



**MULTIPLE CRITERIA DECISION SUPPORT FOR PRIVATE EQUITY
SECONDARY TRANSACTIONS**

Lappeenranta–Lahti University of Technology LUT

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ABSTRACT

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Multiple Criteria Decision Support For Private Equity Secondary Transactions

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The main financial topic is private equity secondary transactions. Private secondaries give general partners and limited partners flexibility to extend the time horizon of an investment or exit early. This flexibility is valuable because private markets are illiquid, so these transactions almost always close at a discount. This thesis describes motivations, transaction details, and expected financial outcomes for the general partner, existing limited partners, and potential new limited partners in a GP-led secondary transaction.

When studying private markets, data availability is always a concern. The best possible data for this thesis is behind significant paywalls or non-disclosure agreements. Nonetheless, a sample was collected based on the top fundraisers, reported by *Secondaries Investor*, and the *Amadeus* database key financial information. Multiple criteria decision making analysis was conducted using this data in a decision matrix. With four criteria and two performance measures, there was clear differences between the top, middle, and bottom ranked fund managers.

The goal of this thesis is to provide a methodology for investment professionals to use a decision matrix and multiple criteria decision making to support investment decisions. On a deal-by-deal basis, deals can be entered into a decision matrix and the analyst would see if the new deal is more similar to deals that get passed or deals that get investment capital. On a fund manager level, an institutional investor can use the methodology to rank fund managers for potential investment. The multiple criteria analysis would provide one tool to support the decision makers in these situations.

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1 Introduction

The topic of my Master's thesis is private secondary transactions. This term and other relevant financial vocabulary are defined later in the thesis as well as the glossary in Appendix 2. My interest in private secondaries comes from my internship between the first and second year of my Master's studies. I worked with the Portfolio Advisors GP-led Solutions team based in Dallas for the summer. During my time, I learned about the buy side perspective for private equity transactions. I analyzed the confidential investment memorandums for many deals, conducted due diligence, and submitted first and second round bids to eventually close deals. Continuation vehicles are relatively new, starting in the mid-2010s by Brain Mooney, one of my supervisors at Portfolio Advisors. Through my work experience, I am uniquely qualified to deliver a Master's thesis concerning this topic for both academic audiences as well as secondary investment professionals. My goal is to provide decision making support to institutional investors who have access to relevant data. This will aid institutional investors in differentiating between high and low performing secondary fund managers and guide investment decisions.

The methodology is an application of a decision matrix using multiple criteria decision making. A decision matrix has alternatives, in this case fund managers, as the rows and criteria as its columns. It is filled with the criteria value for each alternative. The decision matrix can be standardized and transformed to allow for further analysis. There are different strategies based on risk tolerance and other aggregation methods suggest different ordering of alternatives. With performance data, the relative rankings from the decision matrix and performance measures can be compared.

The conclusions are limited by the sample size and data availability. I have the *Secondary Investor* and *Amadeus* data for the top ten fundraising fund managers. The limited use takeaways from this thesis are that high performing fund managers are either large, reputable fund managers with many employees and high profit or smaller fund managers with fewer employees, but high profit per employee. Low performing managers tend to have less than 800,000 euros of profit for the period. The best indicator of performance is profit per employee. In both 2021 and 2018 data, the distribution of profit per employee aligned with high, medium, and low performing fund managers.

Private markets, in general, are rarely researched in academia. This first issue is lack of data transparency and the second issue is lack of familiarity with the subject matter. As someone who is familiar with this private transaction, I am motivated to study this topic with the data and methodology available to me as a master's student. I understand the process and understand how multiple criteria decision making can be a useful tool in many aspects of the secondary decision making process. My existing limitations in this these come from the lack of deal specific information or the entire universe key financial information for secondary fund managers. From the available data, I can implement a methodology that compares fund managers based on performance metrics and criteria. While my data is limited, similar methodology and analysis can be applied by institutional investors or industry professionals who have much more data access and availability. The purpose of this thesis is twofold. First, I propose a methodology for applying multiple criteria decision making for private secondaries. Second, I apply the methodology to a limited dataset as an example of the analysis and conclusions that can be drawn. My conclusions are similarly limited, but indicative of the support provided to decision makers.

The literature review discusses two primary topics: private secondary transactions and multiple criteria decision making. The secondaries portion of the literature review will familiarize the reader with the transaction details, motivation for different parties, and anticipated financial outcomes. Different applications of multiple criteria decision making are discussed in the literature review. The data section explains data availability and quality concerns and solutions. The particular application of a decision matrix is explained in more detail in the methodology section. The results section has the main outcomes of analysis from the methodology section. The findings are summarized in the conclusion, which addresses the research questions most directly.

2 Literature Review

Private markets serve sophisticated investors, like pension funds, endowments, or high net worth investors and families, with investment options not available on public exchanges. These investors have more technical knowledge and greater access to capital than most individuals. Private investments are less liquid with less readily available financial information. Private markets have many different investment types, including buyout, venture capital, credit, real assets, direct investments, and secondaries (Hamilton Lane, 2023). Many of the terms used in the literature review are defined in the glossary in Appendix 2.

2.1 Secondary Market

The typical commitment to closed ended private equity funds and investments has a long investment horizon, usually ten to twelve years (Hamilton Lane, 2023). One fundamental concern for institutional investors is matching the investment horizon for assets and liabilities. In economic recession, an institutional investor may have a need for liquidity before the disbursement phase of the private fund. Alternatively, a general partner, who manages the investment of the private fund into the portfolio company with committed capital, will propose a secondary transaction to maintain exposure to a high performing asset. Oftentimes, the best performing assets from a fund, the trophy assets, will continue to have upside potential beyond the time horizon of the private fund. The general partner, management team, and approving limited partners will maintain or add to their commitment and allow new limit partners to join this smaller, more concentrated fund, called a continuation vehicle (Woodman, 2021).

The secondary market allows for flexibility for both general and limited partners. There are many reasons to exit a ten-year capital commitment early, including changes in strategy, asset allocation, and the regulatory environment (Burdell, 2009). In general, private markets lack transparency. Therefore, the relationships between limited partners and general partners are very valuable because previously shared information can form the basis for secondary pricing. Limited and general partners who are familiar with one another already have signed

nondisclosure agreements as well as saved information from prior transactions, in my experience. This makes it easier for limited and general partners who already work together to continue to work together in new areas, like secondaries. Private secondaries markets are relatively new, only occurring in the past two decades. In recent years, the transactions have gained more sophistication to creatively solve seller issues (Burdell, 2009). One example of a seller’s issue, from my experience, is that a fund that is distributing returns to investors has a position in a high performing company. The seller knows that he wants to maintain ownership of the asset, but he must distribute and close the existing private fund. Continuation vehicles are one such method of maintaining ownership of the asset.

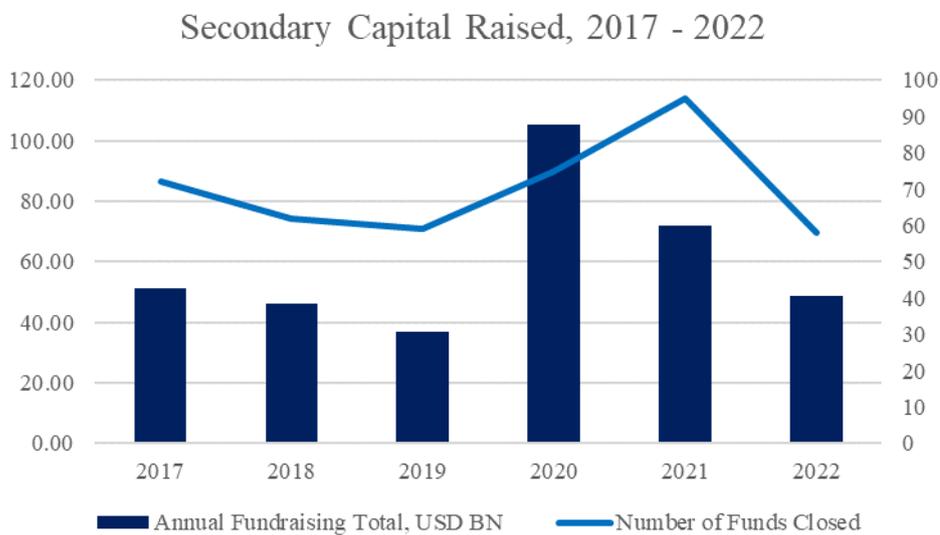


Figure 1. Secondary Capital Raised (*Secondaries Investors*, 2023)

Figure 1 shows the overall size of the private secondaries market. It reached a maximum fundraising in 2020, as the initial pandemic panic caused investors to seek secondary markets to gain liquidity and adjust allocation. This is also reflected in the large number of funds closed in 2020 and 2021. With the ending of the pandemic, high inflation rates, and a recessionary environment coming or upon us, limited partner portfolio trades “were effectively halted” and general partner led deals must “adjust to the new macroeconomic environment” (Graham, Knechtli, and Yan-Staal, 2022).

2.2 GP-led versus LP-led transactions

The information in this subsection is based on my experience working with secondaries for Portfolio Advisors and being taught by my colleagues. Secondaries transactions have two types: general partner led and limited partner led. Limited partner (LP) led transactions are initiated by limited partners who invest in the fund to sell their ownership ahead of the distribution date for liquidity needs or fixing private overallocation due to drops in public markets (Common Fund, 2022). In these transactions, all holdings are sold at a discount, so the limited partner can get the necessary liquidity.

