



Exploring High Net Worth Individuals Influencing on Return of Private Equity Funds

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Abstract. This paper systematically studies the influence of high net worth individuals(HNWI) on the return of private equity investment in China, based on the three-factor model of fund size, fund staging and fund type of Professor Kaplan in MIT.,this paper makes modification and improvement, and constructs a seven-factor model based on the variables of investor structure(high net worth individuals), size, industry, region, investment period, exit method and fund type. It is found that investment returns are better when the proportion of high net worth individuals in the investor mix is higher than 50%. When investors are mainly high net worth individuals, GPs should fully understand the characteristics of such high net worth individuals, such as whether they belong to the senior management of the enterprise or the first generation of wealth creation entrepreneurs, and provide different PE products according to the characteristics of different high net worth individuals;

Keywords: high net worth individuals(HNWI); private equity funds; investment returns

1 Introduction

Private equity funds (PE) first originated in the 19th century in the U.S. Claudia Zeisberger, Michael Pahl, Bowen White (2018) state that a private equity fund is an independent investment vehicle managed by a PE firm on behalf of a group of investors. It usually includes four stages: fundraising, investment, post-investment management and exit, and when raising capital, it is usually clearly stated that the fund invests only in equity in unlisted companies and exits after a certain period of time to obtain investment returns. As an innovative financial instrument, private equity funds have gained rapid development worldwide in recent years and have become the third largest financing channel in the capital market, after bank loans and public offerings (IPOs).

The concept of private equity investment fund is explained in "Equity Investment Funds" published by the China Securities Investment Fund Association in September 2017. Private equity funds, i.e. private equity funds, refer to investment funds that raise funds in a non-public manner and invest mainly in "private equity". The term

"private equity" refers to non-publicly issued and traded equity, including non-publicly issued and traded common stock, preferred stock convertible into common stock and convertible bonds of unlisted companies and listed companies. A M&A fund is a type of private equity fund that focuses on equity acquisitions and seeks a bargain exit after the consolidation of resources.

Professor Claudia (2018) of the Global Private Equity Investment Research Group (GPEI) at INSEAD adopts a broad definition of private equity funds-i.e., to include venture capital, growth equity, and M&A funds.

To sum up, private equity fund as a financial innovation tool, broad PE includes VC. because the overall development of PE in China is in its infancy, both academic and practical circles, the distinction between growth equity investment and M&A fund is rather vague, usually M&A fund is classified as equity investment fund. In contrast, venture capital belongs to venture capital focuses on investing in the equity of start-up enterprises, and the difference between the two is more obvious. Based on this, this paper adopts a broad definition of private equity funds in consideration of the main purpose of this study, i.e., private equity funds refer to investment funds that raise funds in a non-public manner and invest mainly in "private equity", mainly distinguished as equity investment funds (PE), including growth equity and M&A funds. The main distinction is between equity investment funds (PE), including growth equity and M&A funds, and venture capital funds (VC).

2 Theoretical basis and Model Construction

2.1 Theoretical Basis

The Efficient Markets Hypothesis (EMH) was first developed in 1970 by Eugene Fama (Nobel Prize 2013). Eugene Fama (2013 Nobel Prize in Economics) deepened and proposed it.

Since its introduction, the efficient market hypothesis has been promoted by mainstream economists, but there are many opponents, including Robert. Shiller (behavioral economics), and Thaler (behavioral finance), who won the Nobel Prize in economics in 2017. The efficient market hypothesis has become the dominant theory in the empirical study of securities markets, and although there is some controversy, it is undeniable that it still occupies an important place in the basic framework of the mainstream theory of modern financial markets.

Professor Schoar of MIT Sloan School and Professor Kaplan of University of Chicago constructed a three-factor model in the field of private equity funds, based on Farmer's suggestion([1] Eugene F. Fama. 2017), to investigate the impact and relationship between investment returns in terms of size, staging and fund type.

2.2 Model Construction

In this paper, we refer to Professor Kaplan's quantitative model and improve and refine it by adding variables such as investor structure, industry, geography, investment

duration and exit method to study the impact on fund returns([2] Steven N. Kaplan and Antoinette Schoar., 2005).

