Miguel Acosta
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December 9, 2019

Professor Yuriy Gorodnichenko
National Bureau of Economic Research
Cambridge, MA

Dear Professor Gorodnichenko,

I am attaching an application for the NBER's Behavioral Macroeconomics Research Boot Camp. This sounds like an excellent event and I hope that my application is strong enough to warrant acceptance. I am in my fourth year of graduate school at Columbia. Professor Hassan Afrouzi, one of my advisors at Columbia, has agreed to submit a letter of recommendation on my behalf.

Thank you for organizing this, and please let me know if you require any additional information.

Sincerely,

Miguel Acosta
PhD Candidate
Department of Economics
Columbia University

December 2019

Miguel Acosta

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m.acosta@columbia.edu

EDUCATION

Columbia University (New York, NY) 2016 – Present.
PhD Student, Economics
MPhil Economics (2019)
MA Economics (2017)
Fields: Macroeconomics and Behavioral Economics

George Washington University (Washington, DC) 2014 – 2016.
Graduate Certificate in Mathematics

Stanford University (Stanford, CA) 2010 – 2014.
BA Economics, with departmental honors

PUBLICATION

"Using Occupation to Measure Intergenerational Mobility: Do Snapshots Matter?" with Bhashkar Mazumder. *The ANNALS of the American Academy of Political and Social Science*. 2015. 657: 174–193.

WORKING PAPERS & NOTES

"A New Measure of Central Bank Transparency and Implications for the Effectiveness of Monetary Policy." (Previously circulated as "FOMC Responses to Calls for Transparency," in the Federal Reserve Board's FEDS working paper series, number 2015-060).

"The Regressive Nature of the U.S. Tariff Code: Origins and Implications," with Lydia Cox.

"Hanging on Every Word: Semantic Analysis of the FOMCs Postmeeting Statement," with Ellen E. Meade. *FEDS Notes*. 2015. Board of Governors of the Federal Reserve System.

WORKS IN PROGRESS

"Estimating the Effects of Monetary Policy: An Automated Narrative Approach."

"Estimating the Effects of Monetary Policy via High Frequency Factors," with Joseph Saia.

"Rationally Confused: On the Aggregate Implications of Information Provision Policies," with Hassan Afrouzi.

"The Macro-Effects of Unemployment Insurance: A Simulation-Based Discontinuity Design Approach," with Andreas Mueller, Emi Nakamura, and Jón Steinsson.

RELEVANT EMPLOYMENT

2019	**Columbia University** Research assistant for Pierre Yared.
2016 – 2018	**Columbia University** Research assistant for Emi Nakamura, Jón Steinsson, and Andreas Mueller (2017+).
2014 – 2016	**Board of Governors of the Federal Reserve System**, Research Assistant (RA) and Senior RA (2015+), Division of Monetary Affairs, Monetary Studies Unit.
2013	**Federal Reserve Bank of Chicago**, Intern, Economic Research Department, Microeconomic Studies.
2013	**Board of Governors of the Federal Reserve System**, Intern, Division of Banking Supervision and Regulation, Risk Analysis Section.
2012	**Stanford Graduate School of Business**, Research assistant for Jonathan Berk.
2012	**Stanford Education Program for Gifted Youth**, Residential Counselor, assisting with a business class for high school students.
2011	**Office of the City Auditor**, City and County of Honolulu, Intern.

AWARDS AND GRANTS

2019	Vickrey prize for best third year paper (Columbia)
2018	Harriss award for best second year paper (Columbia)
2018	Research grant, awarded by the Washington Center for Equitable Growth ($41,087) for "The Macro-Effects of Unemployment Insurance."
2014	Stanford University Firestone Medal for Excellence in Undergraduate Research.

TEACHING ASSISTANCE

2019 Summer	Global Economic Environment (Executive MBA) with Nicolas Vincent.
2019 Spring	Intermediate Macroeconomics with Martín Uribe.
2018 Fall	Macroeconomic Analysis I (Masters Level) with Ronald Miller.
2017 Fall	Principles of Economics with Sunil Gulati.