General partner (GP) led transactions are initiated by general partner responsible for the fund's initial investment in the portfolio company. The general partner provides capital and management expertise into the underlying portfolio companies. GP-led transactions occur when the general partner believes the underlying firm has more growth opportunities and requires more time and capital to realize further gains. These transactions can be single or multi-asset but usually focus on the trophy asset or highest performing assets in a fund. The general partner "rolls over" the initial capital commitment and any proceeds from the fund that made the original investment to a continuation vehicle (CV). The limited partners of the fund have the option to roll their interest, take liquidity, or increase commitment. The CV is also brought to market for new limited partners to join the CV (Lussier and Biamonte, 2022). In essence, the ownership stake in the underlying firm is bought by the CV from the initial fund to allow for a longer time investment horizon and additional capital. These terms are also defined in the glossary in Appendix 2.

2.3 Overview of a Continuation Vehicle

This section will discuss the perspectives of each party in a GP-led transaction from the perspective of the relevant parties. My knowledge here comes from my work experience throughout all stages of a secondary transaction, not a particular source.

To begin, the general partner will initiate the transaction. The GP will talk to the management team of the underlying company, or companies in the case of a multi-asset deal, and investment bankers. Typically, this will occur towards the end of the life of the closed ended fund that made the initial investment. If the GP believes that there is an additional growth

runway, then they will initiate the secondary transaction to maintain exposure and add additional capital. The GP is also an investor who has earned a return on investment. The GP will commonly roll over the initial financial commitment plus any returns. They may make an additional commitment to the continuation vehicle, so strong GP commitment will be 100% or greater. The management team of the underlying company is also advised of the upcoming transaction. The management team, like the GP and LPs, have an ownership claim and additional performance incentives, so the management team can also roll over their ownership into the continuation vehicle. The GP and management team rolling over all proceeds plus an additional check signal alignment. Alignment is one of the most important indicators to a new LP who is considering investing in the CV. With money from the GP and management team in the CV, incentives are aligned the people who control how well the underlying company performs to exceed expectations. When the GP and management team does not take liquidity or lessening commitment new and old LPs know the GP and management team remain committed to growing the company.

Limited partners provide capital that is called to be used by the general partner. Old LPs originally invested in the fund raised by the GP. The GP calls capital for the initial investment in the beginning of the life of the fund. After several years, the LPs anticipate distributions from the fund. When a GP-led transaction is announced, existing LPs have the option to take liquidity, rollover ownership, or make an additional commitment. Depending on the liquidity needs and the attractiveness of the underlying asset, the existing LP will make their decision with respect to investment in the continuation vehicle. When a GP-led transaction goes to market, it is also presented to new potential LPs. These LPs, if they invest, will receive ownership in the underlying asset as well as fund an additional amount of unfunded capital. The additional unfunded portion will be used by the GP and management team to fund acquisitions or capital expenditures. At the end of the life of the CV, the returns are distributed by a waterfall where GPs earn a management fee plus a portion of returns above a specific hurdle rate (Ganti, 2022). This also helps with GP alignment with the LPs.

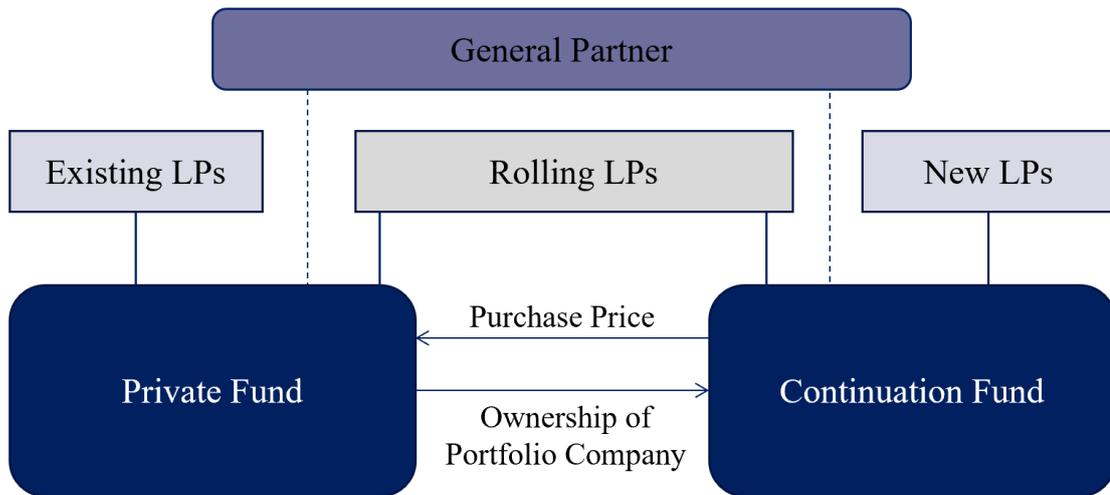


Figure 2. Diagram of a single asset continuation vehicle transaction

Figure 2 shows the typical structure of a single asset CV based on my work experience. The private fund that made the initial investment in the underlying portfolio company receives the purchase price. That cash is then distributed to existing LPs whereas rolling LPs and the GP do not receive cash and instead receive a stake in the continuation fund. The continuation fund receives ownership of the underlying asset, the portfolio company. There would be various tax implications for each of these different parties, especially when the LPs can be internationally diverse. The tax discussion is beyond the scope of my knowledge and this Master's thesis and better left to the appropriate lawyers and accountants (Clark, Ingrasin, and Malone, 2015).

2.4 Financial Outcomes

Private equity investments experience the J curve. This is the immediate, initial loss followed by a curve upwards over time, resulting in a curve that visually resembles a J (Kenton, 2020). It is a visual display that things get worse before they get better. Secondary transactions usually do not have a J curve because limited partners are buying in at a discount. They can immediately write up their holdings to cost, so the J curve is largely diminished or non-existent. This gives institutional investors a more pleasant view in their portfolio, which is a significant selling point for secondaries transactions based on my work experience. Another consideration for institutional investors is concentration. Secondary transactions provide the

option to sell or reinvest for existing LPs. When institutional investors construct ideal portfolio allocation, they try to maintain those weights. In a recession, public markets usually fall quickly. That unrealized loss can result in public markets becoming effectively a smaller percentage of the portfolio than the institutional investor intends. With less public exposure, it appears like private markets or alternative assets are overweighted. This is called the denominator effect (Benchmark International, 2022). To get back to ideal portfolio allocation, institutional investors may need to invest or divest accordingly. For this reason, LPs would value the flexibility to reinvest in a CV or reallocate the liquid funds into different investments. Finally, a CV is usually concentrated in a single asset deal or a multi asset deal, less than four assets in my experience. Therefore, there is company concentration where institutional investors are normally invested in hundreds or thousands of companies. This idiosyncratic risk is another consideration for the institutional investors as both existing and new potential LPs. Finally, one additional benefit of secondaries is that there is no blind pool risk. Blind pool risk is when limited partners invest in a private fund but have no decision making power in investment in particular underlying companies. LPs must trust that they have invested with knowledgeable GPs. With secondaries transaction, the underlying portfolio company is known and can be analyzed on a granular level. This provides more information to existing and new LPs, which is very valuable in a private market context.

2.5 Existing Literature on Private Secondary Transactions

Overall, private secondaries are a novel topic. One relevant peer reviewed article discusses strategic exits in secondary venture capital markets (Andrieu and Groh, 2021). Secondaries, particularly for venture capital, have the useful function of providing liquidity to investors. Venture capital is unique in a few ways from standard private investment. First, the underlying portfolio company is usually new, so there is very little data to project performance. Second, the assets that usually head into a CV are typically trophy assets, or top performing assets, whereas venture capital backed companies can turn out good or bad. If a venture company is a dud, the investor would never liquidate and always choose to engage in a secondary transaction (Andrieu and Groh, 2021, pp. 2-3). Third, a standard venture capital exit is to grow the company to a sufficient size and then have an initial public offering (IPO). These three points are dissimilar to the GP-led secondary market described above.

The secondary venture capital market provides the option to simply divest assets. One would assume that venture capitalists would only divest poor performing companies. If that was the case, there would be no secondary venture market because every available company is a bad investment. The authors, Andrieu and Groh, argue that venture capitalists have a financial constraint, so they must take a strategic exit of good opportunities to invest in better opportunities (Andrieu and Groh, 2021, p. 3). The article continues to explain methodologically that a venture secondary transaction is always preferable to a liquidation. This reasoning is available and applicable for why the larger secondary market continues to exist and grow.

Additionally, another article was published for Canadian investors. It goes through general topics in private equity, like primaries versus secondaries, and various tax implications particular to Canadian investors (Chan and Johnston, 2019). Like the prior article, the total value of the ownership claims of the portfolio company can be less than the net asset value because of the liquidity discount.