The quantitative model proposed by MIT professor Kaplansee (below figure 1), based on the proposal of Nobel economist Eugene Fama (efficient market theory), has the following variables: fund size, fund sequence and fund characteristic. The quantitative model proposed by Kaplan, based on the recommendations of Nobel laureate Eugene Fama (efficient market theory), uses fund size, fund sequence, and fund characteristic as variables as follows:

$$PME_i = \alpha_i + \beta(FundSize_i) + \lambda(Sequence_i) + \gamma_{VC} + \varepsilon_i$$

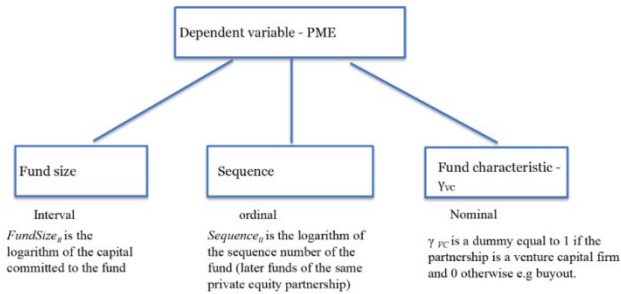


Fig. 1. MIT Professor Kaplan's Quantitative Trivariate Model

Explanation of PME-public market equivalent:

PME facilitates investors to compare the performance of equity funds with public market investments.

2.2.1 Rationale for Model Improvement.

This paper addresses improvements to MIT Professor Kaplan's quantitative model and the rationale for:

(1) The dependent variable uses IRR instead of PME

Explanation of Internal Rate of Return (IRR):

Internal Rate of Return (IRR) refers to the discount rate when the total present value of capital inflows is equal to the total present value of capital outflows and the net present value is equal to zero. IRR is a common indicator for measuring investment returns in the domestic private equity industry.

The dependent variable is IRR instead of PME. Investment returns in mature foreign PE markets include three aspects: institutional returns, fund returns and project returns. With the realized value and unrealized valuation of the investee company, project returns can be calculated. The commonly used direct performance indicators are book return multiple (multiple money invested ,Mom) and book internal rate of return (IRR). In addition, foreign scholars also use indirect measures such as public market equivalent (PME), which allows comparing investments in PE funds with equivalent investments in public market benchmarks (e.g. S&P 500). In the domestic PE practice, PME index is hardly used for two reasons: on the one hand, the domestic stock market is a public market with daily trading, active trading and volatile market

index, but unlike foreign stock markets (e.g., the U.S.), it is not fully market-oriented and is heavily influenced by policies, and the market index often does not reflect economic fundamentals at the same time, and sometimes there is a policy market that is detached from economic fundamentals. On the other hand, the domestic equity PE market is a non-public private market, with a fund term of 5-10 years, a trading term of 3-6 months, relatively inactive transactions, and relatively small fluctuations in fund returns, which is more in line with economic fundamentals; the domestic stock market and the domestic equity PE market are two completely different markets, so the comparison between the domestic stock market index and the domestic PE returns is not very valuable. Therefore, the comparison between domestic stock market index and domestic PE returns is not very valuable. At the same time, considering the current situation of PE development in China and data availability, the PE returns in this paper are selected as project returns, mainly using the direct performance (IRR, i.e. book internal rate of return) of PE management organizations when exiting a certain portfolio company for research.

(2) Delete the variable fund phasing

Removing the variable fund staging, the development of funds in the United States has a history of nearly 100 years, and funds have a long duration, so staging is more applicable. However, the development of the domestic fund registration system began in 2012, and funds usually have an investment cycle of 5-10 years, so most funds are still in the first or second phase, so the second indicator of Professor Kaplan's model, "fund staging", is not applicable in China.

(3) Addition of variables investor structure, geography, industry, duration and exit method ([3] Yang Yi. 2022)

(a) According to the classification of indicators of private equity funds database by domestic authority, WANDER Information Technology Co., Ltd. classifies the indicators of private equity funds into fund size, geography, industry, duration, exit method and fund type;

According to the relevant research results in China and abroad, there are different studies on investor structure, fund size, geography, industry, duration, exit method and fund type.([4]Wang M. 2022)

According to a field study of 120 financial planners, most of them are more concerned about the impact of investor mix, fund size, geography, industry, duration, exit method and fund type on investment returns.

In summary, this paper adds investor structure, industry, geography, investment duration, and exit method as variables.([5] Huang Xiaojie, Zhao Zhongyi. 2008)

2.2.2 Model Construction and Variable Definition.

In this paper, we refer to Professor Kaplan's quantitative model and improve and refine it by adding variables such as investor structure, industry, geography, investment duration and exit method to construct the model as follows (see figure 2).

$$IRR_{it} = \alpha_i + \beta(\text{Investor structure}_{it}) + \lambda_1(\text{FundSize}_{it}) + \lambda_2(\text{Industry}_{it}) + \lambda_3(\text{Region}_{it}) + \lambda_4(\text{Term}_{it}) + \lambda_5(\text{Exit}_{it}) + \gamma_{VC} + \varepsilon_{it}$$

