40 Million, Upper Middle-Market > \$40 Million.

The pool of assets from which these portfolios randomly draw their loans is derived from our entire final dataset as we refrain from imposing further restrictions. Specifically, we neither limit the number of GPs from which loans can be drawn nor place constraints on the GP weights within the portfolios. We also do not set any restrictions on when a loan was originated—essentially allowing for vintage diversification in the simulation.

¹ The use of replacement means that selected loans remain accessible within the asset pool and can potentially be chosen multiple times. It is a common practice and ensures that each loan is always being selected from the same distribution.

The resulting distributions of both IRR and loss rates are displayed in **Figure 3**. These distributions distinctly showcase how higher borrower concentration can amplify risks as demonstrated by the fatter tails experienced by more concentrated portfolios.

FIGURE 3: BORROWER CONCENTRATION: LOSS RATES & IRR TAIL DISTRIBUTIONS



Source: StepStone estimates as of August 2023.

To quantitatively assess the advantages of enhanced diversification, we turn to the percentiles within **Figure 4**, focusing on the extremities of the distribution. For IRR we analyze the 1st and 5th percentiles, and for loss rates we concentrate on the 95th and 99th percentiles, which represent the riskier segments of the distribution.

FIGURE 4: BORROWER CONCENTRATION: LOSS RATES & IRR PERCENTILES

Percentiles	Bucket – loss rates					
	25	50	75	100	150	200
1 st	0.0%	0.1%	0.2%	0.3%	0.4%	0.5%
5 th	0.1%	0.3%	0.4%	0.5%	0.6%	0.6%
10 th	0.2%	0.4%	0.5%	0.6%	0.6%	0.7%
90 th	2.5%	2.1%	1.9%	1.8%	1.7%	1.6%
95 th	3.2%	2.5%	2.2%	2.1%	1.9%	1.8%
99 th	4.7%	3.4%	2.9%	2.6%	2.3%	2.1%
Simple average	1.1%	1.1%	1.1%	1.1%	1.1%	1.1%

Percentiles	Bucket – IRR					
	25	50	75	100	150	200
99 th	12.7%	11.8%	11.3%	11.1%	10.8%	10.7%
95 th	11.7%	11.1%	10.8%	10.6%	10.4%	10.3%
90 th	11.2%	10.7%	10.5%	10.4%	10.2%	10.1%
10 th	7.4%	7.9%	8.2%	8.4%	8.6%	8.7%
5 th	6.4%	7.4%	7.8%	8.2%	8.3%	8.3%
1 st	4.5%	6.3%	6.9%	7.3%	7.7%	8.0%
Simple average	9.4%	9.4%	9.4%	9.4%	9.4%	9.4%

Source: StepStone Group, August 30 2023.

Considering loss rates first, the difference between the loss rates of a 25-position portfolio against a 200-position portfolio at the 95th percentile is 1.4%, while at the 99th percentile it is 2.6%. If the comparison is made between the 95th and 99th percentiles and the simple average loss rate, the increase in the loss rate for the 25-position portfolio is 2.1% and 3.6%. This increase is equal to 0.7% and 1.0% , respectively, for the 200-position portfolio, indicating that the loss rate occurring during a tail event for the highly diversified portfolio is not expected to increase significantly. This material difference between a concentrated portfolio and a highly diversified one showcases how the severity of tail events can be mitigated through lower concentration in the portfolio.

Turning to the IRR table, the difference between a 25-position portfolio and a 200-position portfolio at the fifth percentile is 1.9%, while at the first percentile the difference stands at 3.5%. This further underscores how insufficient diversification can exacerbate tail risk and affect portfolio returns. When measured against the simple average IRR of 9.4%, the fifth and first percentiles of a 25-position portfolio show a difference of 3.0% and 4.9%, respectively. In contrast, a 200-position portfolio would indicate a difference of 1.1% and 1.4% at the fifth and first percentiles when compared with the simple

average IRR. It demonstrates how a more diversified portfolio could mitigate the severity of tail risks.

There seems to be a soft cap to the benefits brought by diversification. The benefit diminishes as portfolio size increases, as evidenced by the smaller tail risk difference between portfolios with 150 and 200 positions compared with the difference between portfolios with 25 and 75 positions.

Another point of interest is how, in some cases, a less diversified portfolio can perform better than a highly diversified portfolio. It is partly due to the higher dispersion (i.e., greater volatility) of the outcomes for more concentrated portfolios. Moreover, it is worth noting that credit has limited upside and thus, while less diversified portfolios can deliver better IRR than more diversified ones, voluntarily introducing more concentration in a portfolio can result in disproportionate risk to the downside.

This analysis underscores the importance of constructing portfolios with minimal borrower concentration to mitigate tail risk. However, in practical application, assembling portfolios with a greater number of loans often necessitates a higher number of GPs to source them. Consequently, a closer examination of the multi-manager approach becomes necessary.

A multi-manager approach

In our previous section, we examined the impact of lower borrower concentration by increasing the number of loans within a portfolio. However, this simplified approach neglected to account for the number of GPs responsible for sourcing these deals. In reality, it is improbable that 10 GPs would procure the transactions for a 25-position portfolio. Similarly, it is unrealistic (barring very large GPs) to expect a sole GP to provide all the transactions for a portfolio of 200 loans. A more nuanced exploration of the multi-manager approach is warranted.