2.6 Multiple Criteria Decision Making

The primary challenge for financial decision makers is how to allocate capital to maximize return, while considering a variety of factors. This decision is complex and has impactful financial consequences, so decision makers can rely on mathematical tools and models to support the decision making process and provide some objective comparisons. Colapinto and La Torre apply three models for venture capitalists: a goal programming model with satisfaction function, a stochastic goal programming model with satisfaction function, and a fuzzy goal programming model (2015, pp. 17-19). The venture capital deal screening process is very similar to secondaries. Deals come in and they are initially screened for the deals worth a second look. After that, there is usually a meeting with the investment bank, who serves as the intermediary, as well as the general partner and management team. From there, the financial decision maker collects more financial information to conduct more analysis. Both venture capital and secondary teams are analyzing many deals at once. This provides the opportunity to use a multiple criteria decision making tool. The criteria considered can take many forms: market attractiveness, product differentiation, managerial capabilities, cash out potential, industry, geography, investment size, barriers to entry, and

so on for venture capital deals (Colapinto and La Torre, 2015, p. 11). A similar list of potential criteria can be generated for secondary deals.

	Company	Focus
1	Invest Newco SA	Reseller of hosting space and domain registration
2	Egrocery Newco	Offer both mortgage quotes and links to developers of buy-to-let property investment
3	Mphone Newco S.p.A.	On line financial information
4	Adv Newco S.r.l.	Internet advertising
5	Mmania Newco Ltd.	M-Commerce and E-commerce for the UK mobile market
6	E-Finance Newco S.p.A.	Web design services and Internet financial information
7	Together Newco	On line group buying in Europe
8	Info NewCo Ltd.	Distributors of mobile phone in Germany
9	Mortgage Newco S.A.	On line trading service
10	Mobile Newco Inc.	New technology into web-enabled or SMS-enabled mobile phones

Figure 3. Illustrative Example of Venture Capital Deals (Colapinto & La Torre, 2015, p. 20)

Company	1	2	3	4	5	6	7	8	9	10
Investment return rate	0.15	0.33	0.2	0.1	0.18	0.2	0.3	0.15	0.15	0.09
Survival rate (1 year)	0.84	0.95	0.93	0.94	0.93	0.94	0.95	0.9	0.94	0.93
Intellectual capital	0.1	0.1	0.1	0	0.2	0.2	0.1	0.1	0.2	0.5
Investment risk rate	0.07	0.05	0.03	0.07	0.03	0.07	0.05	0.04	0.07	0.03

Table 1. Illustrative Example of Multiple Criteria Matrix (Colapinto & La Torre, 2015, p. 20)

From Figure 3 and Table 1, you can create a system of equations with the criteria as well as an objective function, that maximizes return or minimizes risk. You can include other constraints, like only accepting a certain number of deals or having an investment budget. From there, a computer software can calculate the most mathematically optimal solutions. Optimization software will calculate the Pareto optimal solution, where it is not possible to improve a single criterion without deteriorating at least one other criteria. Therefore, the solution would be an efficient choice for the venture capital firm to make, supporting the

ultimate decision-making process of the team or manager who is making the investment (Colapinto & La Torre, 2015, p. 13). If I had secondary deal information available, this would be my chosen method. First, I would have a robust criteria matrix. The optimization process with multiple constraints more closely resembles the decision maker's situation. It allows the decision maker and investment team to clearly quantify the relative importance of different criteria and constraints. There may be other, more quantitative, reasons why an investment decision makes more or less sense, but starting with a Pareto optimal solution based on the quantitative criteria is a better starting point than scratch. Due to data availability issues that are discussed elsewhere in this thesis, that is not possible. Therefore, I will use this methodology as the basis for a similar process to compare secondary fund managers for limited partners to invest capital with.

Another potential decision making framework is dynamic multiple criteria decision making, where criteria conflict and the decision making process can evolve over time (Aouni et al., 2015, pp. 32-38). This methodology has the greatest merit when considering complex decisions where the criteria change over the time horizon because of scarce resources. Additionally, this is a useful method when considering multiple, heterogenous decision makers. The primary issue with applying this methodology to secondaries decision making is that it adds complexity without adding a proportionate amount of utility or usefulness for secondary decision making. Using vectors to represent changing criteria values over time adds complexity. More importantly, the decision maker's preferences can be expressed in a simpler model. A financial decision maker's preferences are straightforward, easy to define, and tend to be consistent from one manager to another. All financial decision makers will want to maximize return from each unit of accepted risk in my professional experience. From this perspective, there is not significant heterogeneity between managers. This methodology could provide some interesting results, particularly if different managers were interviewed and there was significant variety of opinions. This seems like an unreasonable assumption without the relevant data, so I won't be considering this for my thesis work. However, it would be an interesting avenue for further research at another point in time.

3 Research Questions

This thesis is targeted at two audiences: academics and industry professionals interested in secondaries. For academics, private secondaries can be a novel topic. The primary purpose of the literature review is to introduce this transaction type, benefits, concerns, and likely financial outcomes. For industry professionals interested in secondaries, there are two types: institutional investors seeking a secondary fund manager and investment professionals who consider secondaries deals. Without access to more data, I cannot demonstrate an application of multiple criteria decision making for investment professionals on a deal-by-deal basis. Since that data is unavailable to me, I will focus on the needs of institutional investors. Secondaries are relatively new, so there is some sorting needed to determine relative rankings among secondary fund managers. Using *Secondaries Investor* and *Amadeus* data, I can construct a decision matrix as the basis of a multiple criteria decision making model.

This model returns a relative ranking of the ten top fundraising fund managers from 2021. Using two performance measures, profit margin and return on equity based on pre-tax profit or loss, I can demonstrate how criteria and performance measures can discern the quality of fund managers. From there, the main research question is:

How can an institutional investor compare potential fund managers?

To support this goal, the following subquestions are considered:

What criteria and performance measures should be considered in comparing fund managers?

What do performance rankings indicate for the relative weight of criteria in a decision matrix?

If performance measures are unavailable, what procedure can an institutional investor conduct to compare fund managers?

With these subquestions answered, there is a robust discussion about the improvements in decision making tools and support available to an institutional investor because of access to private or confidential data.

4 Data

In discussing data, the most important topic is data availability. I am limited in two main ways. First, I no longer work for the GP-led secondaries team at Portfolio Advisors. While I worked there, I had access to dozens of active deals and hundreds of old deals. I would have been able to compile a sizable and robust decision matrix. It would have private information, like the gross and net internal rate of return (IRR) and multiple on invested capital (MOIC) which are two most important and most common performance measures. Internal rate of return considers the time value of money in calculating when money is invested and returned to the client. Multiple on invested capital is the total return of an investor's dollars over the life of the investment (Crystal Capital Partners, 2021). I would also have access to specifics on the underlying company because each deal sent a deal preview and a confidential information memorandum (CIM). The CIM, in particular, has specific information about the deal, the underlying company, the GP, and the management team. When I worked at Portfolio Advisors, they had made approximately 8 – 10 investments in the GP-led secondaries fund. From there, I would have the data for a robust decision matrix and knowledge about the outcomes. If I had my same data availability, I would be able to perform this multiple criteria decision making analysis on a deal by deal basis. For investment professionals who are currently working in a secondaries team, they would have this data available, and it would be a great way to implement a more refined and technical analysis for what deals get passed quickly versus deals that merit more consideration. Without that data, my methodology and results must pivot to analyze data that is available.

My second limitation is private markets are generally opaque with respect to data transparency. They have fewer reporting requirements and very few necessary public disclosures. To have access to private data, you usually need to work at an investment bank or private equity firm, so you can have the nondisclosure agreements signed and establish appropriate communications with the relevant parties. For a private individual, like someone working on her Master's thesis, I have access to my university's resources and various free trial subscriptions. *Secondaries Investor* is a useful resource for investment professionals who work with secondaries deals, both GP-led and LP-led, as well as people who are interested in learning more about secondary transactions. *Secondaries Investor* report on news, fundraising, regulation changes, and deal closings on their website and email

newsletter. *Secondaries Investor* also has a database and publishes reports. They publish the top 50 fundraisers for each year (which has become just the 50 largest investment banks and private equity firms as they add a secondaries team). They also publish information about the size of the secondary market, including how much capital has been raised and how many funds have closed. They have a robust database of LP and GP-led deals, funds, firms, and more. My biggest challenge is that the best data is behind a significant paywall, costing 3,145 USD for the lowest tier subscription. If an investment professional had access via his or her company, he or she would be able to perform this analysis to compare and contrast secondary funds to one another. There would be more than enough data because *Secondaries Investor* had over 400 entries for GP-led funds including 140 that were actively fundraising as of February 2023. The *Secondaries Investor* database also represents the most comprehensive list of all secondary fund managers. Conclusions with this dataset would be generally applicable and persuasive in decision making support. *Secondaries Investor* also has performance measures, like IRR, MOIC, and total value to paid in (TVPI), so you can see how the funds are relatively ranked and you can make a conclusive statement about which funds are the best because you have all the funds and performance measures to allow for absolute evaluation. Absolute evaluation is a type of ranking that compares alternatives to a known standard. The standard can be established by firm policy, expert opinions, or other research methods. If the alternative exceeds the standard or not, then that information is useful to the decision maker. For relative evaluation, alternatives are compared to other available alternatives. Relative evaluation relies on comparing alternatives through aggregation methods, like weighted averages or another rule that can be constructed by the decision maker. (Analyst Notes, 2023)

The data I have available to me come from two sources: *Amadeus*, a database of financial information for public and private companies across Europe, and my free trial of *Secondaries Investor*. I began with *Secondaries Investor* list of the top 10 largest funds that closed in 2022 (Figure 4 below).

