NBER

Household Finance Research Grant Application

Title:

Micro Evidences of Skewness Preference

Author:

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Institution:

HEC Paris

Swedish House of Finance

Application Date:

20/03/2017

Proposal

Micro Evidences of Skewness Preference

ZHANG Yapei*

March 20, 2017

1 Overview and Objectives

This project uses a unique Swedish dataset on household portfolio choice to provide micro-level evidences of individual skewness seeking behavior and to nvestigate the relationship between preferences on different moments and the relationship between skewness seeking and household characteristics. I will seriously treat asymmetry preference on different levels and implications from different theories. Hopefully, evidences provided by this work will provide a hint of which framework fits better the reality, and shed lights on new theoretical developments.

Skewness of return distribution and skewness preference are natural extensions to enrich the classic mean variance world. Asset returns are known to exhibit asymmetric distributions and suffer from jumps. Thus, return distributions cannot adequately be characterized only by means and variances. Out of mean variance world, skewness preference is one of the important elements in portfolio optimization and asset pricing. This project is the first that uses high quality individual financial holdings data to investigate skewness preference among investors. Preference for positive skewness in different frameworks has been intensively studied, including expected utility, prospect theory, disappointment aversion utility, optimal believe utility, etc. Alhough there is a large literature on optimal asset allocation choices under asymmetric return distribution and asset pricing implications of asymmetry preference over the past decades, it is difficult to put them in perspective to each other, as they focus on similar, although different aspects: such as asset level vs. portfolio level, distribution shape vs. rare event. We will seriously treat asymmetry preference on different levels and implications from different theories. By looking at the relationship between preferences on different moments and wealth effect on third moment preference, we will be able to distinguish different frameworks. Theoretical work on this topic has little empirical evidence as guidance. On one hand, many empirical works do not put enough effort to distinguish different measurements of skewness and different preference theories; on the other hand, there is a shortage of accurate micro level data on individual portfolio choice. This project uses a unique Swedish dataset on household portfolio choice to provide micro-level evidences of individual skewness seeking behavior. Hopefully, evidences provided by this work will give a hint of which framework fits better the reality and motivate more theoretical works.

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2 Research Questions

The objective of this project is to answer the following important questions:

1. Do investors achieve higher skewness than the market?
2. How does household achieve high skewness? Through systematic skewness or idiosyncratic skewness? What are the sources of different components of portfolio skewness?
3. Is the link between skewness preference and risk aversion given by expected utility consistent with reality? If not, what other factors can drive this relationship?
4. How does skewness taking behavior relate to household characteristics? Does wealth, background risk or labor income risk plays an important role in investor's skewness seeking behavior?

3 Data

The empirical analysis will be based on the Swedish Wealth and Income Registry, a high-quality administrative panel of Swedish households. Information available on each resident can be grouped into three main categories: demographic characteristics, incomes, and disaggregated wealth. In the disaggregated wealth, we observe the worldwide assets owned by each resident on Dec 31 of each year from 1999 to 2007, including bank account, mutual funds, and stocks. Together with equity return data, we can compute portfolio skewness of investor at annual frequency. Detailed demographic characteristics and income data allow studying the interaction between skewness seeking and other potential factors.

4 Research Design

In the first part of the project, We will simply look at different behavors of asset skewness, portfolio skewness and market skewness. Following the literature, skewness will be measured using historical sample third moments normalized by variance and quartile skewness, which is robust to outliers. Investors have skewness preference on asset level, which is considered to be a behavior bias, if they pick high skewed asset holding other asset characteristics unchanged. In contrast, investors have skewness preference on portfolio level, which is considered to be a rational behavior, if portfolio skewness exceed market skewness systematically.

In the second part of the project, We will decompose portfolio skewness in different ways to study the source of skewness in individual's portfolio. By looking at different compostions of portfolio skewness and portfolio construction, we can learn where investors gain skewness from.

In the third part, We study the relationship between risk aversion and skewness preference reflected from individual portfolio choice through a series of tests. By studying the interaction between this relationship and wealth, We will try to differenciate theoretical frameworks and to answer the question that whether skewness preference itself or the relationship between risk aversion and skewness preference depends on any other factors. And by studying the interaction between this relationship and labor income or education level, we motivate a richer portfolio choice model incorporating labor income risk and life cycle choice.

