MIGUEL FARIA-E-CASTRO
http://www.fariaecastro.net
miguel.castro@nyu.edu

NEW YORK UNIVERSITY

Address	19 West Fourth St., 6th Floor New York, NY 10012-1119
Phone	(+1) 347-369-8593 (cell) (+1) 212-998-3723 (office)

Placement Director: Alberto Bisin	alberto.bisin@nyu.edu	212-998-8916
Graduate Administrator: Marjorie Lesser	marjorie.lesser@nyu.edu	212-998-8923

Education

Ph.D. in Economics, New York University, 2011-2017 (expected)
Thesis Title: *Essays in Fiscal Policy and Financial Stability*.
M.Res. in Economics, Universidade Nova de Lisboa, 2009-2011
B.A. (Licenciatura) in Economics, Universidade Nova de Lisboa, 2006-2009
Erasmus: Universiteit Maastricht, 2008-2009

References

Professor Thomas Philippon
Dept. of Finance, NYU Stern
44 West Fourth St., Suite 9-190
New York, NY 10012-1126
212-998-0490 (office)
tphilipp@stern.nyu.edu

Professor Virgiliu Midrigan
Dept. of Economics, NYU
19 West Fourth St., 6th Floor
New York, NY 10012-1119
212-992-8081 (office)
virgiliu.midrigan@nyu.edu

Professor Jaroslav Borovička
Dept. of Economics, NYU
19 West Fourth St., 6th Floor
New York, NY 10012-1119
212-998-8963 (office)
jaroslav.borovicka@nyu.edu

Professor Thomas J. Sargent
Dept. of Economics, NYU
19 West Fourth St., 6th Floor
New York, NY 10012-1119
212-998-8900 (office)
thomas.sargent@nyu.edu

Teaching and Research Fields

Primary: Macroeconomics, Banking
Secondary: Financial Economics, International Economics

Teaching Experience

Spring 2016	Intermediate Macroeconomics (BA), NYU, TA for Prof. V. Midrigan
Fall 2015	Money and Banking (BA), NYU, TA for Prof. J. McCulloch
Spring 2015	Intermediate Macroeconomics (BA), NYU, TA for Prof. V. Midrigan
Fall 2014	Risk Management in Financial Institutions (BA and MBA), NYU Stern, TA for Prof. T. Philippon
Fall 2014	International Macroeconomics and Finance (PhD), NYU Stern, Grader for Prof. T. Philippon
Spring 2013	Macroeconomic Theory II (PhD), NYU, TA for Prof. R. Lagos and E. Schaal
Spring 2012	Advanced Macroeconomics (MBA), NYU Stern, Grader for Prof. L. Ljungqvist and T.

	Sargent
Spring 2011	Intermediate Macroeconomics (BA), Nova, TA for Prof. A. Silva
Fall 2010	Calculus II (BA), Nova, TA for Prof. S. Franco
Spring 2010	Intermediate Macroeconomics (BA), Nova, TA for Prof. A. Silva
Fall 2009	Calculus II (BA), Nova, TA for Prof. P. Xufre

Research Experience and Other Employment

Summer 2015	Banco de Portugal, Visiting Researcher
2013-2016	NYU Stern, Research Assistant for Profs. X. Gabaix, M. Maggiori, J. Stroebel, V. Acharya and T. Philippon
2010-2011	U. Nova de Lisboa, Research Assistant for Profs. S. Peralta and J. Tavares
Summer 2009	Portuguese Ministry of Economy and Trade, Research Assistant
Summer 2008	Millennium bcp Mutual Funds, Investment Analyst

Conference and Seminar Presentations (* scheduled)

2016	ASSA/AFA San Francisco, 10th Meeting of the Portuguese Economic Journal, Yale YFPS "Fighting a Financial Crisis" Conference, EconCon Princeton, University of Amsterdam, NYU, NYU Stern, Banco de Portugal*
2015	Cowles Foundation Conference on General Equilibrium and its Applications, 2nd ECB Forum on Central Banking, NYU PhD Alumni Conference, SED Warsaw, Banque de France-Cleveland Fed Conference on Endogenous Financial Networks, 9th Meeting of the Portuguese Economic Journal, Portuguese Treasury Agency (IGCP), 10th WUSTL EGSC, NYU
2014	9th WUSTL EGSC, NYU
2013	ENSAE Stats in Paris Conference, NYU (Financial Econ Workshop)