Fund Manager	Target Size (\$bn)	Current Size (\$bn)	Fund Strategy	Region focus
Intermediate Capital Group	5	5.3	Secondaries	Multi-regional
Ardian	4	5.25	Secondaries	Multi-regional
Neuberger Berman Private Markets	3	4.9	Secondaries	Multi-regional
Pomona Capital	2	2.6	Secondaries	Multi-regional
StepStone Group	Undisclosed	2.6	Secondaries	North America
Landmark Partners	6	2.4	Secondaries	Multi-regional
Hollyport Capital	1.5	2	Secondaries	Multi-regional
Ardian	Undisclosed	2	Secondaries	Multi-regional
LGT Capital Partners	1	1.65	Secondaries	Asia-Pacific
Adams Street Partners	Undisclosed	1.1	Secondaries	Multi-regional

Figure 4. Ten largest funds closed in 2022 (*Secondaries Investor*, 2023)

Analyzing this list, you can see that the largest secondary funds, on average, exceeded their target size by 22.5% when the target size is stated. Only one fund out of seven did not reach its disclosed target size. Multiregional is the most common geographical focus, likely focusing on deals in the US and EU from my prior experience. However, more geographically focused funds can also have a significant fundraise, like StepStone Group and LGT Capital Partners. This provides more options to attracting LPs who may or may not want a multiregional focus. From there, I searched the *Amadeus* database for these ten firms and collected the key financial information.

Firm	Ardian	Neuberger Berman Private Markets
FYE	12/31/2021	12/31/2021
Currency	EUR	EUR
Operating revenue (Turnover)	533,479,938	203,757,471
P/L before tax	84,420,571	28,453,386
P/L for period [= Net Income]	54,578,799	25,753,596
Cash flow	57,416,846	26,513,323
Total assets	241,964,412	144,435,698
Shareholders funds	87,795,364	70,715,044
Current ratio (x)	1.62x	1.83x
Profit margin (%)	15.825	13.964
ROE using P/L before tax (%)	96.156	40.237
ROCE using P/L before tax (%)	67.48	n.a.
Solvency ratio (Asset based) (%)	36.284	48.96
Number of employees	382	211

Figure 5. Key financial information (*Amadeus*, 2023)

Figure 5 is an example of the *Amadeus* data collected for the ten firms mentioned earlier. To keep the data as consistent as possible, I recorded the entries for 2021. It was the fiscal year

with the most data entries. The financial information has information from the balance sheet and income statement as well as some performance measures, like the profit margin and return on equity. This data serves as the basis for further analysis. Where applicable, I also recorded the financial information for prior years.

	Min	Median	Mean	Max	Standard Deviation
Operating Revenue	3,378,853	28,032,216	145,780,453	533,479,938	212,897,001
Net Income	(12,986,828)	4,152,711	14,654,994	54,578,799	23,415,366
Current Ratio	.52x	1.56x	1.52x	2.69x	.58x
Profit Margin	-20%	12%	16%	60%	25%
ROE using P/L before tax	4%	41%	99%	493%	163%
Solvency Ratio	-47%	36%	28%	65%	31%
Number of Employees	15	161	1,391	11,259	3,703

Figure 6. Descriptive statistics for collected *Amadeus* data

From the descriptive statistics, the firms are well performing and have a positive skew towards large companies. For operating revenue, net income, and number of employees, the mean is much greater than the median indicating a very strong positive skew. The top ten secondary fundraisers do more than only secondaries; they offer the entire range of private equity solutions for institutional investors. Therefore, the number of employees, revenue, and income agglomerate the revenue streams from all forms of business. This is not a problem in my analysis because platform investments, investing in the same fund manager for primaries, secondaries, and real estate, is the industry norm from my experience at Portfolio Advisors. Platform investing and its implications are also discussed in the results section. Additionally, many of these firms have subsidiaries in different countries. Where possible, I used the information of the parent company or the global owner of the subsidiary. For firms with a more generic name, I searched their corporate website to find the headquarter location and picked the *Amadeus* entry that matched the same city. The *Amadeus* key financial information forms the criteria and entries within the decision matrix. A decision matrix will be defined later in the Methodology section.

There are some ways to make the decision matrix more suitable for further analysis. First, Ardian is in the decision matrix twice because it raised two large funds in 2021. For an institutional investor, they must choose the fund manager to invest in and then enter the fund that is being raised at the time. Therefore, Ardian should only count as one fund manager, reducing the number of potential fund managers to nine. Then, target size and current size should be removed from the decision matrix. In my professional experience, fund managers

will always accept new money into any open fund, so the amount of money being sought or raised is not a concern. So, the target size and current size criteria provides no value to institutional investors looking to differentiate between fund managers.

Further tweaks needed because of significant outliers in the data or data that had to be collected through another source. *Amadeus* did not have data for the number of employees at Hollyport Capital, but they have 42 employees on LinkedIn, so I made that substitution in the decision matrix. Pomona Capital has thousands more employees than any other fund manager, which creates an enormous positive skew in the data. I adjusted the number of employees working at Pomona Capital to the number of investment professionals (managing directors, vice presidents, associates, and analysts) in their three offices (New York, London, and Hong Kong) from their corporate website. This information revised Pomona Capital from 11,259 to 36 employees, which is much more in line with other fund managers. Ardian, the next largest fund manager, is justified in having 382 investment professionals. From the Ardian website, they have 240 investment professionals who are senior investment managers or above. Then, 382 is a reasonable number of investment professionals considering senior staff and junior staff, like analysts. From a brief review of the websites of other fund managers, the number of employees is reflective of the number of investment professionals at the firm.

Fund Manager	P/L for period	Current ratio	Solvency ratio (Asset based)	Number of employees
Intermediate Capital Group	1,138,885	1.22x	22.0%	21
Ardian	54,578,799	1.62x	36.3%	382
Neuberger Berman Private Markets	25,753,596	1.83x	49.0%	211
Pomona Capital	37,085	1.17x	35.6%	36
StepStone Group	655,577	2.69x	64.7%	67
Landmark Partners	(12,986,828)	.52x	-47.1%	161
Hollyport Capital	15,475,671	1.14x	12.4%	42
LGT Capital Partners	151,823	1.49x	20.3%	21
Adams Street Partners	7,166,537	1.93x	49.5%	15

Figure 7. Resulting decision matrix after revisions (*Amadeus* and *Secondaries Investor*)

This adjusted decision matrix in Figure 7 is used for the multiple criteria decision making model discussed in the next section.

5 Methodology

In general, the methodology relies on the coursework from Advanced Decision Making (A220A0550) and Colapinto and La Torre's published work (2015, pp. 12-16, 20-21). Complex decisions, like what deals to spend more time on or what private equity fund to invest with, require careful consideration from financial decision makers. These decisions can be made with certainty or ignorance, specifically referencing if the decision maker knows the appropriate criteria value for each alternative. The decision matrix uses the *Secondaries Investor* list and *Amadeus* data as the basis for the criteria and criteria values. That matrix is available in Appendix 1.

5.1 Universal Standardization Method

In general, every criterion has a different range in the decision matrix. For example, asset-based solvency ratio, expressed as a percentage, had a value between 10% and 65%. On the other hand, profit or loss for the period had a much larger range, from a 13M EUR loss to a 65M EUR profit. Therefore, we must standardize the values in the decision matrix to make the alternatives more comparable. Each column of the decision matrix is a criterion. The criterion can be a cost-type or benefit-type. For a benefit-type criteria, if the criteria value is higher, that is better, like profit. For a cost-type criteria, if the criteria value is higher, that is worse, like the amount of fees. Based on criteria type, the standardization equation can be different. All the criteria in this decision matrix are benefit-type. Appendix 1 has the full decision matrix with the collected 2021 data. For benefit type criteria,

$$b_i = \frac{x_i - \bar{x}_j}{sd_j} \text{ where } b_i \text{ is the universally standardized criteria value, } x_i \text{ is the original criteria value for the } i^{th} \text{ alternative, } \bar{x}_j \text{ is the criteria average for the } j^{th} \text{ criterion,} \quad (1)$$

and sd_j is the criteria standard deviation for the j^{th} criterion

For cost-type criteria,

$$c_i = \frac{\bar{x}_n - x_m}{sd_n}$$
 where c_i is the universally standardized criteria value, x_m is the original criteria value for the m^{th} alternative, \bar{x}_n is the criteria average for the n^{th} criterion, and sd_n is the criteria standard deviation for the j^{th} criterion (Stoklasa, 2016, p. 6)

Universal Standardization	Min	Max	Hurwitz (0.3)	Hurwitz (0.8)
Intermediate Capital Group	0.00	1.00	0.30	0.80
Ardian	0.03	1.00	0.32	0.81
Neuberger Berman Private Markets	0.02	0.90	0.28	0.73
Pomona Capital	0.02	1.00	0.32	0.80
StepStone Group	0.00	1.00	0.30	0.80
Landmark Partners	0.00	0.31	0.09	0.25
Hollyport Capital	0.21	1.00	0.45	0.84
Ardian	0.03	1.00	0.32	0.81
LGT Capital Partners	0.00	0.60	0.18	0.48
Adams Street Partners	0.00	1.00	0.30	0.80

Figure 8. Universal Standardization with each criterion's maximum and minimum values

Finally, universal standardization is especially useful because it makes the range of all the criteria the same, between 0 and 1. Once the decision matrix is standardized, different methods can be implemented to get different relative rankings. From there, Figure 8 records the maximum and minimum value for each alternative. From a risk averse perspective, an institutional investor would select the alternative with the greatest value in the "Min" column, because it has the lowest potential loss. In this case, the best alternative is Hollyport Capital. Alternatively, a risk seeking institutional investor would prioritize the alternative with the greatest value in the "Max" column because it has the most potential upside. Seven fund managers have the maximum possible value in this column. Another option is the Hurwitz criterion. For the Hurwitz criterion, the institutional investor would select an optimism parameter, between zero and one, and calculated a weighted average of the minimum and maximum values using the parameter. I have shown the Hurwitz criterion with two optimism parameters, 0.3 for more conservative investors and 0.8 for more risky investors. For both the 0.3 and 0.8 optimism parameter, the best choice is Hollyport Capital.