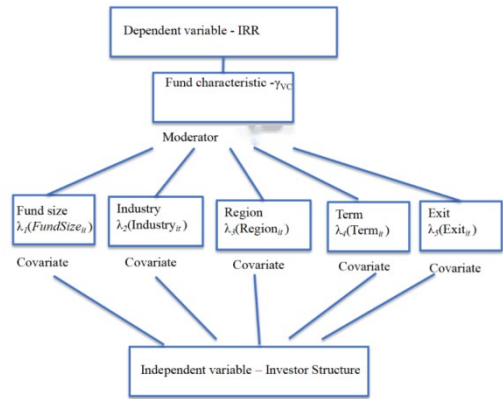


Fig. 2. Quantitative model of seven variables constructed in this paper

Define the relevant variables as follows(see table 1):

Table 1. Variable definition and determination method

Variables	Definition
Dependent variable	Internal Rate of Return $IRR=(1+BR)^{(1/t)}-1$, where t is the annual-ized investment period (years) and represents the return on invest-ment;
Independent varia-ble	Independent variable β (Investor structure _{it}) is the investor structure. if investors contain more than 50% of high net worth people, then the value is 1, otherwise the value is 0;
Control variables	The control variable $1\lambda_1$ (Size _{it}) is the fund size in million dollars;
	The control variable $2\lambda_2$ (Industry _{it}) is the industry selected. if it is a high-tech industry conforming to the direction of STAR Market, then the value is 1, otherwise the value is 0;
	The control variable $3\lambda_3$ (Region _{it}) is the geographic region, if the manager and the investee firm in the same territory (province), then takes the value of 1, otherwise takes the value of 0;
	Control variable $4\lambda_4$ (Term _{it}) is the investment horizon in years;
	control variable $5\lambda_5$ (Exit _{it}) is the exit method, which takes the value 1 if the exit method is IPO, otherwise it takes the value 0;
Intermediate varia-bles	γ_{VC} is the fund type and takes the value of 1 if the fund type is VC, otherwise it takes the value of 0;
Other Variables	ε_{it} is an unobservable other factor that may affect the return on PE investment

3 Empirical Study and Conclusions

In order to improve the reliability and accuracy of the sample, this paper focuses on selecting the sample with public information on exit returns, and based on the database of the domestic authority WAND Information Technology Co., Ltd. the PE private equity exit cases between January 1, 2016 and October 15, 2019 in the database of WAND Information Technology Co. Ltd. are selected as the basis, and a total of 1,222 PE private equity exits with exit investment returns are selected of valid data as the model sample.

3.1 Model Application

In this paper, the full sample is analyzed by sub-year, investor structure, size, industry, geography, duration, exit method and fund type, statistical, binary regression, t-test validation, and empirical study of the following models.

$$IRR_{it} = \alpha_{it} + \beta(Investor\ Structure_{it}) + \lambda_1(Size_{it}) + \lambda_2(Industry_{it}) + \lambda_3(Region_{it}) + \lambda_4(Term_{it}) + \lambda_5(Exit_{it}) + \gamma_{vc} + \varepsilon_{it}$$

The assumptions are as follows:

- (1) Hypothesis 1: Investment returns are better when the proportion of high net worth clients in the investor mix is higher than 50%
- (2) Hypothesis 2: Within a certain range, the larger the investment size, the better the investment return
- (3) Hypothesis 3: High-tech industries have a more significant impact on investment returns relative to other industries ([6] Wei Wenji, 2021)
- (4) Hypothesis 4: PE managers and PE projects in the same geographic area have better fund investment returns ([7] Zang Yanqiu, Wang Shichun, Zhang Min, Zhang Wentao. 2023)
- (5) Hypothesis 5: The shorter the investment period, the better the investment return
- (6) Hypothesis 6: The positive impact of IPO exit relative to equity transfer on investment returns is more significant
- (7) Hypothesis 7: There is no significant difference in the effect of fund type as PE or VC on investment returns

3.2 Empirical Analysis

We selected some data on exited private equity funds from January 2016 to October 2019 from the database of Wanderer Information Technology Co. for statistical analysis. The total sample is 1,359 entries. About 10% of outliers with very high IRR were excluded, leaving a valid sample of 1,222 entries (see table 2).