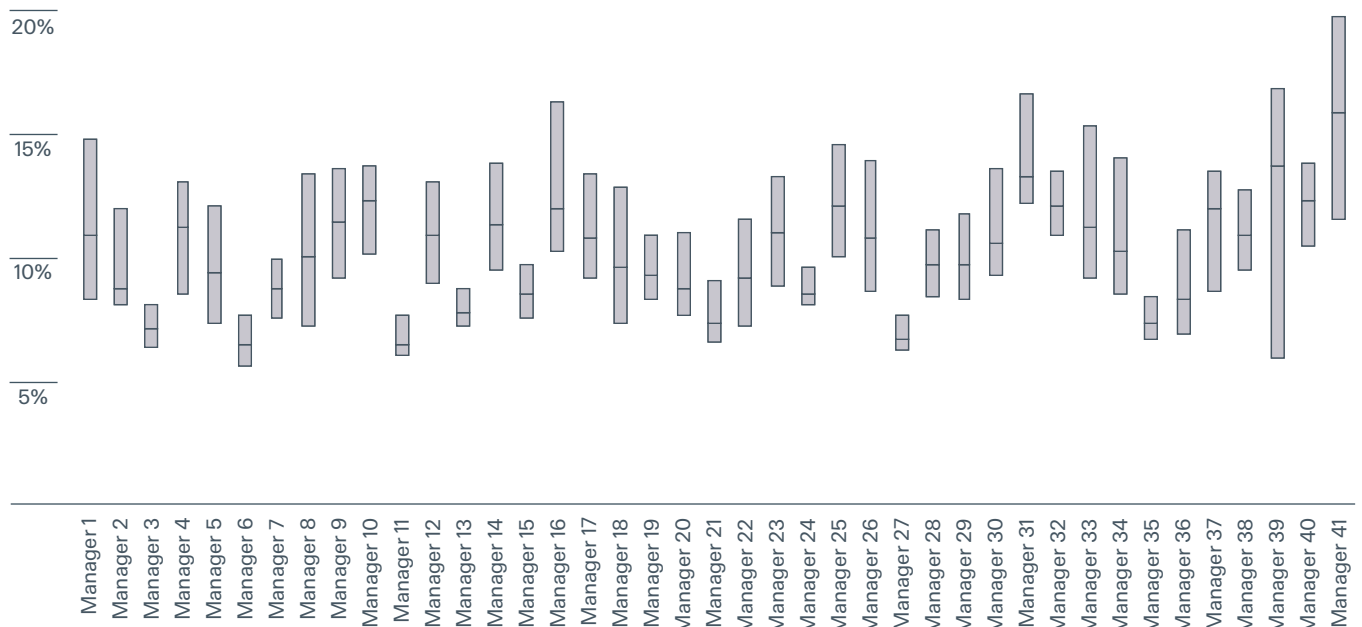
Because direct lending GPs tend to specialize in specific niches of the direct lending space—such as particular market segments—being overly reliant on a single GP can render a portfolio susceptible to idiosyncratic shocks, thereby

negatively affecting returns or the efficient deployment of capital. Looking at the quartiles of the loans' IRR for each GP, as depicted in **Figure 5**, it is noticeable that the IRR quartiles can differ by multiple percentage points across GPs. Therefore, since GP performance can fluctuate materially, an investigation of the advantages of increasing the number of GPs within a portfolio is required.

MULTI-MANAGER APPROACH

For the ensuing analysis, we will adopt a methodology akin to the one utilized to investigate the impact of borrower concentration in the preceding section. This time, instead of leaving the number of GPs unrestricted, we will allow an increasing number of GPs to source the loans for the

FIGURE 5: IRR DISPERSION



Source: StepStone estimates as of August 2023.

portfolios. In addition, for portfolios comprising more than five GPs, we cap their weights at 20% but do not impose any specific weight. For portfolios containing five or fewer GPs, their weights are equal (i.e., the weight of each GP in a portfolio sourced by three GPs will be 33.3%). Our portfolio construction will encompass the following GP counts: 1, 3, 5, 8 and 10. We will consequently generate 30 sets of 100,000 portfolios—representing portfolios with 1/3/5/8/10 GPs and 25/50/75/100/150/200 loans each. As before, all loans within the portfolios will have equal weight, allowing us to evaluate the simple average of IRR and loss rates.

The outcomes are depicted in **Figure 6**, which illustrates that a higher number of GPs coupled with a larger loan count tends to curtail the severity of extreme events. From the 30 distributions we generated through our portfolio construction, we showcase a subset where we have selected a different number of GPs sourcing 200 loans. The trend becomes evident: Escalating the number of GPs within a portfolio—akin to increasing diversification—correlates with less severe extreme events. This reiterates the vital importance of cultivating robust relationships with a wide array of managers.

