An empirical research on the Non-Linear effect of financial asset allocation on the development of main business

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Abstract. With respect to the hot issue of "breaking away from entity economy, and transforming to virtual economy" in Chinese economy over the years, an empirical test is carried out in the paper considering the influence of financial asset allocation on the development of main business in entity enterprises by regarding A-share entity enterprises in Henan Province from 2009 to 2018 as the research samples. According to the research, entity enterprises in Henan Province are of huge differences in financial asset allocation and in general, the configuration level is not high, and the main business is facing lower operating incomes. From the perspective of different industries, financial asset allocation of enterprises in the manufacturing industry presents U-shaped relations with the development of main business, and when the level of financial asset allocation in enterprises reaches to 10.47%, incomes obtained by financial asset allocation can promote the development of main business, but the above effect isn't obvious in other industries. The research conclusion made in the paper is that entity enterprises can benefit more by making reasonable investment decisions, improving the utilization rate of idle funds, perfecting the effectiveness of financial market, and depositing into financial institutions, and these effects can provide the major basis to realize "the mutual promotion of finance and industry".

1. Introduction
As Chinese economy is entering the phase of structural transformation, entity economy is facing a dilemma of decline in operating profits given the excessive production capacity of traditional industry, the decline in export demand, the sharp increase in cost, the insufficiency in effective market demands and other unfavorable conditions [1-2]. However, as the financial industry has been constantly perfected and developed along with the constant innovation of financial products with higher investment rates of return over the years, more and more enterprises start to invest their funds in financial assets. Scholars have paid attention to the influence of financial asset allocation on the development of main business in enterprises. For example: By adopting multiple linear regression, Yong DU[3] concluded that the financial asset allocation in enterprises can restrain the development of main business; Ming XIAO and Chao CUI[4] adopted multiple regression and included the quadratic term for the level of financial asset allocation. They held that the level of financial asset allocation had inverted U-shaped relations with the corporate performance in listed non-financial companies; Zhiyong XU and Pan PAN[5] adopted threshold model, and held that, non-financial enterprises can present obvious "U-shaped" non-linear interval effect due to the difference between financialization and operating performance in non-financial enterprises. In respect of researches about
the effect of financial asset allocation on the development of main business in enterprises, there haven't been any unified research conclusions, which may be caused by the failure to focus on the influence of regional economic development and industrial differences on the research result.

Different industries are of huge differences in the level of competition, political support, industrial risks, investment incomes, etc. Therefore, with the increasingly shown trend of financial asset investment in entity enterprises, it's essential to consider the effect of financial asset allocation on the development of main business in enterprises given the regional and industrial differences, to lead entity enterprises to invest and make decisions reasonably, receive better financial services, and prevent from systematic financial risks.

2. Analysis on the influencing mechanism of financial asset allocation on the development of main business in entity enterprises

From the perspective of easing corporate financing constraints, enterprises can benefit by selling or pledging financial assets, and from financial channels brought by allocating financial assets (such as investment incomes, and interest incomes), and obtain financial assets by building bank-enterprise relations, and widening credit constraints, etc., to ease the practical capital investment and the financial constraints of R&D input in enterprises, and promote the development of main business, which can be manifested as "reservoir effect"[6].

From the perspective of arbitrage motivation, financial asset allocation is a major investment decision made by senior management personnel in enterprises, so the influence of agency problems is inevitable. Compared with financial assets, physical investment and R&D input in enterprises have the characteristics of long investment periods, big demand amount, high asset management costs and investment risks, so senior management personnel are taking huge risks. However, listed companies "value more on awards and less on punishment"[7], in respect of the loss and profits of financial assets, to promote senior management personnel to invest more funds in financial assets. As a result, managers are thinking about maximizing personal interests, and will cut down the input in R&D innovation, and long-term operational activities, to acquire the highest incomes of financial assets, so the development of main business will be restricted, and shown as the "crowding-out effect".

To sum up, the influence of financial asset allocation on the development of main business in enterprises can be mainly summarized into two categories. The first category is "reservoir effect", which is shown as easing certain financial constraints on the main business with financial assets, and then promoting the development of main business in enterprises; The other category is the "crowding-out effect", which is shown as decreasing assets in equipment upgrading and R&D innovation, and then constraining the development of main business in enterprises, when more funds are invested in financial assets [3].