Professional Activities

Referee	American Economic Journal: Macroeconomics, Games and Economic Behavior, Economic Systems
Membership	American Economic Association, American Finance Association
Discussions	EconCon 2016 (Princeton)

Honors, Scholarships, and Fellowships

2016-2017	Dean's Dissertation Fellowship, New York University GSAS
2015	SUERF/UniCredit Universities Research Prize
2015	Participant at the 2nd ECB Forum on Central Banking
2012	Best Essay in Economic Policy, Ordem dos Economistas
2011-2016	Henry M. MacCracken Fellowship, New York University
2011	Fundação Amélia de Mello Award
2011	Saint-Gobain Glass Award
2010-2011	Graduate Scholarship, Fundação para a Ciência e Tecnologia
2009	Banco de Portugal Award
2009	Democracia & Desenvolvimento Award, President of Portugal
2008	Undergraduate Scholarship, Fundação para a Ciência e Tecnologia
2006	Deloitte Excellence Award

Publications

(i) Crosignani, M., M. Faria-e-Castro, and L. Fonseca (2015), *The Portuguese Banking Sector during the Sovereign Debt Crisis*, Banco de Portugal Economic Studies 1(2)

(ii) Faria-e-Castro, M, and J. Zambujal-Oliveira (2011), *Mapping a country's competitive position: a real exchange rate approach*, Studies in Economics and Finance 28(3)

Research Papers

Fiscal Multipliers and Financial Crises (Job Market Paper)

What is the impact of an extra dollar of government spending during a financial crisis? How important was fiscal policy during the Great Recession? I develop a macroeconomic model of fiscal policy with a financial sector that allows me to study the effects of fiscal policy tools such as government purchases and transfers, as well as of financial sector interventions such as bank recapitalizations and credit guarantees. Solving the model with nonlinear methods allows me to show how the linkages between household and bank balance sheets generate new channels through which fiscal policy can stimulate the economy, and study the state dependent effects of fiscal policy. I combine the model with data on the fiscal policy response to assess its role during the financial crisis and Great Recession. My main findings are that: (i) the fall in consumption would had been 1/3 worse in the absence of fiscal interventions; (ii) transfers to households and bank recapitalizations yielded the largest fiscal multipliers; and (iii) bank recapitalizations were closest to generating a Pareto improvement.

Runs versus Lemons: Information Disclosure and Fiscal Capacity
(with Joseba Martinez and Thomas Philippon, accepted at the *Review of Economic Studies*)

We characterize the optimal use of information disclosure and fiscal backstops during financial crises. In our model, financial crises force governments to choose between runs and lemons. Revealing information about banks' assets reduces adverse selection in credit markets, but it can also create inefficient runs on weak banks. A fiscal backstop mitigates this risk and allows the government to pursue a high disclosure strategy. A government with a strong fiscal position is more likely to run informative stress tests than a government with a weak fiscal position. As a result, such a government is also less likely to rely on outright bailouts.

The (unintended?) consequences of the largest liquidity injection ever
(with Matteo Crosignani and Luis Fonseca, submitted)

We study the design of lender of last resort interventions and show that the provision of long-term liquidity incentivizes purchases of high-yield securities of shorter maturities by banks. Using a unique dataset on security-level holdings, we find that the European Central Bank (ECB) three-year Long-Term Refinancing Operation incentivized Portuguese banks to purchase short-term domestic government bonds that could then be pledged to obtain central bank liquidity. The impact of this "collateral trade" is large, as banks purchased short-term bonds equivalent to 8.4% of amount outstanding. The resumption of public debt issuance is consistent with a strategic reaction of the sovereign debt agency to the consequent yield curve steepening, a possibly not unintended consequence of the intervention.

A note on information disclosure and adverse selection
(with Joseba Martinez and Thomas Philippon)

We analyze public disclosure in a financial market with private information as in Myers and Majluf (1984). Firms need outside financing to invest in valuable projects but they are privately informed about the quality of their assets. Adverse selection in credit markets can then lead to suboptimal investment. We characterize a set of policies that robustly increase investment.

