FDS8 (Oct 2019)

RGC Ref. No.: UGC/FDS16/B17/19 (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
	2.	the approved project completion date. Completion report: within $\underline{12}$ months of the approved project completion date.

Part A: The Project and Investigator(s)

1. Project Title

The influence of environmental concern on green bond yield

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

Research Team	Name / Post	Unit / Department / Institution
Principal Investigator	Dr HO Wai-ming / Assistant Professor	Lee Shau Kee School of Business and Administration / Hong Kong Metropolitan University
Co-Investigator(s)	Mr LEUNG Wai-ho	NA
Others		

3. Project Duration

	Original	Revised	Date of RGC / Institution Approval (must be quoted)
Project Start Date	1 / 1 / 2020	NA	
Project Completion Date	31 / 12 / 2021	31 / 12 / 2022	14 / 6 /2022
Duration (in month)	24 months	36 months	14 / 6 /2022
Deadline for Submission of Completion Report	31 / 12 / 2022	31 /12 / 2023	14 / 6 /2022

4.4 Please attach photo(s) of acknowledgement of RGC-funded facilities / equipment.

Part B: The Final Report

5. Project Objectives

- 5.1 Objectives as per original application
 - 1. Develop a new methodology for measuring the subjective environmental concern at a territory and national level using online search activity.
 - 2. Analyse empirical behavior of the environmental concern indicator across time and geographical areas.
 - 3. Examine whether yields of green bonds are lower than those of conventional bonds.
 - 4. Determine whether the yield of a green bond is affected by the degree of environmental concern of the territory where the bond is issued.

5.2 Revised objectives

Date of approval from the RGC:	NA
Reasons for the change:	NA

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*)

The four objectives of this project have been successfully achieved.

The first objective was accomplished by extracting a comprehensive list of keywords potentially correlated with environmental concern from the publications of esteemed environmental organizations such as the United Nations Environment Programme (UNEP) and the Organisation for Economic Co-operation and Development (OECD). These keywords were then categorized into five groups: climate change, air quality, water pollution, waste, and biodiversity. The search frequencies for each keyword were obtained from Google Trends, and these frequencies were used to compile a big data measure of environmental concern.

The second objective was met by appointing a full-time research assistant and two part-time research assistants to collect online search data from 42 countries or territories worldwide. This multinational online search data was used to examine the variation of environmental concern over time and across different geographical areas.

To achieve the third objective, we gathered worldwide data on green bonds to examine whether the yields of green bonds are lower than those of conventional bonds. We constructed a database of yields for matched pairs consisting of a green bond and its synthetic conventional bond. The researchers collected daily bond data for all territories and countries where green bonds were issued and where Google search was available for the period 2013-2020. Financial data on green bonds and conventional bonds were captured from the Bloomberg database.

The fourth objective was fulfilled by testing an empirical model to determine whether the yield of a green bond is influenced by the degree of environmental concern in the territory where the bond is issued. This allowed us to understand which geographical areas have an advantage in developing the green bond market.

5.4 Summary of objectives addressed to date

O (<i>a</i> :	bjectives s per 5.1/5.2 above)	Addressed (please tick)	Percentage Achieved (please estimate)
1.	Develop a new methodology for measuring the subjective environmental concern at a territory and national level using online search activity.	~	100%
2.	Analyse empirical behavior of the environmental concern indicator across time and geographical areas.	\checkmark	100%
3.	Examine whether yields of green bonds are lower than those of conventional bonds.	√	100%
4.	Determine whether the yield of a green bond is affected by the degree of environmental concern of the territory where the bond is issued.	\checkmark	100%

6. Research Outcome

6.1 Major findings and research outcome

(Maximum 1 page; please make reference to Part C where necessary)

This project has a number of findings and research outcomes.