With this standardization method, it is clear that Hollyport Capital has the highest possible max and the greatest min, so Hollyport Capital dominates all other alternatives. Seven fund managers have the highest possible value in the "Max" column. However, Hollyport Capital has the greatest minimum. Given the choice, a reasonable investor would never choose to

take on more risk, by selecting a fund manager with a lower “Min” value for the same upside potential. Hollyport Capital also is the highest for both optimism parameters of the Hurwitz criteria.

5.2 Decision Matrix

Decision matrices are useful tools in comparing alternatives and ranking them. A decision matrix is a $m \times n$ matrix where m is the number of alternatives and n is the number of criteria. A decision matrix evaluates and prioritizes a list of alternatives. The analyst should create a list of criteria, then fill out the interior of the matrix with the criteria values for each alternative. Each alternative can be evaluated using weighted criteria or another method. (The Quality Toolbox, 2023) A decision matrix only gives relative evaluation, comparing alternatives to one another depending on standardization and aggregation methods. Without other measures, like performance, you cannot definitively state if the highest ranked alternative is a “good” choice. In this case, we have a firm-level performance measure, return on equity using the profit and loss statement before tax. With performance measures, there is sufficient data to suggest absolute evaluation. With absolute evaluation, a decision maker can determine if the best ranked alternative meets the minimum acceptable standard of performance. If the alternative exceeds the performance standard, then it should be chosen, and the decision maker can feel confident he or she is making a “good” choice (Analyst Notes, 2023).

Fund Manager	P/L for period	Current ratio	Solvency ratio (Asset based)	Number of employees
Intermediate Capital Group	1,138,885	1.22x	22.0%	21
Ardian	54,578,799	1.62x	36.3%	382
Neuberger Berman Private Markets	25,753,596	1.83x	49.0%	211
Pomona Capital	37,085	1.17x	35.6%	36
StepStone Group	655,577	2.69x	64.7%	67
Landmark Partners	(12,986,828)	.52x	-47.1%	161
Hollyport Capital	15,475,671	1.14x	12.4%	42
LGT Capital Partners	151,823	1.49x	20.3%	21
Adams Street Partners	7,166,537	1.93x	49.5%	15

Figure 9. Revised decision matrix (*Amadeus* and *Secondaries Investor*)

This adjusted decision matrix in Figure 9 is used for the multiple criteria decision making model after revisions discussed in the Data section. With the original values, one can see some clear trends. For instance, Landmark Partners is a poor performing fund manager

because it is the one with a loss for the period, negative solvency ratio, and current ratio below one. Trying to compare other fund managers is trickier, so the data must be standardized (described prior).

Universal Standardization	P/L for period	Current ratio	Solvency ratio (Asset based)	Number of employees
Intermediate Capital Group	0.209	0.324	0.617	0.016
Ardian	1.000	0.509	0.746	1.000
Neuberger Berman Private Markets	0.573	0.606	0.859	0.534
Pomona Capital	0.193	0.301	0.740	0.057
StepStone Group	0.202	1.000	1.000	0.142
Landmark Partners	0.000	0.000	0.000	0.398
Hollyport Capital	0.421	0.286	0.532	0.074
LGT Capital Partners	0.194	0.449	0.603	0.016
Adams Street Partners	0.298	0.652	0.864	0.000

Figure 10. Decision matrix with Universal Standardization

Universal standardization in Figure 10 was selected because it forces the range for each criterion between zero and one. This is much easier to compare visually and compute. Continuing on, we will develop rankings based on equally weighted criteria and performance measures.

5.3 Criteria

A decision matrix can be used to compare alternatives for relative evaluation with a predetermined set of criteria. The *Amadeus* database has four variables that are inputted as criteria in the decision matrix: profit or loss for the period, current ratio, asset-based solvency ratio, and number of employees, and two performance measures, profit margin and return on equity based on the pre-tax profit or loss. This data is accessible from the *Amadeus* database key financials section. I propose that institutional investors would have equally weighted preference for the four criteria, which will be discussed later in the Weights section. Strong profits for the fiscal year are a positive sign. Current ratio, which is current assets divided by current liabilities, is a measure of liquidity and another benefit type criteria. Asset based solvency ratio is the difference between assets and liabilities divided by assets. Alternatively, it is shareholder's equity divided by assets. Solvency is useful for institutional investors because a higher solvency ratio shows that the fund manager's cash flow is sufficient to meet its long and short term liabilities. It is a strong signal of the financial health of the fund manager. Finally, the number of employees is the last criteria. In my professional

experience, having more employees, especially more investment professionals, is better because they can see more deals and pick the best secondary transactions because they have the manpower and the time.

In considering absolute evaluation, it requires performance data to determine if the highest ranked alternatives meet the specified hurdle rate for sufficient performance. Secondaries teams would have access to specific performance data for general partners and underlying companies. Without that data, I cannot do the same analysis. Instead, I will use two measures I have, profit margin, and return on equity from the profit and loss statement, as measures of performance and use similar methodology on accessible data.

5.4 Weights

The last important consideration in multiple criteria decision making is the weights and aggregation method. Weights summarize the relative importance of each criterion. In calculating the alternative's evaluation, each criterion's value is multiplied by its weight and summed. If the decision maker has a preference that can be presented in terms of constraints, then there would be another method to aggregate evaluations for each alternative. For instance, a decision maker can decide that a current ratio below 1.0x is unacceptable. In that case, a fund manager can have the highest weighted ranking because of the strength of the other criteria, but fail the current ratio, so that fund manager should not be considered further.

To determine appropriate weights, I used the solver package in Excel. My motivation for using solver is to validate my assumption that equally weighted criteria most closely resembles profit margin ranking. This is important because if profit margin for a particular fund manager was not available, then equally weighted aggregation and ranking could be a proxy. Additionally, the solver confirms that all of the criteria are important. If one of the criteria had an optimized weight of zero, then I would remove that criterion from analysis. It does not make sense to use time and energy collecting criteria data if it has no impact on aggregation and relative rankings.

Weights	0.250	0.250	0.250	0.250		
Universal Standardization	P/L for period	Current ratio	Solvency ratio	Employees	PM Ranking	Weighted Ranking
Intermediate Capital Group	0.209	0.324	0.617	0.016	5	8
Ardian	1.000	0.509	0.746	1.000	3	1
Neuberger Berman Private Markets	0.573	0.606	0.859	0.534	4	2
Pomona Capital	0.193	0.301	0.740	0.057	7	6
StepStone Group	0.202	1.000	1.000	0.142	6	3
Landmark Partners	0.000	0.000	0.000	0.398	9	9
Hollyport Capital	0.421	0.286	0.532	0.074	1	5
LGT Capital Partners	0.194	0.449	0.603	0.016	8	7
Adams Street Partners	0.298	0.652	0.864	0.000	2	4

Table 2. Excel setup for Solver

The basis for the solver set up are the universally standardized criteria values and profit margin ranking. An intermediate calculation column, not shown, calculates the sum product of the criteria weights and values. The weighted ranking column returns the ranking for each alternative. Using Excel Solver, I set the objective function to minimize the difference between the profit margin ranking (PM Ranking) and weighted ranking. The formula for the objective function is:

$$\min(\sum_{i=1}^n r_i - p_i) \text{ where } r_i \text{ is the weighted ranking and } p_i \text{ is the profit margin ranking} \quad (3)$$

Profit margin ranking was selected because it is a performance measure, and it has no missing values. The variable cells are the yellow highlighted weights. Those weight cells are connected to the weighted ranking. The last constraint is that the sum of the weights should equal 1. With these constraints and the GRG Nonlinear solver, the solver returned equal weights in the yellow highlighted cells. For completeness, I ran the same analysis but only considered the difference for the top three fund managers in the profit margin ranking. Considering only the top three fund managers, the results were the same and the solver returned equal weights. Manually checking with some other weight choices, I could validate the solver is correct that equal weights minimize the difference between the weighted ranking and profit margin ranking. Therefore, equal weights will be used in the rest of the analysis.

6 Results

From the optimization calculation described earlier, using equally weighted criteria would result in a ranking that most closely resembles the ranking by profit margin. Equally weighted aggregation is still useful because it can be used to compare a new fund manager that gets added to the sample. Also, information about the criteria can describe indicators for performance. Finally, equally weighted is one aggregation method. It can be combined with a green or red flag criteria, which can automatically make an alternative more or less attractive based on the preference of the decision maker.