While the notion of diversifying a portfolio’s GP pool through a fund-of-funds approach might seem attractive, its efficiency may be compromised. Numerous funds might be exposed to the same borrowers, rendering it difficult to monitor overall portfolio borrower concentration. In contrast, increasing GP diversification via distinct Separately Managed Accounts (SMAs) facilitates comprehensive control over portfolio borrower concentration. Thus, this approach offers a substantial advantage over the fund-of-funds alternative.

FIGURE 6: MULTI-MANAGER APPROACH: LOSS RATES & IRR TAIL DISTRIBUTIONS



Source: StepStone estimates as of August 2023.

In **Figure 7**, we once again concentrate on the 1st and 5th percentiles for IRR, as well as the 99th and 95th percentiles for loss rates, to underscore tail risk.

Beginning with loss rates, the difference between the 99th percentile of a 200-position portfolio sourced by one GP and a 200-position portfolio sourced by 10 GPs is 3.5%, while it is 1.5% for the 95th percentile. Considering the simple average loss rate of 1.2%, the differences between the 99th and 95th percentiles of a 200-position portfolio sourced by a single GP and the expected loss rates are 5.0% and 2.4%, respectively. In contrast, when considering a 200-position portfolio sourced by 10 GPs, these figures diminish to 1.5% and 0.9% for the 99th and 95th percentiles. This exemplifies how a well-diversified

portfolio sourced by a higher number of GPs can mitigate losses during tail events.

Turning to the IRR data, the difference between the first and fifth percentiles of a 200-position portfolio sourced by one GP against a portfolio sourced by 10 GPs reveals an IRR difference of 1.5% and 1.8%. Comparing the 95th and 99th percentiles against the simple average IRR of 10.0%, the 200-position portfolio sourced by 10 GPs demonstrates a decrease in IRR of 2.0% and 1.3%, respectively. In contrast, for a 200-position portfolio with a sole GP, the decreases stand at 3.5% and 3.1%. This further substantiates the benefits of return preservation attributed to diversification.

FIGURE 7: MULTI-MANAGER APPROACH: LOSS RATES & IRR PERCENTILES

99 th percentiles loss rates (%)						
#Loans #GPs	25	50	75	100	150	200
1	7.6	6.8	6.6	6.4	6.3	6.2
3	5.8	4.7	4.3	4.0	3.8	3.7
5	5.3	4.2	3.8	3.5	3.2	3.1
8	5.1	4.0	3.5	3.3	3.0	2.9
10	5.1	3.8	3.4	3.1	2.9	2.7
Simple average	1.2	1.2	1.2	1.2	1.2	1.2

95 th percentiles loss rates (%)						
#Loans #GPs	25	50	75	100	150	200
1	4.2	3.9	3.7	3.7	3.6	3.6
3	3.7	3.2	3.0	2.9	2.8	2.7
5	3.6	3.0	2.7	2.6	2.5	2.4
8	3.5	2.9	2.6	2.5	2.3	2.2
10	3.5	2.8	2.6	2.4	2.3	2.1
Simple average	1.2	1.2	1.2	1.2	1.2	1.2

1 st percentiles IRR (%)						
#Loans #GPs	25	50	75	100	150	200
1	3.8	5.3	5.8	6.1	6.4	6.5
3	4.2	5.9	6.4	6.7	7.1	7.2
5	4.5	6.0	6.8	7.0	7.5	7.6
8	4.5	6.3	6.9	7.3	7.7	7.9
10	4.6	6.3	7.0	7.4	7.8	8.0
Simple average	10.0	10.0	10.0	10.0	10.0	10.0

5 th percentiles IRR (%)						
#Loans #GPs	25	50	75	100	150	200
1	6.3	6.7	6.8	6.9	6.9	6.9
3	6.6	7.3	7.6	7.7	7.9	8.0
5	6.7	7.5	7.9	8.1	8.2	8.3
8	6.7	7.6	8.0	8.2	8.4	8.6
10	6.7	7.7	8.1	8.3	8.5	8.7
Simple average	10.0	10.0	10.0	10.0	10.0	10.0

Source: StepStone estimates as of August 2023. Cells highlighted in green represent the assumed “realistic” sets of # GPs / # Loans.

Conclusion

Diversification stands as a fundamental pillar within portfolio construction, yielding valuable advantages in diminished severity during tail events. This paper has undertaken an analysis quantifying a portion of these benefits. By examining the distributions of IRRs and loss rates within randomly assembled portfolios, and by introducing various avenues for diversifying portfolio exposure, we offer quantifiable insights.

Our findings underscore that mitigating borrower concentration by imposing limits on their weighting within a portfolio effectively diminishes the severity of extreme events. This reduction in severity consequently mitigates the risk associated

with specific positions, thereby curtailing potential losses. Moreover, the inclusion of the GP dimension revealed that portfolios containing a higher count of loans and GPs responsible for their origination exhibit reduced tail risk severity. This highlights the advantages of a multi-manager approach.

Overall, these findings provide compelling evidence that well-considered diversification, using multiple GPs and a large number of loans, is pivotal in safeguarding portfolio performance against adverse events and ensuring the preservation of returns. This also underscores the importance of a multi-manager approach in minimizing portfolio risks and enhancing overall returns.

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