RGC Ref. No.:
UGC/FDS24/B05/15
(please insert ref. above)

RESEARCH GRANTS COUNCIL
COMPETITIVE RESEARCH FUNDING SCHEMES FOR
THE LOCAL SELF-FINANCING DEGREE SECTOR

FACULTY DEVELOPMENT SCHEME (FDS)

Completion Report
(for completed projects only)

Submission Deadlines:
1. *Auditor's report with unspent balance, if any: within **six** months of the approved project completion date.*
2. *Completion report: within **12** months of the approved project completion date.*

Part A: The Project and Investigator(s)

1. Project Title

Is R&D Rewarded by the Stock Market? Evidence from China

2. Investigator(s) And Academic Department(s) / Unit(s) Involved

Research Team	Name / Post	Unit / Department / Institution
Principal Investigator	XU Ming/ Senior Lecturer	PolyU SPEED
Co-Investigator(s)	NG, Artie Wai-cheong/ Principal Lecturer, Deputy Director	PolyU SPEED
Others	N. A.	N.A.

3. Project Duration

	Original	Revised	Date of RGC / Institution Approval *(must be quoted)*
Project Start Date	01-01-2016	N.A.	N.A.
Project Completion Date	31-12-2017	N.A.	N.A.
Duration *(in month)*	24	N.A.	N.A.
Deadline for Submission of Completion Report	31-12-2018	N.A.	N.A.

Part B: The Final Report

5. Project Objectives

5.1 Objectives as per original application

1. Is R&D rewarded by Chinese stock markets? i.e. Is R&D intensity positively related to the average stock returns in China?

2. Is R&D intensity positively related to the total risk of stock returns?
3. Is R&D intensity positively related to the systematic risk of returns?
4. Is R&D of Chinese firms better recognized and rewarded in stock markets like Hong Kong and US? What are the similarities and differences of the relationship between the expected stock return and the R&D intensity for Chinese firms in these stock exchanges?

5.2 Revised objectives

Date of approval from the RGC:	N.A.
Reasons for the change:	N.A.
	N.A.

5.3 Realisation of the objectives

(Maximum 1 page; please state how and to what extent the project objectives have been achieved; give reasons for under-achievements and outline attempts to overcome problems, if any)

In this project, we want to analyze the relationship between the expected stock return and the research and development (R&D) intensity for Chinese firms from 2007 to 2014 by using the cross-sectional regression approach.

There are different sources for the R&D data of Chinese firms. After comparing different databases such as CSMAR, WIND and DATASTREAM, we found that there were some discrepancies among those sources. Finally we decided to use CSMAR data as the main source and then checked whether the R&D expenditure data was expense or capitalized one by hand. We need to read the annual reports of Chinese listed firms in some occasions to clarify the reporting method. Although it takes time, it is important because the R&D expense and capitalized R&D have different implications for our study. According to the new standard of accounting which was released in 2006, effective from 1 January 2007, listed companies are required to report information of their R&D expenditures in the notes to the financial statements in the annual reports. Some firms choose to report such R&D figures in their 'Report of Board of Directors' for that financial period. Therefore our sample period starts from 2007, in which Chinese listed companies started to report R&D figures more systematically.

We do find that more and more Chinese listed firms started to spend on R&D, which is consistent with the 2015 Global Innovation 1,000 study. R&D spending by companies headquartered in China has gone up by 3,285% since 2005. China's investment in R&D has increased dramatically in recent years. We find the young non-state-owned listed firms with larger firm size, higher firm liquidity, less dominating largest shareholder, and higher managerial shareholdings tend to have more R&D expenditures in China. We further examine the relationship between the R&D intensity and future stock returns for Chinese firms from 2007 to 2014 using the cross-sectional regression approach. It turns out that R&D is rewarded by the Chinese stock market. R&D is significantly and positively related to both stock returns and systematic risks. The higher returns from R&D investments do come from their higher systematic risks, which is consistent with the modern finance theory. The Chinese data provide an opportunity to examine the theory empirically, in addition to the evidence from the US and Japan which are the two main spenders in R&D investment over the world.