PROFESSIONAL SERVICE

Discussions
"Deep Learning Bank Distress from News and Numerical Financial Data." By Cerchiello, Nicola, Ronnqvist, and Sarlin. Nontraditional Data, Machine Learning, and Natural Language Processing in Macroeconomics. Federal Reserve Board, October 2019.

Referee
American Sociological Review; Journal of Banking and Finance; Journal of Money, Credit, and Banking; Quarterly Journal of Economics.

CONFERENCES & SEMINARS

2019	Midwest Macroeconomics Meetings
2016	Federal Reserve Board, International Conference on Computational Social Science.

LANGUAGES
English. Some Spanish and French.

Programming
Familiar: Matlab, Stata, Python, Julia, R, TEX, Linux shell scripting, Dynare, R.
Exposure: Git, Java, C++, VBA, HTML, SAS.

COURSEWORK (all completed)

First-year: Microeconomics, Macroeconomics, Econometrics, Math Methods for Economists, Perspectives on Economic Studies.

Second-Year:

- Macroeconomics field courses: Advanced Macro Analysis I (La'O), Advanced Macro Analysis II (Steinsson), Advanced International Macro (Uribe).
- Behavioral Economics field courses: Behavioral Economics (Dean), Computational Models of Perception and Choice (Woodford).
- Other courses: Macro-econometrics (Ng), Topics in Econometrics (Montiel-Olea).

NBER Behavioral Macroeconomics Research Boot Camp: Application Essay

Miguel Acosta—December 9, 2019

Communication is a cornerstone of modern monetary policy, but there is still much to learn about how information provision influences economic agents' expectations and actions. The question that I am primarily interested in is whether we can separately identify the macroeconomic effects of monetary policy from the effects of the information revealed by monetary policy actions and announcements. I have designed an empirical strategy that leverages text-based data to address this question, and I plan to use what I learn in this boot camp—alongside my previous training in Behavioral Economics and Macroeconomics—to understand the mechanisms underlying my empirical findings. Next, I briefly describe this project. Then I discuss my other research interests in this area.

Estimating and understanding the effects of monetary policy on economic outcomes has been at the center of macroeconomic analysis for decades, but is complicated by the fact that monetary policy is highly endogenous with respect to economic fundamentals. Research in this area generally seeks to address these endogeneity concerns by studying the effects of monetary policy decisions that are deviations from the Fed's typical response to economic conditions. This is true of the vector autoregression (VAR) literature, the work of Romer and Romer (2004), the "narrative approach" (Romer and Romer, 1989), and the "high frequency approach" of identifying the effects of monetary policy. Despite strong arguments in favor of these approaches, each still has its drawbacks. For example, in the case of the narrative approach, studying isolated incidents leads to questions of external validity. These deficiencies are often blamed for puzzling empirical findings regarding the effects of monetary policy. For example, Nakamura and Steinsson (2018) find that contractionary monetary policy shocks tend to raise expectations of output growth. This finding can be seen as the result of an "information effect" of monetary policy: because the Fed tends to increase interest rates when the economy is heating up, a monetary tightening—and accompanying communication—can serve as an informative signal of a positive economic outlook.[1] This revelation has called into question the identifying assumption of the high-frequency approach, which maintains that only information about monetary policy is released when the Fed announces policy. Instead, both the policy rate itself and the accompanying communications might contain non-monetary information to which the public responds.

