

Re: Nord Grant Applications

March 29, 2019

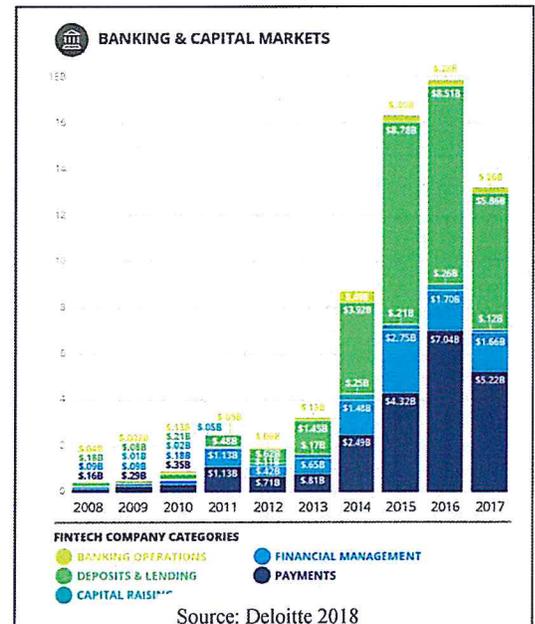
Dear UCITE Committee Members:

*I seek start-up funding to modernize the Banking Analytics and Capital Markets curriculum by incorporating Financial Technologies (Fintech) that utilize Python simulation-based educational technology (EdTech) to provide a contextual environment to study banking and financial intermediation. This initiative is titled 'FinTech as EdTech: Modernizing the Curriculum Content of Banking and Financial Intermediation to Enhance Contextual Learning.'*

**What is the purpose of this initiative?** The purpose of this initiative is to modernize banking and capital markets curriculum to incorporate Financial Technologies (FinTech) that utilize Python based simulations that serve as educational technology (EdTech) in the following courses: BAFI/MSM 434: Financial Analytics and Banking BAFI/MSM 480: Capital Markets and Global Banking

**What is the rationale for this initiative?** The landscape of financial intermediation by banks and provision of financial services have changed dramatically. According to the Department of the Treasury (2018), about 4000 new technology-based firms serving the banking and financial services industry have been created over the last 3 years. The number continues to grow. 40% of these firms are focused on banking and capital markets<sup>1</sup>.

Currently, I offer two courses in the area of banking, banking analytics, financial intermediation and capital markets: BAFI-MSM 434: Financial Analytics and Banking (Fall, Enrollment=58) BAFI-MSM 480: Capital Markets and Global Banking (Spring, 2019 Enrollment=52). These are popular courses taken by Masters and Integrated Masters degree students in the Management School. FinTech industries are a potential employer for these students after graduation. Currently, BAFI 335 Introduction to FinTech is taught on a standalone basis. It is important, however, that students learn financial technologies in the context of banking and financial intermediation, which are the main conduits for FinTech. This proposal will accomplish this goal.



To make the content easier and offer an effective learning experience, I propose to create simulation-based content that will teach FinTech in both courses. I will utilize Python to build the simulation tools to make the content interactive and experiential. The two courses provide an ideal canvas to link the various financial technologies to financial intermediation and capital markets. The teaching of FinTech within the context of banking, capital markets and financial intermediation will provide students with **contextual learning** as opposed to a standalone course in FinTech<sup>2</sup>. The proposed use of Python based simulation tools will enable students to visualize and simulate various financial interactions that will help them understand how exactly the flow of these interactions take place. For example, a peer-to-peer lending tool can be developed to show students how peer-to-peer (P2P) loans are made. Students can simulate the Peer-to-peer lending environment by making loans to each other and learning how exactly loans are scored and selected. This allows for a hands-on approach to learning FinTech. Currently, to my knowledge, there are no educational tools to teach FinTech. Teaching and learning Fintech within banking courses provides a very organic and contextual way of learning financial technologies. Infusion of FinTech education tools become part of the education technology when teaching financial intermediation, banking and functioning of capital markets.

<sup>1</sup> United States Department of the Treasury Report, (2018). A Financial System that Creates Economic Opportunities Nonbank Financials, Fintech and Innovation.

<sup>2</sup> Johnson, E. B. (2002). Contextual teaching and learning: What it is and why it is here to stay. Corwin Volume.