Table 2. Descriptive statistics

	N	Minimal value	Maximum value	Average value	Standard deviation	Variance
X1 (geographical area)	1222	.00	1.00	.2136	.41000	.168
X2(Industry)	1222	.00	1.00	.5041	.50019	.250
X3 (Fund Type)	1222	.00	1.00	.4362	.49611	.246
X4 (investor structure)	1222	.00	1.00	.3969	.48945	.240
X5 (exit method)	1222	.00	1.00	.6637	.47265	.223
X6 (scale)	1222	28.29	296910.00	8466.0895	24081.90613	5.799E8
X7 (Duration)	1222	.00	11.70	3.4555	2.02798	4.113
Y (IRR)	1222	-1.0000	1.2298	.238977	.3108825	.097
Valid N (list status)	1222					

The main independent, control and mediating variables are:

(1) whether the private equity fund manager and the subject company belong to the same province; if the same province is "1", the different identity is "0"; the variable is indicated by "X1";

(2) whether the subject company is in the industry to which the KCI belongs; if yes, it is "1"; if not, it is "0"; the variable is denoted by "X2";

(3) whether the private fund manager is a VC; if yes, it is "1"; if not, it is "0"; the variable is indicated by "X3";

(4) whether the direct shareholders of the private equity fund account for more than 50% of individual investors; if yes, it is "1"; if not, it is "0"; the variable is denoted by "X4";

(5) whether the subject company exits through IPO; if yes, it is "1"; if not, it is "0"; the variable is denoted by "X5";

(6) The amount of investment, in million dollars; the variable is denoted by "X6";

(7) Investment life, in years; the variable is denoted by "X7";

The dependent variable is IRR. The percentage of fund managers with VC attributes is 43.62%; the percentage of funds with direct shareholders of private equity funds with individual investors exceeding 50% is 39.69%; the percentage of subject companies exiting through IPO is 66.37%; the average investment amount of private equity funds is 84.66 million RMB; the average investment period is 3.45 years;

The mean value of IRR for all samples is 23.89%; the maximum value is 122.98%; and the minimum value is -100% (all principal invested is lost).

The standard deviation of IRR is 31.1%, with a maximum value of 122.98% and a minimum value of -100% (total loss of principal).

Based on the results of the above empirical study and regression analysis, the overall significance level of the model is 0.000. the model is highly significant at the 99% level.

From the above analysis, we can find that the mean value of IRR of all samples is 23.89%; the maximum value is 122.98%; the minimum value is -100% (all investment principal is lost). the standard deviation of IRR is 31.1%, its maximum value is 122.98%, and the minimum value is -100% (all principal is lost), which indicates that the difference of investment returns among domestic PE institutions or projects. It also confirms from the empirical perspective that the level of domestic PE institutions is mixed and professional institutions still need to be developed.

3.3 Conclusion and Insights

3.3.1 Conclusion.

The study found that investment returns are better when the proportion of high net worth clients in the investor mix is higher than 50%,

From the above study, it can be found that high net worth individual investors have some impact on investment returns. From the analysis of investor structure, it can be seen that the sample of direct shareholders of private equity funds with more than 50% individual investment is 485, with a mean IRR value of 26.26%; the sample of direct shareholders of private equity funds with less than 50% individual investment is 737, with a mean IRR value of 22.34%; intuitively, the sample of direct shareholders of private equity funds with a higher percentage of individual investment has a higher IRR level than funds with less than 50% of individual investors. However, the t-test reveals that the impact of the proportion of individual investors on IRR is small and not monotonic.

From this, hypothesis 1 (investment returns are better when the proportion of high net worth clients in the investor mix is higher than 50%.) can be found. holds, but is not significant.

3.3.2 Insights.

In recent years, accompany with domestic economy developing, population with HNWI continues to grow, and high net worth individual has become an important part of PE's investors. Especially when investors are mainly high net worth individuals, GPs should fully understand the characteristics of such high net worth individuals, such as whether they belong to the senior management of the enterprise or the first generation of wealth creation entrepreneurs, and provide different PE products according to the characteristics of different high net worth individuals; For example, for the first generation of wealth creation entrepreneurs, most of them are close to or over 60 years old, generally conservative, and have a better understanding of traditional industries such as manufacturing. Therefore, they can recommend more equity projects for industrial upgrading, which is safer and more stable. If the senior management of the new economy enterprises they are facing are familiar with the new economy, high technology and other new economy fields and are more likely to be interested in, they can recommend more high-quality projects in high-tech fields that meet the requirements of the IPO exit of STAR Market.

Finally, GPs of private equity investment funds should learn from Schiller's feedback loop theory, and when introducing private equity investment fund projects, they should not only focus on introducing the excellent historical performance of GPs of private equity investment funds, but also form positive feedback and finally promote investors' investment. At the same time, GPs should avoid the Ponzi scheme.

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