The goal of my project is to design an empirical strategy that will allow me to distinguish between the effects of monetary policy—monetary policy shocks—and the effects of the information revealed by monetary policy—information shocks. This is a challenging task, because both shocks are emitted at the same time; thus, current estimates of monetary policy shocks are generally unable to distinguish between the two. I identify an information shock via an "automated narrative approach." In particular, I let Fed watchers describe what information was revealed in each policy announcement. After monetary policy decisions are made public, informed observers—e.g. journalists and researchers at financial institutions—write about the policy. By applying machine learning and natural language processing techniques, I directly measure how the discussion of different topics (e.g., inflation or output) respond to monetary policy announcements.[2] I use these measures as detailed proxies for the information content of monetary policy in order to study and estimate the effects of monetary policy on financial market and macroeconomic outcomes. Preliminary results

[1] The presence of these "information effects" provides the foundation for why Nakamura and Steinsson find such surprisingly strong and persistent real effects of monetary policy. Evidence that the Fed has superior (relative to the public) information regarding the macroeconomy was provided by Romer and Romer (2000). A long line of other papers also find surprisingly strong effects of high-frequency monetary policy shocks on other interest rates.

[2] I use a state-of-the-art language analysis algorithm, ELMo, for classifying the topic and tone of sentences.

demonstrate that newspaper-derived measures of information are important for understanding the reactions of real interest rates and expected inflation to monetary policy announcements. Controlling for information also reveals a substantial upward bias in previously-estimated effects of monetary policy on real rates and expected inflation.

My approach has several advantages over previous work. First, measuring the information content of monetary policy announcements directly allows me to test the empirical relevance of Fed information effects. Next, the richness of text permits analysis of the information revealed about detailed topics, which is crucial for understanding the channels through which information effects operate. Macroeconomic theory suggests that the content of the Fed's communication matters for ensuing macroeconomic outcomes—news about a negative supply shock and positive demand shock should have similar effects on inflation (and expectations thereof), but different effects on output. Recent work in this area (e.g. Jarociński and Karadi (Forthcoming)) cannot separately identify news shocks at this level of detail. Finally, the methodology leverages the strength of the traditional narrative approach—by incorporating contemporary analyses of historical events—while mitigating its weaknesses. Because the analysis is automated, it can be extended, replicated, and examined in a way that traditional narrative analyses cannot.

Aside from the project just-described, I hope to continue working within this area of research. There is a trend of monetary policy that increasingly makes use of non-traditional channels, such as forward-guidance, and other communications policies meant to affect the public's expectations. As these non-traditional policies continue to be implemented, it becomes increasingly important to understand how these policies might operate. In a world with perfectly-informed agents, communications by the Fed should not influence any decisions. Deviating from this benchmark, the question is then *how* are agents imperfectly-informed and, further, which behavioral attributes might most-strongly determine their reactions to incoming information. For example, as Woodford (2019) highlights, communications about far-off events may be less potent if agents have a limited ability to plan far into the future. Agents with diagnostic expectations (Bordalo et al., 2018) may overreact to macroeconomic news communicated by the Fed. In work with Hassan Afrouzi, we highlight that in a framework with rationally inattentive agents, firm responses to macroeconomic news might be vastly different depending on those firms' prior experiences. I hope to deepen my understanding of these and other relevant behavioral patterns through this boot camp.

References

Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer, "Diagnostic Expectations and Credit Cycles," *The Journal of Finance*, 2018, *73* (1), 199–227.

Jarociński, Marek and Peter Karadi, "Deconstructing Monetary Policy Surprises—The Role of Information Shocks," *American Economic Journal: Macroeconomics*, Forthcoming.

Nakamura, Emi and Jón Steinsson, "High Frequency Identification of Monetary Non-Neutrality," *Quarterly Journal of Economics*, 2018.

Romer, Christina D. and David H. Romer, "Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz," *NBER Macroeconomics Annual*, 1989, *4*, 121–170.

_ and _, "Federal Reserve Information and the Behavior of Interest Rates," *American Economic Review*, 2000, *90* (3), 429–457.

_ and _, "A New Measure of Monetary Shocks: Derivation and Implications," *American Economic Review*, 2004, *94* (4), 1055–1084.

Woodford, Michael, "Monetary Policy Analysis When Planning Horizons Are Finite," *NBER Macroeconomics Annual*, 2019, *33*, 1–50.