This paper has made the following hypotheses on this basis:

H: Financial asset allocation and the development of main business are of non-linear effect in entity enterprises.

3. Research design

3.1. Sample selection and data source

A-share listed companies in Henan Province in 2009-2018 are selected as the initial samples in the paper. After removing ST and ST* company based on the initial samples along with listed companies in financial and real estate industries as well as samples with missing data, the final score belongs to 584 annual observation values in 14 industries. Implement Winsorize processing on continuous variables as per 1% at the left and right sides, to eliminate the influence of abnormal values. All data are from CSMAR database.

3.2. Definition of key variables
Level of financial asset allocation (Fin) index. Financial asset holding rate is used in the paper, to measure the investment behavior of enterprises in financial asset allocation. By referring to the approaches adopted by Yong DU et al.[3], the calculation formula for the level of financial asset allocation is as follows: trading financial assets+ derivative financial assets + issued loans and net advanced assets + net financial assets available for sales+ held-to-maturity net investment +net amount of investment-oriented real estate)/total assets.

Corporate CorePerf index. By referring to the method of Conghui HU et al.[8], this paper measures the development of main business in enterprises with the operating asset rate of return deducted by incomes in financial investment, and the calculation forum is as follows: (total profits-investment incomes-variable incomes of fair value+ investment incomes of joint ventures and associated enterprises)/total assets.

Other control variables. Refer to Table 1 for the definition of other control variables.

Table 1. Definition table of control variables.

| Variables | Calculation |
|-----------|-------------|
| Lev       | Total liabilities scaled by total assets |
| Size      | Natural log of total assets |
| Growth    | The rate of increase of the sales income |
| Shrz      | The proportion of equity shares owned by the largest shareholder |
| Idpdt     | The proportion of independent directors on the board |
| Soe       | An indicator variable that equals to 1 if it’s state-owned enterprise, 0 otherwise |
| BS        | Number of directors on the board |
| SS        | Number of supervisors |
| ceo_2     | An indicator variable that equals to 1 if a CEO serves as the chair of the board |
| Year      | Annual dummy variable |

3.3. Model design
By referring to the research design of Yong DU (2017)[3] et al., the following models are used to test the research hypothesis proposed in the paper:

\[ CorePerf = \beta_0 + \beta_1 Fin_{it} + \beta_2 Fin_{it}^* + \beta_3 \sum Controls_{it} + \epsilon_{it} \]  \hspace{1cm} (1)

4. Empirical process and result analysis

4.1. Descriptive statistics and correlation analysis of main variables

Table 2. Descriptive statistical analysis and correlation analysis table.

| Variables | Sample size | Average | Standard deviation | Median | The Minimum value | The Maximum value | Pearson correlation coefficient of main variables |
|-----------|-------------|---------|-------------------|--------|------------------|------------------|-----------------------------------------------|
| Fin       | 584         | 1.76%   | 3.60%             | 0.20%  | 0.00%            | 22.80%           | Fin                                           |
| CorePerf  | 584         | 3.12%   | 6.68%             | 2.80%  | -17.30%          | 26.60%           | CorePerf                                      |

Table 2 has reported the descriptive statistical result of major variables As can be seen from the level of financial asset allocation (Fin) measured from the perspective of investment, the level of financial asset allocation for A-share entity enterprises in Henan Province is mainly centered on few enterprises, with bigger differences in the configuration level. As can be seen from the operating performance (corepf) of main business, the level of performance incomes for the main business of entity enterprises in Henan Province is relatively low, and the level of performance incomes for main business among 50% samples is lower than the structural deposit incomes of banks. The income level
of 75% samples is lower than 6%. As can be seen from the matrix of correlation coefficient for main variables, there is no obvious collinearity among main variables.

4.2. Multiple regression analysis

Table 3. Regression result of all samples.

| Variables | (1) | T-value |
|-----------|-----|---------|
| CorePerf  | -0.106 | (-0.81) |
| Fin*Fin   | 0.496 | (0.78)  |
| Control   | control | control |
| _cons     | -0.422*** | (-8.05) |
| Ind       | No |
| N         | 584 |
| ll        | 930.20 |
| chi2      | 368.61 |

Notes: *** p<0.01, ** p<0.05, * p<0.1

As can be seen from results of regression of Table 3, there is no obvious statistical correlation between the allocation of financial assets and the development of main business in entity enterprises among all samples, so the hypothesis has not been confirmed. The possible reason is that financial asset allocation in entity enterprises covering different industries in Henan Province is unevenly distributed and may cause confusions to the regression result of all samples. Therefore, further testing is still required in different industries.