Universal Standardization	Equal Weighted	Ranking
Intermediate Capital Group	0.292	8
Ardian	0.814	1
Neuberger Berman Private Markets	0.643	2
Pomona Capital	0.323	6
StepStone Group	0.586	3
Landmark Partners	0.099	9
Hollyport Capital	0.328	5
LGT Capital Partners	0.316	7
Adams Street Partners	0.453	4

Figure 11. Output from equally weighted criteria and relative rankings

The equally weighted results and rankings consolidates the criteria information in the previous decision matrix in Figure 11. The results support our earlier conclusions, like Landmark Partners are the worst fund manager out of the sample. Conversely, the best fund manager is Ardian. This is because it had the maximum values for profit for the period and number of employees. These are both criteria that would be high because Ardian is the largest company, which is why performance data is important to consider. The next highest ranked fund manager is Neuberger Berman Private Markets, performing well in all criteria especially solvency ratio.

Universal Standardization	Profit margin	ROE using P/L pre-tax	PM Ranking	ROE Ranking
Intermediate Capital Group	9.4%	42.1%	5	3
Ardian	15.8%	96.2%	3	2
Neuberger Berman Private Markets	14.0%	40.2%	4	4
Pomona Capital	2.2%	14.4%	7	5
StepStone Group	2.2%	4.7%	6	6
Landmark Partners	-19.9%	n.a.	9	n.a. Bad
Hollyport Capital	60.0%	n.a.	1	n.a. Good
LGT Capital Partners	1.4%	3.7%	8	7
Adams Street Partners	59.4%	492.8%	2	1

Figure 12. Performance outputs and rankings

Figure 12 summarizes the performance measures and ranks them respectively. Considering this figure's information, Adams Street Partners has the best performance for return on equity and second best for profit margin. *Amadeus* did not have pre-tax return on equity for two firms: Landmark Partners and Hollyport Capital. Therefore, I extrapolated what the return on equity ranking would be, but I cannot assign a numerical value because I lack the data to make a precise estimate. Instead, I indicate that Landmark Partners would have a poor ranking because of the negative profit margin and poor performance for other criteria. On the other hand, I assume Hollyport Capital would be one of the better rankings because it has the highest profit margin and performs decently well in the underlying decision matrix. Hollyport Capital and Adams Street Partners have almost identical profit margins, so Hollyport Capital could exceed Adams Street Partners in performance measures, but without the data, a conclusion cannot be drawn one way or another.

Universal Standardization	Equally Weighted Ranking	Average Performance Ranking
Intermediate Capital Group	8	4
Ardian	1	2.5
Neuberger Berman Private Markets	2	4
Pomona Capital	6	6
StepStone Group	3	6
Landmark Partners	9	n.a. Bad
Hollyport Capital	5	n.a. Good
LGT Capital Partners	7	7.5
Adams Street Partners	4	1.5

Figure 13. Equally weighted ranking and average performance ranking

Figure 13 consolidates the equally weighted ranking of the four criteria and averages the performance measure rankings. Like Figure 12, lack of data availability forces a substitution for the performance rankings for Landmark Partners and Hollyport Capital. The two most

interesting cases to look at are Ardian and Adams Street Partners. They have the top two performance rankings, but rank 1 and 4 for the equally weighted criteria ranking, respectively.

Ardian is the largest company in this sample, in terms of annual profit and number of employees. Ardian also had the fourth best solvency ratio and average current ratio. These are all indicators of a high performing, financially strong fund managers. As I mentioned earlier, Ardian had two of the top ten largest secondaries fundraises in 2021. Therefore, Ardian stands out as a fund manager, particularly for institutional investors who want a reputable choice with adequate manpower for deal selection and client relations.

Adams Street Partners is the top performing fund manager, measured by profit margin and pre-tax return on equity. However, it was the fourth best choice for an equally weighted ranking of criteria of the decision matrix. Adams Street Partners is the smallest fund manager, by number of employees. Therefore, it has a lower profit for the period, but the second highest current ratio and solvency ratio. This speaks to a company that is very efficient. With less than 10% of the employees of Ardian, Adams Street Partners outperforms every other fund manager with fewer employees. Adams Street Partners would be a good fund manager for an institutional investor who seeks to be an early investor in up and coming fund managers with a proven track record.

The top performers, Ardian and Adams Street Partners, demonstrate two different strategies for institutional investors to choose from. Institutional investors can pick the larger, more reputable Ardian or the efficient Adams Street Partners. Both are good options. Oftentimes, institutional investors will meet with the investment professionals and those relationships will determine if an institutional investor commits capital and how much.

Ardian and Adams Street Partners are top performers. Landmark Partners is the worst performer. The results are mixed for the rest of the fund managers. The third and fourth best performing fund managers, Neuberger Berman Private Markets and Intermediate Capital Group, had very different equally related rankings (2nd and 8th). Hollyport Capital, which would likely be grouped with Neuberger and Intermediate Capital Group, was equally weighted ranked fifth. Intermediate Capital Group and Hollyport Capital have fewer employees, low profit for the period, low current ratios, and middle of the road solvency ratios compared to the other fund managers. Neuberger Berman Private Markets was middle

of the road for profit for the period, current ratio, number of employees, and a high solvency ratio. This suggests that smaller firms will have lower ranking from the decision matrix, unless they are extremely efficient like Adams Street Partners.

The final grouping of fund managers had the lowest performance, Pomona Capital, StepStone Group, and LGT Capital Partners. These firms had middle of the road values for number of employees, current ratio, and solvency ratio. However, they all had low profits for the last period; less than one million euros in all three cases. This lack of profit is why they had low profit margins and poor return on equity using pre-tax profit or loss. This shows that top line profit (from the profit and loss statement) can be a useful heuristic for institutional investor. If a fund manager has a profit for the last period less than one million euros, they will not have strong performance.

6.1 Backtesting for Validity

Summarizing the results from the 2021 data creates this list of testable statements:

- Successful Firm Type 1: Large and reputable firm with large number of employees and profit for the period
- Successful Firm Type 2: Very efficient firm with few employees, but high profit for the period as well as high current and solvency ratio
- Low Performance Firm Type 1: A firm with fewer employees will have lower performance rankings
- Low Performing Firm Type 2: A firm with less than one million euros in profit will have lower performance rankings

To attempt test for validity, we must work within the confines of data availability. I will perform similar analysis using prior data to determine if the testable statements above are supported by earlier data. *Amadeus* database does not have key financial information for all nine fund managers for all recent fiscal years.

Year	Number of Fund Managers
2022	3
2021	9
2020	8
2019	8
2018	8
2017	6
2016	4

Figure 14. Data availability in *Amadeus* database

From Figure 14, financial information was most available for 2021, which is why it is the basis for analysis and results. The model cannot be validated with 2022 criteria and performance measures because we do not have data for all, or even half, of the fund managers. To attempt to establish validity for the model and conclusions, we will backtest using key financial information from 2018. The fiscal year ending in December 31, 2018 is chosen because it had the most data available for the fund managers and is the furthest away in time. Backtesting is not the most ideal method of validating a model because strategies that do well in 2021 may not do well in 2018 or vice versa. With the data available, it is the best method available for testing validity.

Fund Manager- 2018	P/L for period	Current ratio	Solvency ratio (Asset based)	Number of employees
Intermediate Capital Group	854,812	3.43x	72.1%	12
Ardian	22,870,174	1.9x	41.4%	263
Neuberger Berman Private Markets	28,987,847	1.82x	45.9%	225
Pomona Capital	41,956	1.12x	35.0%	39
StepStone Group	975,822	1.69x	0.0%	45
Landmark Partners	5,560,513	.97x	12.7%	217
Hollyport Capital				
LGT Capital Partners	187,383	1.47x	31.5%	13
Adams Street Partners	1,405,928	2.69x	0.0%	13

Figure 15. Fund manager data from *Amadeus* database in 2018

To discuss data quality, there are two major issues. First, there is no Hollyport Capital data available. Second, Adams Street Partners and StepStone Group have zero percent solvency ratio because it is calculated as shareholder's equity divided by assets and the shareholder's equity listed in *Amadeus* is zero. So, this criteria is zero and return on equity using the profit and loss statement before tax cannot be calculated because it uses shareholder's equity in the denominator. One of the four criteria and one of the two performance measures do not accurately reflect the financial health or ability of the fund managers. Therefore, they should be excluded from further analysis.

Fund Manager- 2018	P/L for period	Current ratio	Solvency ratio (Asset based)	Number of employees
Intermediate Capital Group	854,812	3.43x	72.1%	12
Ardian	22,870,174	1.9x	41.4%	263
Neuberger Berman Private Markets	28,987,847	1.82x	45.9%	225
Pomona Capital	41,956	1.12x	35.0%	39
Landmark Partners	5,560,513	.97x	12.7%	217
LGT Capital Partners	187,383	1.47x	31.5%	13

Figure 16. Adjusted decision matrix from *Amadeus* data

Figure 16 is the resulting decision matrix from the mentioned exclusions. It is not an ideal solution because the sample size decreased from eight to six fund managers. Regardless, the analysis continues with universal standardization.

Universal Standardization- 2018	P/L for period	Current ratio	Solvency ratio (Asset based)	Number of employees
Intermediate Capital Group	0.028	1.000	1.000	0.000
Ardian	0.789	0.375	0.484	1.000
Neuberger Berman Private Markets	1.000	0.346	0.559	0.849
Pomona Capital	0.000	0.058	0.375	0.108
Landmark Partners	0.191	0.000	0.000	0.817
LGT Capital Partners	0.005	0.202	0.316	0.004

Figure 17. Universally standardized decision matrix with 2018 *Amadeus* data

Universal standardization forces all of the criteria values between one and zero, which makes them more comparable. However, there are no clear conclusions to be drawn from the matrix as it is.