Risk Incentives in an Interbank Network

I develop a model of the interbank market where financial institutions endogenously form a network of bilateral debt contracts as a response to idiosyncratic liquidity shocks. Counterparty risk and regulatory constraints interact with endowment heterogeneity to generate interest rate dispersion and differing roles in the trading process, such as intermediation. The interbank market allows for socially desirable liquidity transfers, but limited liability may generate perverse incentives that increase risk-taking. These interact with the network structure to generate bank herding and endogenously magnifying aggregate risk. The endogenous nature of the network allows for the analysis of passive (regulatory) and active (interventionist) policies. Numerical simulations suggest that regulatory policies have perverse effects that tend to amplify risk, while interventions are more effective at containing the emergence of systemic risk and the propagation of shocks. No commitment problems arise with banking sector bailouts: by committing to bailout, the authority endogenously contains bank herding, and the formation of risk.

Research in Progress

The Fiscal Multiplier of Financial Sector Interventions: Evidence from U.S. States

In late 2008, the Department of Treasury spent almost $500 billion in the largest bank bailout in US history. Estimates of the impact of the bailout in macroeconomic outcomes have remained elusive. I take advantage of the differential exposure of US states and regions to the different bailout programs to compute open economy relative multipliers in the spirit of Nakamura and Steinsson (2014). I combine data on US Treasury transactions under the Troubled Asset Relief Program with granular bank regulatory data and geographical lending exposure of US financial institutions to construct a measure of bailout exposure at the state and MSA level. To circumvent the downwards OLS bias caused by endogenous fiscal treatments highlighted by Chodorow-Reich et al. (2012), I adopt an instrumental variables approach. My procedure allows me to compute both impact and long-run yearly multipliers. I find that the TARP had a positive impact on output. Furthermore, states with greater exposure to the TARP experienced both higher delinquency rates and more pronounced debt deleveraging. These results suggest that bank recapitalizations may help to speed up private sector debt deleveraging while mitigating the output losses that are usually associated with this process.

Contingent Liabilities and Fiscal Risk Management

Research Statement

Miguel Faria-e-Castro
New York University
miguel.castro@nyu.edu

I am a macroeconomist and financial economist. My primary research interests lie at the intersection of macroeconomics, banking, and fiscal policy. The overarching theme of my research is the role played by government policies during financial crises, with special emphasis on how these policies affect financial stability and what their broader implications are for the macroeconomy.

Fiscal Policy during Financial Crises

My job market paper, "*Fiscal Multipliers and Financial Crises*" (Faria-e-Castro, 2016) studies the role of different types of discretionary fiscal policy during financial crises. The paper investigates not only traditional fiscal policy, such as government spending and transfers to households, but also financial sector interventions such as bank recapitalizations and credit guarantees in a single, unified framework. I develop a model that allows for a rich set of interactions between financial and household sector balance sheets, and use it to assess the role of fiscal policy in the U.S. during the recent financial crisis and subsequent Great Recession. Using a comprehensive dataset on discretionary fiscal policy measures, I apply a particle filter to the calibrated model in order to estimate sequences of structural shocks that allow me to study counterfactuals. I find that fiscal policy was very important - the fall in consumption would had been at least 30% worse if the government had not acted. I find that social transfers and bank recapitalizations were the most important fiscal policy programs.

In other work, "*Runs versus Lemons: Information Disclosure and Fiscal capacity*" (Faria-e-Castro, Martinez, and Philippon, 2015) with Joseba Martinez and Thomas Philippon, we study the interaction between fiscal interventions such as the ones described above, and policies that involve disclosing information on the state of the financial sector, such as stress tests. Our work is motivated by the stark difference in policy responses on the two sides of the Atlantic: while policy institutions in the U.S. responded to the financial crisis by promptly running extremely credible stress tests, and revealing information regarding the health of its systemic financial institutions, their European counterparts conducted much less aggressive information disclosure policies. Using a theoretical model, we study the incentives of a benevolent authority to reveal information about the financial sector given uncertainty regarding the state of the financial system, and how these interact with the authority's fiscal ability to intervene in case of a crisis. The title of the paper illustrates the main trade-off of information disclosure: by revealing more information regarding individual financial institutions, the authority can help "clean" credit markets from adverse selection and boost productive investment. However, by doing so, the authority may reveal the identity of weaker institutions and subject them to runs, which involves socially costly liquidation. The key result of the paper is the comparative static of the quantity of information that is revealed with respect to fiscal capacity, which is increasing. An additional interesting result

is the "paradox of fiscal capacity": when the authority can offer credit guarantees, more fiscal capacity can result in more information being revealed *ex-ante* and, thus, in less fiscal resources being devoted to these guarantees.