This project also has implications to regulators. Even if there is criticism that capitalization of R&D expenditure could create opportunity for earnings management, our empirical findings shows evidence of value relevance of capitalized R&D expenditures. In other words, R&D capital provide additional information to the equity market and is deemed as useful information by investors, even in emerging markets like China.

As for the comparison among the different markets which is the last research objective, we collect the data from DATASTREAM and do the preliminary test. The result is not the same as what we expected. Not a lot of the Chinese firms listed in Hong Kong or US stock market are actively involved in R&D activities. Therefore we could not do the regression analysis on the limited data.

5.4 Summary of objectives addressed to date *

Objectives *(as per 5.1/5.2 above)*	**Addressed** *(please tick)*	**Percentage Achieved** *(please estimate)*
1. *Is R&D rewarded by Chinese stock markets? i.e. Is R&D intensity positively related to the average stock returns in China?*	⁄	100%
2. *Is R&D intensity positively related to the total risk of stock returns?*	⁄	100%
3. *Is R&D intensity positively related to the systematic risk of returns?*	⁄	100%
4. *Is R&D of Chinese firms better recognized and rewarded in stock markets like Hong Kong and US? What are the similarities and differences of the relationship between the expected stock return and the R&D intensity for Chinese firms in these stock exchanges?*	⁄	70%

- *****Note: These objectives were addressed in the paper titled as 'Is R&D rewarded by the stock market? Evidence from China' presented at the 30th Australasian Finance & Banking Conference.

Research Outcome

6.1 Major findings and research outcome
(Maximum 1 page; please make reference to Part C where necessary)

In 2016, we submitted a proposal to R&D Management Conference - From Science to Society: Innovation and Value Creation, University of Cambridge. The proposal is titled as 'An Investigation of Global R&D Centers as Strategic Investments: Complementarity of Public and Private Funding in Regional Innovation Systems'. Dr. Ng attended the conference in July 2016, presented the proposal and collected valuable comments from the conference participants.

We then submitted a working paper titled as 'Is R&D rewarded by the stock market? Evidence from China' to the 30th Australasian Finance & Banking Conference. It was accepted for presentation. The paper was prepared in collaboration with Dr. Jian Ming at Nanyang Technological University. Dr. Xu attended the 30th Australasian Finance & Banking Conference in Dec 2017 and presented the paper. She collected constructive comments from the conference participants.

In this paper, it highlights that China's investment in R&D has increased dramatically in recent years. The relation between the R&D intensity and stock performance however has not been investigated in-depth in China. We find the young non-state-owned listed firms with larger firm size, higher firm liquidity, less dominating largest shareholder, and higher managerial shareholdings tend to have more R&D expenditures in China. We further examine the relationship between the R&D intensity and future stock returns for Chinese firms from 2007 to 2014 using the cross-sectional regression approach. It turns out that R&D is rewarded by the Chinese stock market. R&D is significantly and positively related to both stock returns and systematic risks. The higher returns from R&D investments do come from their higher systematic risks, which is consistent with the modern finance theory. The Chinese data provide an opportunity to examine the theory empirically, in addition to the evidence from the US and Japan which are the two main spenders in R&D investment over the world.

Based on the valuable comments and suggestions from conference participants, we revised the paper and sent it to the *Journal of Banking and Finance*. Unfortunately, the paper was rejected. However, we received some valuable comments from the reviewers. Later we will refine the analysis, revise the paper and consider other potential channels of publication.

6.2 Potential for further development of the research and the proposed course of action
(Maximum half a page)

As mentioned before, we received some valuable comments from conference participants and reviewers. Later we will refine the analysis and revise the paper. According to the comments from journal reviewers, we will examine some unexpected R&D spending announcements to see how the market responds to these unexpected events, which might provide a better test for our purpose. Then we will submit it to some academic journals such as *Financial Analysts Journal* and *Journal of Accounting and Public Policy*.