4.3. Further research

Table 4. Regression result of different industries.

| Variables | Manufacturing industry | Mining industry | Service industry | Agriculture, Forestry, Animal husbandry and Fishing industries |
|-----------|-----------------------|-----------------|------------------|---------------------------------------------------------------|
| CorePerf  | (1)                   | (2)             | (3)              | (4)                                                           |
| Fin(b)    | -0.300**              | 2.028           | 0.555            | -0.106                                                        |
|           | (-2.00)               | (1.13)          | (1.23)           | (-0.81)                                                       |
| Fin*Fin(a)| 1.423***              | -21.839         | -4.784           | 0.496                                                         |
|           | (2.00)                | (-0.79)         | (-1.08)          | (0.78)                                                        |
| Control   | control               | control         | control          | control                                                       |
| _cons     | -0.468***             | -1.648***       | -0.168*          | -0.422***                                                     |
|           | (-6.68)               | (-3.85)         | (-1.71)          | (-8.05)                                                       |
| N         | 469                   | 52              | 41               | 584                                                           |
| ll        | 755.27                | 90.61           | 96.32            | 930.20                                                        |
| chi2      | 366.70                | 41.90           | 232.48           | 368.61                                                        |

Notes: Output t value or z value in the bracket; *** p<0.01, ** p<0.05, * p<0.1

Table 4 reports the influence of financial asset allocation on the development of main business in entity enterprises covering different industries in Henan Province. As can be seen from the regression result, when the primary regression coefficient is at the level of 5%, the financial asset allocation in enterprises of the manufacturing industry is of obviously negative correlation with the development of main business, but when the quadratic term of the financial asset allocation is at the level of 5%, they are of obviously positive correlation. This indicates that there is an inflection point between financial asset allocation and the development of main business in the manufacturing industry of Henan Province, and is shown as U-shaped relations, and reflected as restricting at first, and promoting later. The result is consistent with the research result of Zhiyong XU and Pan PAN [5].
Calculate the inflection point based on the two coefficients, and the value is 10.47% when the annual effect is under control. This indicates that, in the manufacturing industry, when the ratio of financial asset allocation in total assets is lower than 10.47% in enterprises, the development of the enterprise will be restricted; but when the ratio exceeds 10.47%, the development of main business will be promoted. Possible reasons include: The current problems faced by entity enterprises in development are financing difficulties and expensive financing, and due to the uncertain macroeconomic environment, the business difficulties are intensified for entity enterprises; Besides, since our financial market is still in constant perfection, it's generally difficult to use financial assets to ease financing constraints on enterprises, but in respect of higher level of financial asset allocation, enterprises can configure different types of financial assets to disperse investment risks, and then bring financial incomes to promote the development of main business in enterprises. It also further shows that, entity enterprises can use idle funds to configure financial assets only when the financial market is sufficiently developed, and this approach can not only promote the use efficiency of funds, but also the development of main business based on incomes of financial assets.

5. Research conclusions and implications
The paper takes A-share entity enterprises in Henan Province as research samples, to investigate the influence of financial asset allocation on the development of main business in entity enterprises. As can be seen from the empirical test of different industries, the level of financial asset allocation in enterprises of the manufacturing industry is of U-shaped relations with the development of main business. When the level of financial asset allocation in enterprises is lower than 10.47%, the financial asset allocation is to the disadvantage of the development of main business in enterprises; When the level of financial asset allocation in enterprises is higher than 10.47%, the financial asset allocation is in favor of the development of main business in enterprises.

The paper puts forward the following suggestions based on the above conclusion: Reasonable decisions on the investment of financial assets. On one hand, entity enterprises in Henan Province have a lower level of financial asset allocation; On the other hand, entity enterprises have a lower constraint level in financing. Enterprises can make reasonable use of credit level, and invest in financial assets appropriately, and promote the development of main business with financial incomes.

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