Monetary Policy during Financial Crises

In joint work with Matteo Crosignani and Luís Fonseca, "*The (Unintended?) Consequences of the Largest Liquidity Injection Ever*" (Crosignani, Faria-e-Castro, and Fonseca, 2016), I analyze the impact of a particular instance of unconventional monetary policy conducted by the European Central Bank (ECB) on the portfolio choice of Portuguese banks. In 2011, the ECB launched a one trillion euro liquidity provision program (over 1.3 trillion USD at the time), the Long-Term Refinancing Operations (LTRO), through which eurozone banks could borrow as much as they wanted at very low interest rates and a maturity of three years, provided they had enough collateral. The stated objective of this program was to alleviate bank funding stress, and restore the flow of credit to the real economy. Using granular data on balance sheet and portfolio holdings of domestic sovereign debt for banks in Portugal, a country under extreme sovereign stress at the time, we show that the announcement of this operation caused banks to purchase more sovereign debt. We find that these purchases were tilted towards shorter-term debt, and argue that this is optimal from a liquidity risk management perspective. We quantify these effects and find that they are economically large, with Portuguese banks expanding their demand for short-term sovereign debt by almost 10% of total amounts outstanding. We argue that the behavior of the yield curve, and the strategic response of the Portuguese Treasury are consistent with the phenomenon we describe. In the following months, the ECB announced a series of other unconventional policies that had a significant stabilizing impact on sovereign yields. We argue that these later policies, together with the causal increase in purchases at the LTRO, effectively constituted a stealth recapitalization of the Portuguese banking system, and quantify this effect.

Future Work: Contingent Liabilities and Fiscal Risk Management

I look forward to continuing my research on the interaction between public policies and financial stability. I am particularly interested in government credit programs and public contingent liabilities. The recent Financial Crisis has highlighted the importance of these issues, as sovereigns such as Ireland or Spain became distressed due to guarantee programs that were extended to the financial sector. Furthermore, Central Banks responded to the financial crisis by acquiring large portfolios of private assets, and it is yet not clear what is the best way to "normalize" the conduct of monetary policy (or if this normalization is even desirable). In particular, some authors have argued for the analysis of government programs through the lens of corporate finance and asset pricing (Lucas, 2016; Hanson, Scharfstein, and Sunderam, 2016). I am interested in extending their work and analyzing the role of public asset and liability portfolios under the lens of macroeconomic, general equilibrium models. The macroeconomic impact of most contingent liabilities operates through precautionary motives (i.e. credit guarantee or lender-of-last-resort programs).

For that reason, the analysis of this type of programs in dynamic, stochastic general equilibrium models is challenging, as it requires the use of solution methods that account for this type of nonlinearities. I believe that there are several interesting questions regarding the effectiveness of government financial policy on the economy that have not been answered yet due to these technical limitations.

References

Crosignani, M., M. Faria-e-Castro, and L. Fonseca (2016): "The (unintended?) consequences of the largest liquidity injection ever," Unpublished, New York University and London Business School.

Faria-e-Castro, M. (2016): "Fiscal Multipliers and Financial Crises," Unpublished, New York University.

Faria-e-Castro, M., J. Martinez, and T. Philippon (2015): "Runs versus Lemons: Information Disclosure and Fiscal Capacity," Working Paper 21201, National Bureau of Economic Research.

Hanson, S. G., D. S. Scharfstein, and A. Sunderam (2016): "Fiscal Risk and the Portfolio of Government Programs," Working Paper 22763, National Bureau of Economic Research.

Lucas, D. (2016): "Credit Policy as Fiscal Policy," *Brookings Papers on Economic Activity*, 52, 1–57.

New York University
A private university in the public service

Arts and Science
Department of Economics
19 West Fourth Street, 6th Floor
New York, NY 10012-1119
Telephone: (212) 998-8900
FAX: (212) 995-4186

Jaroslav Borovička
Assistant Professor
Department of Economics
New York University
jaroslav.borovicka@nyu.edu
phone: +1-(212)-998-8963

November 15, 2016

Letter of recommendation for Miguel Faria-e-Castro

Dear colleagues,

It is my pleasure to highly recommend Miguel Faria-e-Castro for a position at your department. Miguel is a macroeconomist and financial economist broadly interested in the role of financial intermediaries in the macroeconomy. His work shows a very wide range of skills, from purely theoretical, over quantitative and computational, to empirical work and policy questions. Any economics and finance department, including the top ones, should consider him seriously.