Universal Standardization- 2018	Equally Weighted	Ranking
Intermediate Capital Group	0.507	3
Ardian	0.662	2
Neuberger Berman Private Markets	0.688	1
Pomona Capital	0.135	5
Landmark Partners	0.252	4
LGT Capital Partners	0.132	6

Figure 18. Rankings from equally weighting the criteria values

From the equally weighted criteria perspective, there are two subgroups within the sample: the top three with equally weighted criteria above 0.5 and the bottom three with equally weighted criteria at 0.25 and below.

Fund Managers- 2018	Profit margin	ROE using P/L before tax	PM Ranking	ROE Ranking
Intermediate Capital Group	10.5%	37.2%	2	4
Ardian	9.9%	42.5%	3	3
Neuberger Berman Private Markets	13.0%	58.2%	1	2
Pomona Capital	2.0%	17.2%	6	5
Landmark Partners	6.7%	58.6%	4	1
LGT Capital Partners	2.8%	7.0%	5	6

Figure 19. Performance measures and rankings with *Amadeus* data in 2018

The performance measures and rankings show that a high ranking in profit margin ranking will tend to result in a high ranking in return on equity. This trend is disrupted by Landmark Partners, which has the highest return on equity ranking, but a relatively poor profit margin ranking.

Fund Managers- 2018	Equally Weighted Ranking	Average Performance Ranking
Intermediate Capital Group	3	3
Ardian	2	3
Neuberger Berman Private Markets	1	1.5
Pomona Capital	5	5.5
Landmark Partners	4	2.5
LGT Capital Partners	6	5.5

Figure 20. Equally weighted rankings and average performance rankings

The first takeaway from Figure 20 is that there is more consistency between the top rankings and bottom rankings in the 2018 data than the 2021 data. Neuberger Berman Private Markets is the top with criteria ranking and performance ranking. Pomona Capital and LGT Capital Partners were the bottom two criteria ranks and bottom two performance ranking.

Neuberger Berman Private Markets fits into the Successful Firm Type 1 mold. It is the company with the most employees and the highest profit for the period. Looking at the next two highest fund managers, Ardian is also a large firm, but with less efficiency, meaning more employees and less profit than Neuberger. Intermediate Capital Group fits into the Successful Firm Type 2 with twelve employees earning over 800,000 euros in profit. Pomona Capital and LGT Partners, the bottom ranked fund managers, supports Low Performing Firm Type 2, where fund managers who earn less than one million euros will do worse. Intermediate Capital Group was also less than one million, but much more efficient in other areas. This suggests that the cut-off to differentiate a probably successful from a probably low performing fund manager should be less than one million euros profit. This data supports a cut-off between 800,000 and 600,000 euros, which would also capture low

performers for 2021 data. The 2018 data does not support Low Performance Firm Type 1 that firms with fewer employees will have lower performance rankings. The number of employees and profit for the period needs to be considered together to get an idea of how efficient a fund manager is with employees. Therefore, a low number of employees is not a negative signal to institutional investors, but rather more work needs to be done to determine how much profit a fund manager usually outputs per employee.

6.2 Summary of Analysis Procedure

While I am limited in my data, the process of analysis can be applied by industry professionals with more data access. Based on my experience, limited partners prefer to invest with fund managers with prior relationships. Fund managers will offer fund that focus on primary investments, secondaries, real estate, infrastructure, co-investment, and more. A limited partner can invest with same fund manager for multiple strategies; this is called platform investing. In this case, a limited partner would have much more information about a fund managers performance and historical track record. In this case, a limited partner can construct a decision matrix and performance measures with the most possible information. New fund managers often reach out to limited partners and limited partners consider committing capital and starting a new investment relationship. This is the situation where the methodology in this thesis would be useful.

Based on my professional and analytical experience, I will present how a limited partner can apply the methodology from this thesis to make a more informed investment decision. First, a limited partner has fund managers with existing relationships as well as new fund managers seeking capital. Based on my work experience, limited partners receive information on fund managers that can form the basis for criteria and performance measures. Possible criteria are geographical focus, size of the underlying companies, industry, number of investment professionals, and so on. Performance measures include internal rate of return, multiple on invested capital, and fees (these terms are defined earlier).

	Criteria 1	C 2	C 3	...	Performance Measure 1	PM 2	PM 3	...
Fund Manager 1								
Fund Manager 2								
Fund Manager 3								
Fund Manager 4								

Figure 21. Illustrative example of a decision matrix

If performance measures are known, then they should be used as the basis for relative evaluation. Limited partners know their internal hurdle rates for different investments. Based on my experience, a limited partner decides that they will only invest in fund managers that have at least a 20% internal rate of return and 2 times multiple on invested capital. Relative ranking would still be useful, because a limited partner can select the top alternatives, assuming multiple fund managers pass that hurdle (which would be an absolute type evaluation).

Next, an analyst can set up an Excel sheet for solver. Using the sum product function, create an intermediate column that sums the product of the criteria value and weight for each fund manager. Then, get the rank for each fund manager. Take the difference between the weighted ranking and a performance measure ranking, like internal rate of return or multiple on invested capital ranking. Set the objective function to minimize the difference in those two rankings. Then, add a constraint so the sum of the weights is equal to one. Then, run Excel solver with GRG Nonlinear. The solver will return the optimal weights.

With the optimized weights, the limited partner can consider any new fund managers or fund managers with incomplete data. The weighted evaluation can be calculated and ranked for all fund managers, regardless of the availability of performance data. Therefore, it is valuable to calculate the optimal weights because it provides a way to rank fund managers without performance data. With these rankings, limited partners can see how new fund managers compare to existing fund managers. If performance data is provided, then it can be used to directly compare fund managers. This multiple criteria decision making model can aid limited partners in deciding fund managers to pass on, fund managers to learn more about, and fund managers to invest with.

7 Conclusion

With backtesting, there is some validation for the following statements using a multiple criteria decision making model:

- Successful Firm Type 1: Large and reputable firm with large number of employees and profit for the period
- Successful Firm Type 2: Very efficient firm with few employees, but high profit for the period as well as high current and solvency ratio
- Low Performing Firm Type 1: Firms with less than 800,000 euros in profit will have lower performance rankings

These statements can be guiding principles for institutional investors seeking a secondaries fund manager. One of the most important factors is efficiency, in terms of profit earned per employee. This is important it does not discriminate by size (measured by profit and number of employees) because both largest companies and smaller companies had high performance.

Efficiency in Fund Managers	Profit per Employee	Grouping
Adams Street Partners (2021)	477,769	High
Hollyport Capital (2021)	368,468	High
Ardian (2021)	142,876	Moderate
Neuberger Berman Private Markets (2018)	128,835	Moderate
Neuberger Berman Private Markets (2021)	122,055	Moderate
Ardian (2018)	86,959	Moderate Low
Intermediate Capital Group (2018)	71,234	Moderate Low
Intermediate Capital Group (2021)	54,233	Low
Landmark Partners (2018)	25,624	Low
LGT Capital Partners (2018)	14,414	Low
StepStone Group (2021)	9,785	Low
LGT Capital Partners (2021)	7,230	Low
Pomona Capital (2018)	1,076	Low
Pomona Capital (2021)	1,030	Low
Landmark Partners (2021)	-80,664	Low

Figure 22. Ranked efficiency by profit per employee

From this efficiency ranking, top performers from 2021 and 2018 data are at the top of the list, including Adams Street Partners, Ardian, and Neuberger Berman Private Markets.

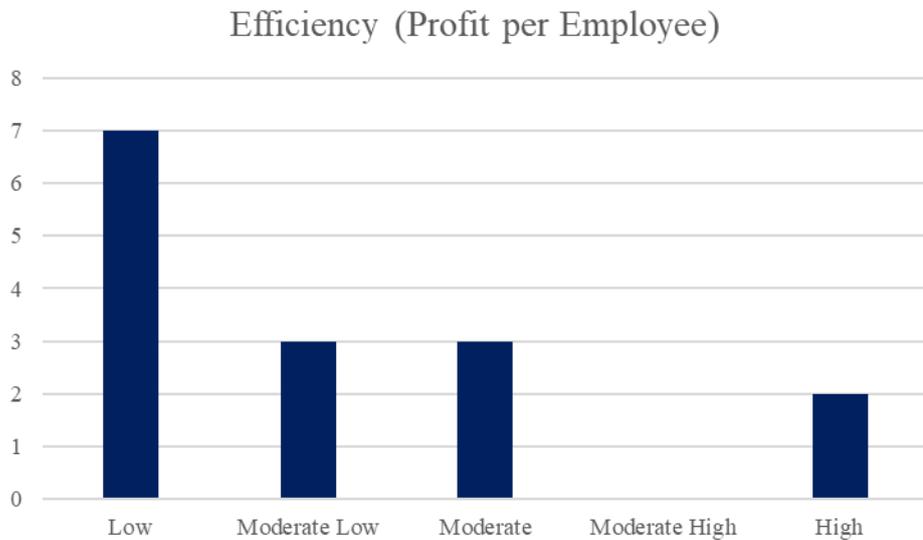


Figure 23. Distribution of fund managers by profit per employee

From Figure 23, you can see that most of the fund managers are on the low end of efficiency, profit per employee. Therefore, in considering which secondary fund manager an institutional investor puts capital with, it is important to consider this measure of efficiency. The efficiency measures support the multiple criteria decision making outcomes as well. In the 2021 data, Adams Street Partners and Ardian were top performers. In 2018 backtesting, Neuberger Berman Private Markets was the top performers. Institutional investors can observe the similarities between these firms and use that to support an investment decision. In this regard, the thesis achieved its objective in aiding the investment decision process for institutional investors.