**What is the value-add of Fintech as EdTech?** Table 1 provides a summary of current content offered in both courses. The second column indicates suitable areas where Fintech concepts can be contextually introduced with simulation tools. This helps to ensure relevancy and currency of topics taught. It should be noted that while there is additional content, due to the way it is delivered (e.g., using simulation tools), there won't be additional lecture time needed to incorporate these changes.

| BAFI 434: Financial Analytics and Banking   | FinTech Simulations to be incorporated into current course structure.   | BAFI 480: Capital Markets and Global Banking | FinTech Simulations to be incorporated into current course structure. |
|---|---|--|---|
| Introduction to SAS                         |   | Capital Markets Overview                     | Initial Public Offerings versus Initial Coin Offerings                |
| Data preprocessing for Credit Risk Modeling |   | Equity Market                                | Cryptocurrency, Bitcoin   |
| Credit Scoring                              | Fintech and FICO?<br>Peer-to-Peer Lending and Credit Scoring<br><br>Marketplace lending, P2P Lending, Algorithmic Lending | Debt Market                                  | FinTech and Fixed Income  |
| PD,LGD, EAD                                 | FinTech and Credit Pricing  | Securitization                               | Electronic Mortgages  |
| Stress Testing                              | FinTech and Systemic Risk   | Financial Regulation                         |   |
| Banking Regulation                          | RegTech (Regulatory Technology). Regulatory implications of Artificial Intelligence                                       | Bank Performance Evaluation                  | Bankless Technologies<br>Digital Asset Holdings                       |

Table 1: Current course content and potential FinTech simulation tools.

**How impactful is this initiative?** Students will greatly benefit from a curriculum that is contextual and simulation-based to reflect impactful technological changes that is taking place in the financial sector. They will be studying Fintech within the context of banking. This contextual and simulation based learning will add more value than a stand-alone FinTech course. Contextual and simulation based pedagogy has been found to improve student learning and problem solving. Since, all learning is applied knowledge, studying FinTech in the context of banking and financial intermediation will enhance interdisciplinary thought and provide an ideal canvas to form these interconnections.

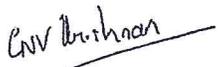
**How will this be professionally impactful?** As a junior teaching faculty, it is very important that my course content reflect the ever-changing financial services environment. It is integral that I develop teaching tools that are cutting-edge in meeting financial industry needs. My prior position at the Cleveland Federal Reserve Bank as a regulatory economist has trained me to take a “forward-looking” approach to identifying issues, challenges and opportunities in the financial services industry. I have been trained to look ahead of the curve as opposed to being responsive to changes. I see myself as being an educator who can train students to be ahead of the curve so that they can seek opportunities as oppose to merely responding to changes. This opportunity will help me to become more effective in delivering content and improve learning experience of the students.

**How will the performance of the initiative be evaluated?** Students will be surveyed at the end of the course. The response from the feedback will be used to improve upon the simulation tools. Several rounds of feedback will be collected to evaluate performance and make improvements to the simulation tools.

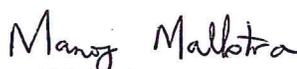
Sincerely,



Lakshmi Balasubramanyan  
Assistant Professor  
Dept. of Banking and Finance



C N V Krishnan  
Professor and Chair  
Dept. of Banking and Finance



Manoj Malhotra  
Dean, Weatherhead School of Management  
Albert J Weatherhead, III Professor of Management



CASE WESTERN RESERVE  
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March 31, 2019

To: UCITE Nord Grant Committee

Dear Committee,

I write this letter of support for Prof. Lakshmi Balasubramanyan's Nord grant application entitled "*FinTech as EdTech: Modernizing the Curriculum Content of Banking and Financial Intermediation to Enhance Contextual Learning.*" Prof. Balasubramanyan joined the Department of Banking and Finance as an Assistant Professor in Aug 2017. Prior to this appointment, she was a Research Economist at the Federal Reserve Bank of Cleveland. In the Weatherhead School of Management, Lakshmi teaches key courses in Banking Analytics, Capital Markets, and Financial Modeling. She is an integral part of our strategy to enhance analytical content in our curriculum to attract strong undergraduate and graduate in Finance.

In her Nord grant application, Prof. Balasubramanyan proposes to integrate FinTech simulation tools with content for the courses BAFI-MSFI 434 Banking Analytics and Finance, and BAFI-MSFI 480: Capital Markets and Global Banking. I find this innovative and impactful. FinTech is an emerging innovation in financial industry that is rapidly replacing conventional methods of offering financial services. Producing graduates with contextual knowledge of FinTech will greatly help the students find placements in such industries. In addition, this will also help our Department to be ahead of the curve in teaching such technologies. Further, the simulation tools will help students learn the topic more effectively. Prof. Balasubramanyan has taught BAFI-MSFI 434 before with very good student evaluation ratings of 4.78 in Fall 2017 and 4.37 in Fall 2018. She is currently teaching BAFI-MSFI 480 for the first time. I am very confident that her proposed changes will further enhance the learning experience for the students.