In his job market paper, titled "**Fiscal Multipliers and Financial Crises**", Miguel studies the efficacy of alternative fiscal policies in a nonlinear dynamic equilibrium model populated by multiple relevant frictions. The main question is a quantitative one: Which of these policies generated the largest bang for the buck during the Great Recession, which constraints did these policies relax, and how did alternative policies interact with each other?

Existing work on the analysis of fiscal multipliers for alternative policies has largely focused on simplified environments designed to study these policies in isolation. The Great Recession, however, witnessed the introduction of a whole spectrum of policy actions, ranging from fiscal transfers across households and additional government spending to explicit or implicit government bailouts of the financial sector. Understanding the interaction between these alternative policies in a structural model is crucial for the evaluation of the impact of these policies on the economy.

In order to achieve this goal, Miguel first collects a dataset of expenditures on fiscal and quasi-fiscal policies during the Great Depression, including implicit guarantees provided to the financial sector. These data motivate him to construct a model that features the main benefactors of these policies in the economy and crucial frictions these agents face.

Specifically, the household sector features heterogenous saver and borrower households where the borrower households invest into housing using defaultable mortgages. Borrowers' spending is occasionally constrained when the value of housing declines substantially. This choice is motivated by the work of Mian and Sufi (2014) and others, who emphasize the role of indebted households and the housing sector during the Great Recession. Funds between

borrower and saver households are channeled through a financial sector that is subject to an occasionally binding financing constraint and faces maturity mismatch risk since it finances long-term mortgages with short-term deposits. Finally, the production sector is subject to nominal frictions and exposed to standard TFP shocks.

Miguel is interested in studying the dynamics of the economy during financial crises, which are modeled as persistent increases in the idiosyncratic risk of the borrower households. This increase in idiosyncratic risk leads to higher mortgage default rates, which in turn generates capital losses in the financial sector. When these capital losses are sufficiently large, banks start defaulting, which decreases the value of deposits and further erodes bank capital. This financial accelerator mechanism is highly state-dependent and leads to a nonlinear interaction between the borrowing constraints of households and the financing constraints of financial intermediaries.

In this environment, Miguel investigates four different types of fiscal policies: direct government spending, fiscal transfers between saver and borrower households, equity injections and transfers to the financial sector, and provided credit and asset guarantees. Using macroeconomic and financial data and collected data on these fiscal policies, he infers the trajectory of underlying shocks and endogenous state variables, and studies the impact of these policies during the Great Recession.

Overall, the paper constitutes a substantial piece of quantitative work that speaks to several literatures focused on the analysis of the Great Recession. In terms of the response of aggregate consumption in Miguel's model, fiscal transfers from savers to borrowers had the largest effect during the Great Recession, providing a justification for the importance of models with heterogeneity in tightness of household borrowing constraints (Kaplan and Violante (2016) and others). The model also shows how bank recapitalizations benefited both savers (owners of the banks) as well as borrowers (through increased borrowing), although the response of aggregate consumption to these policies has been more modest (providing a quantitatively robust support for the results in Bianchi (2016) and related papers). At the same time, the corresponding fiscal multipliers can easily turn negative during normal times.

While the individual channels studied in the paper are not novel, Miguel's contribution lies in his ability to combine multiple frictions in one model that he can solve fully nonlinearly, so that analyzed policies can be compared side-by-side. Most of the literature studies these policies in isolation, while ignoring the contribution of other simultaneously executed actions during the Great Recession. Given the nonlinearities in the model, impact of individual policies is not simply additive. For example, Miguel shows how transfer policies alone can improve the balance sheets of borrower households and reduce their defaults, thus improving capital adequacy within the financial sector without direct policies targeted at financial intermediaries.