COLUMBIA UNIVERSITY
IN THE CITY OF NEW YORK

ECONOMICS

Hassan Afrouzi
Assistant Professor
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December 9, 2019

RE: Letter of Recommendation for Miguel Acosta

To whom it may concern,

I am pleased to recommend Miguel Acosta for NBER's Behavioral Macroeconomics Research Boot Camp. Miguel's research broadly falls within the boundaries of empirical macro with a special focus on the information effect of monetary policy shocks. I have known Miguel and have interacted with him on a regular basis for the last two and a half years. Since he joined the program in 2016, Miguel has been very productive. The quality of his work is impressive. He has the maturity of understanding what research questions are important in his main area of expertise and the depth of knowledge to make significant contributions in these areas. He is currently working on multiple papers that aim to answer important questions that showcase his abilities as an exceptional PhD candidate. I have been very impressed by Miguel's research and recommend him enthusiastically and without any reservations.

Miguel's main area of interest that covers three of his papers is on the information effects of monetary policy. The core idea in this literature is that the Federal reserve and the private sector of the economy have different information sets and what comes as a surprise to the market might be the reaction of the Federal reserve to endogenous variables in the economy. This channel goes beyond the usual identification strategies for monetary policy shocks and calls for new methods that can separate the information shocks from true surprises. Miguel has two papers in which he comes up with identification strategies to parse out information effects.

In the first paper, for which he was awarded the Best Second Year Paper prize, he uses text analysis of Fed minutes and statements to have a measure of information released by the Fed after every FOMC meeting. An interesting component of this paper is Miguel's focus on the multidimensional nature of the information effects. The FOMC minutes and statements are complex signals designed by the Fed to communicate several potentially independent factors that contributed to the committee's decisions. Thus, the information revealed by the committee's decision on the federal funds rates is only one piece of the puzzle. Miguel's text analysis algorithm aims to capture the

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broader context by directly analyzing the statements, rather than just measuring the surprises in the rates.

In a second paper which is joint with another PhD candidate, Joseph Saia, Miguel comes up with another strategy to identify the information effects of monetary policy shocks. The core idea revolves around comparing *monetary policy surprises* – measured as unexpected changes in federal fund futures after FOMC announcements – with *economic news surprises* – measured as unexpected changes in macroeconomic forecasts around unemployment rate announcements. Their approach allows them to purge the information effects of monetary policy shocks and construct a new time series of "purified" shocks.

Miguel is also a co-author on a joint project with me where we identify the response of aggregate variables to information provision surprises and build a quantitative framework to model and measure the aggregate effects of these shocks in the economy. We show in our model that the inherent properties of the environment significantly affects the response of aggregate variables to information provision shocks. For instance, new evidence from RCTs show that firms in Italy and New Zealand have opposite reactions to an exogenous increase in their inflation expectations (Coibion and Gorodnichenko, 2018). We show these responses are consistent with the optimal information acquisition strategies of rationally inattentive firms. These firms do not choose information sets that allow them to perfectly identify sources of shocks. Accordingly, firms that operate in supply driven economies, attribute higher inflation to negative supply shocks and fire employees. On the other hand, firms that operate in demand driven economies consider higher inflation to be a sign of positive demand shocks and hire more employees. It has been a delight to work with Miguel on this project and he has been instrumental to the development of this paper.

Finally, Miguel has two additional papers in his portfolio. The first one is with a graduate student at Harvard and studies the Regressive nature of the U.S. Tariff code. In this paper, Miguel and his co-author document that tariff rates tend to be higher on lower-cost versions of similar goods. This obviously has significant implications for policies that involve tariffs since consumers sort differently across these different versions which is the focus of their model in understanding the aggregate effects of such policies. The second paper, which is joint with Andreas Mueller, Emi Nakamura and Jon Steinsson, is about the macroeconomic effects of unemployment insurance and uses a discontinuity approach to identify these effects.

All in all, I find Miguel's research organized, important and relevant to the current state of the

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literature and I believe he will benefit strongly from this Boot Camp. I recommend him in the strongest terms and with no reservations.

Sincerely,



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