First, this project compiles an observable and timely measure of the subjective environmental concern in a territory using big data. Online searching activities is the big data used in this project. With the new measure of environmental concern, people can determine the influence of environmental concern on various government policies, social issues and financial markets. It is also found that keywords associated with climate change, water pollution and waste management are the strongest predictors of subjective environmental concern.

Second, multinational online search data on environmental concern have been collected for examining how environmental concern varies over time and across countries. The findings revealed that environmental concern was exceptionally strong in small island developing states, followed by major western countries.

Third, this project examines the influence of environmental concern among investors on the yield of a green bond. The findings indicated that the yields of green bonds are lower than those of conventional bonds, although the result was statistically insignificant.

Fourth, an empirical model was developed to determine whether the yield of a green bond is influenced by the degree of environmental concern in the territory where the bond is issued. However, the data did not reveal any identifiable relationship.

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

The big data measure of environmental concern developed in this project could be very useful for future research.

First, one can use the measure to track changes in environmental concern over time. This could provide valuable insights into the effectiveness of environmental campaigns, or the impact of major environmental events on public attitudes.

Second, researchers can use the measure to explore correlations between environmental concern and other variables. For example, they might investigate whether people with higher levels of environmental concern are more likely to engage in sustainable behaviors, or whether they have different political or social attitudes.

It is proposed that a data repository could be used to store and share our data. Repositories like Figshare, Zenodo, or the Open Science Framework allow people to upload their data and make them publicly available.

7. Layman's Summary

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

This project has examined the influence of environmental concern among investors on the yield of a green bond. Green bonds are debt instruments specifically earmarked to be used for projects with an environmental goal. Faced with rapidly growing need to invest in environment-friendly projects and growing demand from investors for green assets, green bond issuance has skyrocketed in recent years.

One of the novel ideas of this project is to make use of online search activity to measure and track the trend in subjective environmental concern that are traditionally captured by surveys.

The results of the study have important contributions to both academics and practitioners: (1) extend the sustainable finance literature in the relation between environmental concern and bond yield; (2) offer advice to investors who invest in bonds that comply with certain green bond standards and guidelines; (3) provide implications to governments, central banks and regulatory bodies driving green bonds market in order to achieve sustainable development.

Part C: Research Output

8. Peer-Reviewed Journal Publication(s) Arising <u>Directly</u> 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	e Latest Stat	us of Publica	ations		Title and Journal / Book				
Year of Publication 2023	Year of Acceptance (For paper accepted but not yet published)	Under Review	Under Preparation (optional)	Author(s) (denote the correspond- ing author with an asterisk [*]) Agol Wai Ming Ho* Kevin Chi Keung Li	(with the volume, pages and other necessary publishing details specified) Big Data Measures of Environme ntal Concern / Journal of Applied Business and Economics	Submitted to RGC (indicate the year ending of the relevant progress report)	Attached to this Report (Yes or No) Yes (Attachme nt)	Acknowledged the Support of RGC (Yes or No) Yes	Accessible from the Institutional Repository (Yes or No) Yes
			Yes	Agol Wai Ming Ho*	/ p. 42-46 The influence of environme ntal concern on green bond yield	No	No	Yes	Yes

9. 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)
12 / 2021 / Hong Kong	Big data measures of environmental concern	IIBG 2021 Annual Academia-Industry Exchange Academic Conference	Yes (2022)	No	Yes	Yes

10. Whether Research Experience And New Knowledge Has Been Transferred / Has Contributed To Teaching And Learning

(Please elaborate)

As the researchers were responsible for a number of finance courses in undergraduate

education, the project has updated them about the current development in the field of

sustainable finance.

11. 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
NA			

12. Other Impact

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

NA

13. Statistics on Research Outputs

	Peer-reviewed Journal Publications	Conference Papers	Scholarly Books, Monographs and Chapters	Patents Awarded	Other Rese Output (please spe	earch s cify)
No. of outputs arising directly from this research project	1	1			Туре	No.

14. 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
NA	