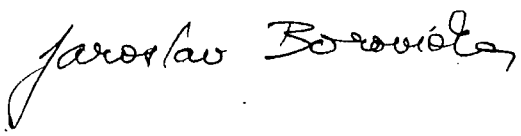
Incorporating multiple sectors and alternative frictions that are quantitatively relevant for the studied policies requires careful considerations in modeling choices, and experience and good judgement in trading off tractability and transparency with empirical validity. Miguel undoubtedly possesses all these capabilities. At the same time, the whole project

documents Miguel's general interests. He is interested in theoretical macroeconomic problems that have empirical and policy relevance, and can speak to a broad audience. This is also reflected in his other work, focused more directly on financial intermediation. His joint work with Joseba Martinez and Thomas Philippon, "**Runs versus Lemons: Information Disclosure and Fiscal Capacity**" is conditionally accepted in the Review of Economic Studies. I am sure Thomas will write more about the paper in his letter but I would like to mention that this paper also shows Miguel's interest in theoretical work. On the other hand, "**The (Unintended?) Consequences of the Largest Liquidity Injection Ever**" is more empirically oriented and documents his empirical and policy interests as well.

This year, I am writing letters for two of our best students, the other being Callum Jones. Miguel and Callum both belong to the select group of our top macro students that our department produced over the recent years, although they are quite different and hence hard to compare. With Miguel, you will be hiring an active, lively colleague who can speak to a broad range of colleagues from macroeconomics, across finance to theory. He has been an active participant and organizer of students' academic activities, has a deep knowledge of economic modeling, as well as a superb overview of policy-relevant problems. I can recommend him highly and without reservations.

Please do not hesitate to contact me if you have any further questions.

Jaroslav Borovička



New York University
A private university in the public service

Faculty of Arts and Science
Department of Economics
19 West 4th Street, 6th Floor
New York, NY 10012-9873
Telephone: (212) 998-8900
FAX: (212) 995-4186

November 14 2016

To Whom It May Concern

This is an enthusiastic letter of recommendation for **Miguel Faria-e-Castro**, an Economics graduate student at NYU.

We are very lucky at NYU this year to have several impressive macro students on the market. I am writing letters for three of them: Callum Jones and Simon Mongey, in addition to Miguel. All three of them are excellent and should do very well on the job market. It is difficult for me to rank them: they all work on very different topics and have very different skills, but I can confidently say that all three of them are among the best of the students we have produced in the past 10 years. I recommend that all departments, including the very top, take a look at all three of them.

Miguel's research has focused on studying the interaction between financial markets and macroeconomic outcomes. He has produces several papers, studying risk-taking in interbank networks, adverse selection and bank runs in financial markets, and the interaction between fiscal policies and the state of financial markets. One of the papers, joint with Thomas Philippon and Joseba Martinez, a classmate of his at NYU, has been accepted for publication in the *Review of Economic Studies*. His job market paper, entitled "Fiscal Multipliers and Financial Crises," is very impressive as well. Let me describe it next.

His job market paper is motivated by the large interventions of U.S. and other countries' governments in the aftermath of the Great Recession. The U.S. government, for example, has used a combination of public purchases, social transfers and tax rebates (the ARRA stimulus package), as well as unprecedented interventions in the financial sector (TARP). The goal of Miguel's work is to evaluate the effect these interventions have had on macroeconomic and financial outcomes. This is an important question, one that has received much attention in policy discussions. For example, Mian and Sufi have argued in their book that the U.S. government has devoted too many resources to supporting the financial sector at the onset of the crisis, thus leaving indebted homeowners to bear the brunt of its adverse consequences. Others, for example Timothy Geithner, would disagree, arguing that the financial sector plays a critical role in intermediating resources and that financial sector interventions prevented a sharper decline in household leverage and spending.

Miguel's job market paper develops a framework that can be used to tackle questions that are at the center of these debates. Though a number of papers have studied individual government interventions in isolation (for example the literature on the size of government spending multipliers), Miguel's starting point is the recognition that such policies have non-linear and state-dependent effects and therefore cannot be examined in isolation. As is well known from, for

example, work by Larry Christiano, Martin Eichenbaum and Sergio Rebelo, the size of spending multipliers critically depends on the state of the economy at any point in time. Because policies have non-linear effects, they cannot be studied in isolation, or using the typical toolkit of modern macro – log-linearized models. Miguel's contribution is therefore to develop a non-linear model with a financial sector, feed the model data on the size of various government interventions, and evaluate their effects, jointly and in isolation. His punch line is that the combined effects of all interventions was to reduce the drop in consumption by about one-third, and that direct transfers to households (e.g. tax rebates) have had the largest impact.