Research Budget Estimation

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Currency:
Dollar ($)

Description	Quantity	Unit Price	Amount
Equipment Spend[1]			
Computer	1	2,000	2,000
Research Spend			
Research Assistant[2]	400hrs	20 /hr	8,000
Travel to Stockholm[3]	5	200	1,000
Accommodation at Stockholm[4]	3months	1,500	4,500
Other Spend[5]			
Participation Fee	3	200	600
Travel Spend	3	1,000	3,000
Total			**19,100**

[1] A powerful computer is needed for heavy computation of higher moments characteristics.
[2] Data is accessible only from Swedish territory. Research assistant on site is needed to keep the ongoing project from interruption due to mobility limit.
[3] Frequent visits to Stockholm Swedish House of Fiance are needed.
[4] A total period of 3 months is expected to be spended at Swedish House of Finance in order to work on the data.
[5] The project is expected to be presented 2 to 3 times at external research institutions during the year of 2018.

ZHANG Yapei
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Education

- **Swedish House of Finance** — Stockholm, Sweden
  Visiting Fellow — *2017.1 - present*
- **University of British Columbia** — Vancouver, Canada
  Visiting Fellow — *2016.2 - 2016.8*
- **HEC Paris** — Paris, France
  Ph.D. Candidate in Finance — *2014 - present*
- **Ecole Polytechnique - Paris School of Economics** — Paris, France
  MSc in Analyse Politics and Economics — *20013.9 - 2014.7*
- **Ecole Polytechnique - HEC paris** — Paris, France
  MSc in Quantitative Economics and Finance — *2012.9 - 2013.7*
- **Claude Bernard University** — Lyon, France
  Bachelor in Applied Mathematics and Social Science — *2009.9 - 2012.7*

Working Papers

- **Skewness Preference in Portfolio Choice.**

  We study the cross-section heterogeneity of household preference under a general disappointment aversion framwork.

- **Multifractal Volatility with Shot-Noise Component.** (with Laurent E. Calvet)

  We propose a discrete-time volatility model labeled Shot-Noise Multifractal model, designed to capture the jump and decaypattern in volatility process along with other stylized facts.

- **Volatility Forcasting with Mixed Frequency Data.**

  Volatility process exhibit multifrency behavior. We try to forcast volatility in a reduced form using MIDAS method.

Working Experiences

- **Research Assistant** — Stockholm, Sweden
  in Swedish House of Finance — *2016 - present*
- **Financial Ingenieer** — Paris, France
  in RiskDesign SAS — *2013.4 - 2013.8*

Programing Languages

- **Proficient:** Matlab, STATA **Familiar with:** R

DEPARTMENT OF FINANCE

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Recommendation Letter for ZHANG Yapei

Stockholm, 16th of March 2017

To Whom It May Concern,

It is my great pleasure to write a reference letter for Yapei ZHANG's application of the NBER Household Finance Research Grant.

I have known Yapei since early 2016, when she worked as research assistant for a joint project with Laurent Calvet, John Campbell and Francisco Gomes on the cross section of household preferences. The project involves reverse engineering the preference parameters of Epstein-Zin utility from observed lifecycle wealth accumulation and risk taking of households. Yapei has been an extraordinary research assistant, grasping quickly and implementing effectively the specific GMM identification methodology of the paper.

As Yapei worked on the Swedish micro-data, she decided to explore portfolio skewness in household holdings, and how preferences for higher return moments relates to risk aversion, and to household characteristics, such as education and income risk. I believe this is very promising work that can be uniquely explored with the Swedish Wealth and Income Registry. For this reason, it is vital for Yapei to be in Stockholm while she works on the data, and to use the help of local research assistants while she is at HEC.

In conclusion, I would highly recommend Yapei ZHANG for the NBER Household Finance Research Grant. She is a smart, hard working, and promising young scholar, uniquely positioned to greatly benefit from the grant to finance her access to the data in Stockholm and her research agenda.

Please feel free to contact me for any question.

Sincerely,



Paolo Sodini