The limitations for this thesis are data availability and transparency. As discussed earlier, private markets are generally difficult to study because very little information must be publicly disclosed. The details on a deal-by-deal level of secondary transactions are always behind nondisclosure agreements. Once a deal is publicly announced, almost no details are provided, aside from the overall size of the established continuation vehicle. Performance metrics for fund managers are also not disclosed or only reported to existing limited partners. Therefore, my proposals for further research are aimed at investment professionals who have data access. For these investment professionals, I would recommend setting up an Excel spreadsheet with a decision matrix. One decision matrix can consider the deals that the secondaries team receives. An analyst can input each the criteria for each deal and observe groupings of deals. If one deal is more like a deal that typically gets passed, then less time

should be spent on it. If another deal has indicators in common with deals that received an investment recommendation from the secondaries team, then it warrants more consideration. This is one possible implementation of multiple criteria decision making for private markets.

Using multiple criteria decision analysis to aid decision making has four steps: problem structuring, formulation of criteria, evaluation, and supporting implementation (Doupoupos and Zopounidis, 2014, p. 13). In problem structuring, an institutional investor can identify potential fund managers. This can include fund managers with existing relationships and well as new fund managers. In formulating the criteria, the institutional would gather data and determine what criteria is relevant. Some potential criteria, from my experience, are internal rate of return and multiple on invested capital (defined earlier), geographical focus, GP commitment (defined earlier), and any prior relationship. When limited partners invest with new general partners, that is the start of a multi-year relationship worth millions of dollars and a great deal of legal paperwork. Limited partners usually have multiple teams of investment professionals, for primaries, secondaries, credit, and so on. Platform investing is the preference for continuing to work with the same general partners. In my experience, Portfolio Advisors would first invest with the primaries team because they do the most due diligence on the GP's personnel and expertise. Those GPs with relationships always made it pass the initial screening process with the secondaries team. In the decision matrix, platform investing can be represented with a criteria that is zero if there is no existing relationship and one if there is an existing relationship. In the evaluation phase, the decision maker can construct a specific aggregation rule to find all the alternatives with a pre-existing relationship and performance metrics above a certain level. The criteria can also be aggregated in any other way that makes sense to the decision maker. Finally, supporting implementation ends with recommendations after evaluation and implementation based on those choices. Ultimately, human beings are the decision makers. Regardless of what a decision matrix suggests are the best alternatives, it is only one consideration for the decision maker.

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Appendix 1. Decision Matrices

Fund Name	Fund Manager	Target Size (\$bn)	Current Size (\$bn)
ICG Strategic Equity IV	Intermediate Capital Group	5	5.3
ASF VIII Infrastructure	Ardian	4	5.25
NB Secondary Opportunities Fund V	Neuberger Berman Private Markets	3	4.9
Pomona X	Pomona Capital	2	2.6
StepStone VC Secondaries Fund V	StepStone Group	Undisclosed	2.6
Landmark Equity Partners XVII	Landmark Partners	6	2.4
Hollyport Secondary Opportunities VIII	Hollyport Capital	1.5	2
Ardian Secondary Fund IX (ASF IX) Co-Investment	Ardian	Undisclosed	2
Crown Asia-Pacific Private Equity V (CAPE V)	LGT Capital Partners	1	1.65
Adams Street 2022 Global Fund	Adams Street Partners	Undisclosed	1.1

Fund Manager	Profit margin (%)	P/L for period	ROE using P/L before tax (%)
Intermediate Capital Group	9.358	1,138,885	42.055
Ardian	15.825	54,578,799	96.156
Neuberger Berman Private Markets	13.964	25,753,596	40.237
Pomona Capital	2.163	37,085	14.415
StepStone Group	2.166	655,577	4.653
Landmark Partners	-19.94	(12,986,828)	n.a.
Hollyport Capital	59.973	15,475,671	n.a.
Ardian	15.825	54,578,799	96.156
LGT Capital Partners	1.392	151,823	3.692
Adams Street Partners	59.433	7,166,537	492.822

Fund Manager	Current ratio	Solvency ratio (Asset based)	Number of employees
Intermediate Capital Group	1.22x	21.96%	21
Ardian	1.62x	36.28%	382
Neuberger Berman Private Markets	1.83x	48.96%	211
Pomona Capital	1.17x	35.63%	11,259
StepStone Group	2.69x	64.72%	67
Landmark Partners	0.52x	-47.06%	161
Hollyport Capital	1.14x	12.39%	n.a.
Ardian	1.62x	36.28%	382
LGT Capital Partners	1.49x	20.33%	21
Adams Street Partners	1.93x	49.50%	15

Table 3. Decision matrix for 2021 (*Secondaries Investor* and *Amadeus* database)

Fund Manager- 2018	P/L for period	Current ratio	Solvency ratio (Asset based)
Intermediate Capital Group	854,812	3.43x	72.1%
Ardian	22,870,174	1.9x	41.4%
Neuberger Berman Private Markets	28,987,847	1.82x	45.9%
Pomona Capital	41,956	1.12x	35.0%
StepStone Group	975,822	1.69x	0.0%
Landmark Partners	5,560,513	.97x	12.7%
Hollyport Capital			
LGT Capital Partners	187,383	1.47x	31.5%
Adams Street Partners	1,405,928	2.69x	0.0%

Fund Manager- 2018	Number of employees	Profit margin	ROE using P/L before tax
Intermediate Capital Group	12	10.5%	37.2%
Ardian	263	9.9%	42.5%
Neuberger Berman Private Markets	225	13.0%	58.2%
Pomona Capital	39	2.0%	17.2%
StepStone Group	45	6.0%	n.a.
Landmark Partners	217	6.7%	58.6%
Hollyport Capital			
LGT Capital Partners	13	2.8%	7.0%
Adams Street Partners	13	13.1%	n.a.

Table 4. Decision matrix for 2018 (*Secondaries Investor* and *Amadeus* database)

Appendix 2. Glossary

Amadeus database- A database of financial information for private and public companies across Europe. LUT maintains access to this database for its students.

Closed ended fund- A closed ended fund has distinct phases and a predefined time horizon, usually ten to twelve years. First, the closed ended fund is fundraising, where the fund accepts commitments from limited partners. Then, it moves to the investment phase, where the general partner or investment team decides what companies to invest with. At the end of the life of the fund, the general partners exit the positions and distribute the returns to the limited partners. (Chen, 2022)

Continuation Vehicle- Abbreviated as CV. A special purpose fund that is set up near the end of the life of a closed ended private fund. If a general partner wants to maintain exposure to a company or several companies, the general partner can create a continuation fund. Existing limited partners have the option of receiving distributions or rolling over the position into the continuation vehicle. The continuation vehicle can also raise new capital from new limited partners. (Woodman, 2021)

Fund Manager- A fund manager can refer to the general partner as the organization that manages the investment decisions and daily maintenance of private funds. A fund manager can also refer to the person or team that is responsible for investment decisions. (Chen, 2021)

General Partner- Abbreviated as GP (as in GP-led secondary). General partners are investment professionals who work at a private equity firm. The private equity firm raises funds, which collect capital from investors. General partners have the technical knowledge and responsibility for decision making, including what companies to invest in, how much capital to invest, and daily maintenance of the fund. (Vaidya, 2023)

GP-led Secondary- From my experience, a GP-led secondary is initiated by the general partner. The general partner identifies asset or assets that he or she wants to maintain exposure to. The general partner informs all existing limited partners, who have the choice to take a distribution or roll the money into a continuation vehicle. The general partner works with an investment bank to sell the transaction to new limited partners and establish the continuation fund.

Institutional Investor- An institutional investor is a company or organization that invests money on behalf of clients or members. Common examples of institutional investors are pension funds, endowments, or ultra-high net worth individuals or families. Institutional investors have more sophistication, or technical knowledge, than the average investor and are subject to less restrictive regulations. (Chen, 2021)

Limited Partner- Abbreviated as LP (as in LP-led secondary). Limited partners are sophisticated investors who invest the capital into a private equity fund. They have no impact of the investments of the fund and must send money when it is called by the general partners. (Vaidya, 2023)

LP-led Secondary- From my experience, a LP-led secondary is initiated by a limited partner. A limited partner seeking liquidity would propose a sale of the commitment to the private fund to a secondary buyer. In exchange for payment, the buyer would receive the existing position in the fund. The original limited partner always sells the position for a discount. The general partner has no role in this transaction.

Secondaries Investor- Can be abbreviated as *SI*. *Secondaries Investor* is the premier resource for industry professions who work with secondary transactions on a regular basis, from my experience on a secondaries team. *Secondaries Investor* tracks funds, institutions, deals, and other news that shapes the secondary market within private equity, real estate, infrastructure, and private debt. It also holds a database of limited partners, general partners, funds, and completed deals. It is the primary resource for data in this thesis.

Secondary transaction- The secondary market facilitates secondary transactions that allows investors to exit a closed ended fund early, liquidate assets, or rebalance portfolios. They also allow incoming investors to buy private assets in the middle of the performance cycle and, usually, at a discounted price. In general, secondary transactions allow flexibility that may become necessary in an otherwise illiquid market. (Kupec and Feder, 2021)