In summary, Prof. Balasubramanyan's Nord grant application is very strong in significance and innovation. I strongly support the application. If you have any questions, please do not hesitate to contact me.

Sincerely,

A handwritten signature in black ink that reads "C.N.V. Krishnan".

C.N.V. Krishnan  
Professor, Chair, and MSM-Finance Director  
Department of Banking and Finance  
The Weatherhead School of Management  
Case Western Reserve University  
Email: cnk2@case.edu

Proposed Budget Document

Nord Grant Application 2019

Name: Lakshmi Balasubramanyan, PhD

Title of Project: *FinTech as EdTech: Modernizing the Curriculum Content of Banking and Financial Intermediation to Enhance Contextual Learning.*

Department: Banking and Finance

School: Weatherhead School of Management

***What are the budgetary needs?*** I request funds to recruit a part-time Case undergraduate student with coding background to help with the creation of Python-based FinTech simulation tools. The estimated cost is \$3000, broken down as described below:

| Expenses   |               |
|--|---------------|
| Fall 2019, Case Undergraduate student with Python coding background.<br>10 hours/week @ \$15 per hour for 10 weeks   | \$1500        |
| Spring 2020, Case Undergraduate student with Python coding background.<br>10 hours/week @ \$15 per hour for 10 weeks | \$1500        |
| <b>Total Expenses</b>  | <b>\$3000</b> |



Lakshmi Balasubramanyan  
Assistant Professor  
Dept. of Banking and Finance

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## **EDUCATION**

Ph.D., Applied Economics, The Pennsylvania State University, May 2008  
M.S., Finance, The Pennsylvania State University, September 2005  
M.A., Economics, National University of Singapore, June 2003  
B.A., Economics, National University of Singapore, June 1999

## **EXECUTIVE EDUCATION**

Blockchain for Business, Cornell University, Completion in May 2019

## **PROFESSIONAL EXPERIENCE**

July 2017 – Present                      Assistant Professor of Finance, Banking and Finance Department, Case Western Reserve University, Cleveland, OH

July 2018 – June 2019                      Short Term Consultant, The World Bank, Washington D.C.

March 2017 – June 2017                      Senior Quantitative Specialist, Bank Supervision & Regulation, Federal Reserve Bank of Cleveland, OH

July 2011 – Feb 2017                      Research Economist, Bank Supervision & Regulation, Federal Reserve Bank of Cleveland, OH

   Wholesale Credit Risk Specialist, Wholesale Credit Stress-Test (CCAR) Supervisory Modeling Team (SMT), Federal Reserve Bank of Chicago

August 2008 – June 2011                      Assistant Professor of Finance, Scott College of Business, Indiana State University, Terre Haute, IN

## **REFEREED ACADEMIC PUBLICATIONS**

2019    “How Do Banks Use Their Private Information in the Syndicated Loan Market?” February 2019, *Forthcoming, Journal of Financial Stability* (with Allen Berger and Matthew Koepke)

2016    “Evidence of Forward-Looking Loan Loss Provisioning with Credit Market Information,” July 2016, DOI: 10.1007/s10693-016-0255-0, *Journal of Financial Services Research* (with James B. Thomson and Saeed Zaman).

2016    “Credit Market Information Feedback,” July 2016, DOI: 10.1007/s11293-016-9501-y, *Atlantic Economic Journal* (with James B. Thomson, Ben Craig and Saeed Zaman).

2013    “Bank Balance Sheet Dynamics under a Regulatory Liquidity-Coverage Ratio (LCR) Constraint,” September 2013, *Journal of Macroeconomics* Volume 37, No. 1, pp 53-67. (with David VanHoose).

2013    “Do House Prices Impact Business Starts?” March 2013, *Journal of Housing Economics* Volume 22, No. 1, pp 36-44. (with Edward Coulson).

2012    “Generalized Maximum Entropy Approach to Commercial Bank Size and Variance Heterogeneity in Risk,” July 2012, *Journal of Economics and Finance* Vol 36, No.3, pp 728-749. (with Spiro Stefanou and Jeffrey Stokes).

2010    “Declining Cost Efficiency as a Signal of Increasing Bank Vulnerability: An Entropy Based Approach,” January 2010, *Applied Economics Letters* Volume 17, No. 18, pp 1769-1778. (with Spiro Stefanou and Jeffrey Stokes).

2010    “How well is Productivity Being Priced?” October 2010, *Journal of Economics and Finance* Volume 34, No. 4, pp 415-429. (with Ramesh Mohan).

2008    “Credit Risk Rating Migration and Unobserved Borrower Heterogeneity,” October 2008, *Agricultural Finance Review* Volume 68, Issue 2, pp 237-253. (with Jeffrey Stokes and Jonathan Dressler).