6. Layman's Summary

(Describe in layman's language the nature, significance and value of the research project, in no more than 200 words)

China's investment in research and development (R&D) has increased dramatically in recent years. The relation between the R&D intensity and stock performance however has not been investigated in-depth in China. We find the young non-state-owned listed firms with larger firm size, higher firm liquidity, less dominating largest shareholder, and higher managerial shareholdings tend to have more R&D expenditures in China. We further examine the relationship between the R&D intensity and future stock returns for Chinese firms from 2007 to 2014 using the cross-sectional regression approach. It turns out that R&D is rewarded by the Chinese stock market. R&D is significantly and positively related to both stock returns and systematic risks. The higher returns from R&D investments do come from their higher systematic risks, which is consistent with the modern finance theory. The Chinese data provide an opportunity to examine the theory empirically, in addition to the evidence from the US and Japan which are the two main spenders in R&D investment over the world.

Part C: Research Output

7. Peer-Reviewed Journal Publication(s) Arising Directly From This Research Project
(Please attach a copy of the publication and/or the letter of acceptance if not yet submitted in the previous progress report(s). All listed publications must acknowledge RGC's funding support by quoting the specific grant reference.)

The Latest Status of Publications				Author(s) *(denote the corresponding author with an asterisk*)*	Title and Journal / Book *(with the volume, pages and other necessary publishing details specified)*	Submitted to RGC *(indicate the year ending of the relevant progress report)*	Attached to this Report *(Yes or No)*	Acknowledged the Support of RGC *(Yes or No)*	Accessible from the institutional repository *(Yes or No)*
Year of Publication	**Year of Acceptance** *(For paper accepted but not yet published)*	**Under Review**	**Under Preparation** *(optional)*						
Nil									

8. Recognized International Conference(s) In Which Paper(s) Related To This Research Project Was / Were Delivered
(Please attach a copy of each conference abstract)

Month / Year / Place	Title	Conference Name	Submitted to RGC *(indicate the year ending of the relevant progress report)*	Attached to this Report *(Yes or No)*	Acknowledged the Support of RGC *(Yes or No)*	Accessible from the institutional repository *(Yes or No)*
July 2016, Cambridge, UK	An Investigation of Global R&D Centers as Strategic Investments: Complementarity of Public and Private Funding in Regional Innovation Systems	R&D Management Conference - From Science to Society: Innovation and Value Creation, University of Cambridge	Yes, *(2016)*	Yes (please refer to Attachment 1)	Yes	No
Dec 2017, Sydney, Australia	Is R & D rewarded by the stock market? Evidence from China	The 30th Australasian Finance & Banking Conference	No	Yes (please refer to Attachment 2)	Yes	No

9. Whether Research Experience And New Knowledge Has Been Transferred / Has Contributed To Teaching And Learning
(Please elaborate)

Not yet. However, we are considering the potentials to incorporate some of the findings of this study into the course materials of Business Finance, Corporate Finance and other business-related subjects where appropriate.

10. Student(s) Trained

(Please attach a copy of the title page of the thesis)

Name	Degree Registered for	Date of Registration	Date of Thesis Submission / Graduation
Nil			

11. Other Impact

(e.g. award of patents or prizes, collaboration with other research institutions, technology transfer, teaching enhancement, etc.)

The research team is exploring collaboration with researchers in Nanyang Technological University of Singapore in jointly developing a research paper related to the theme of this project.

12. Public Access Of Completion Report

(Please specify the information, if any, that cannot be provided for public access and give the reasons.)

Information that Cannot Be Provided for Public Access	Reasons
Nil	

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FACULTY DEVELOPMENT SCHEME (FDS)

Completion Report - Attachment
(for completed projects only)

RGC Ref. No.:	UGC/FDS24/B05/15
Principal Investigator:	Xu Ming
Project Title:	Is R&D Rewarded by the Stock Market? Evidence from China

Statistics on Research Outputs

	Peer-reviewed Journal Publications	Conference Papers	Scholarly Books, Monographs and Chapters	Patents Awarded	Other Research Outputs (Please specify)
No. of outputs arising directly from this research project [or conference]	0	2	0	0	Nil