Let me now describe his model in some detail. The model assumes two types of households who differ in their preferences, leading them to either save or borrow through a financial intermediary (bank) that is subject to occasionally binding leverage constraints. Households can default, as can financial intermediaries. Such choices have implications for the balance sheets of the other agents and, due to price rigidities and imperfectly responsive monetary policy, can have adverse consequences for output and employment. A fiscal authority can relax household and bank debt constraints, either through direct transfers to households, or by direct intervention in the financial sector via bank recapitalizations or credit guarantees. The latter effectively subsidize bank borrowing. Households are subject to idiosyncratic shocks to the value (quality) of their houses: those agents whose housing values fall the most find it optimal to default on their mortgage debt. Similarly, banks hold imperfectly diversified portfolios of mortgage-backed securities and are therefore subject to idiosyncratic shocks to the value of the assets they hold: those subject to the most severe shocks choose to default.

Miguel considers two aggregate shocks: one to total factor productivity, as well as a mean-preserving spread in the quality of the housing stock owned by households. The TFP shocks has fairly standard effects, though here it also raises the value of bank assets, reduces lending spreads and the households' default probabilities, thus amplifying the effects on output through the financial accelerator channel. Most importantly, the spread to the quality of households' housing raises the households' rates of default, worsens the bank's balance sheets and thus raises credit spreads and bank default probabilities. This in turn reduces banks' ability to lend to households, causing a further reduction in the value of their housing, leading to further default and household deleveraging. The model thus captures, in a parsimonious way, the key channels that have been proposed to explain the sharp drop in output and employment in the Great Recession. Importantly, these shocks lead the economy to enter into a highly non-linear region of the state-space in which output, bank and household balance sheets are much more sensitive to aggregate shocks as well as to various forms of government intervention.

Miguel solves the model using non-linear projection methods, by approximating equilibrium objects using spline interpolation and time iteration. He then assembles a comprehensive dataset that summarizes the various discretionary policy interventions (those that are in addition to the automatic stabilizers that are triggered in recessions) of the U.S. government during the Great Recession (TARP, the Obama and Bush tax rebates and stimulus acts) and maps each of these into the four fiscal policy tools available to the policymaker in his model. He uses a particle filter in order to uncover the aggregate shocks that allow the model to match the path for consumption and credit spreads in the data. He then uses the model as a laboratory to studying the effect of various

government interventions, but turning them on and off and studying the effects of doing so on macroeconomic aggregates.

His analysis uncovers a number of interesting conclusions. First, government purchases have had a negative impact on consumption overall: in their absence the decline in household consumption would have been smaller. The government spending multiplier is thus less than one. Second, equity injections into the banking sector and credit guarantees, though fairly large in size, have had fairly minor impact on consumption and thus output. Finally, direct transfers to households have had the largest effect. Absent these interventions, the drop in consumption would have been 50% greater than the actual drop observed in the data. Importantly, these conclusions critically hinge on the state of the U.S. economy as of 2007: the same set of government policies would have had a negligible, in fact, negative impact had they been applied in, say, 2000, a period in which bank and household balance sheets were much healthier.

To sum up, I think very highly of Miguel and his work. He is extremely thorough and careful with his modeling, computations and empirics. He cares greatly about the institutional details of the markets he studies, and in this sense reminds me of Thomas Philippon. He is also a skilled modeler and has excellent technical skills, at the level of the best job market candidates we have interviewed and flown out at NYU in recent years. He has great upside potential and I very enthusiastically recommend that you take a close look at his work.

Virgiliu Midrigan



Professor of Economics
New York University

(212) 992 8081
vm50@nyu.edu

NEW YORK UNIVERSITY
NYU STERN
LEONARD N. STERN
SCHOOL OF BUSINESS

THOMAS PHILIPPON
Professor of Finance
tphilipp@stern.nyu.edu

HENRY KAUFMAN MANAGEMENT CENTER
44 WEST 4TH STREET, SUITE 9-190
NEW YORK, NEW YORK 10012-1126
TEL: 212-998-0490
FAX: 212-995-4220

November 15, 2016

To Whom It May Concern,

I am pleased to write on behalf of **Miguel de Faria e Castro**. Miguel is a Ph.D. student in the Economics department who studies macroeconomics, with a particular emphasis on banking and fiscal policy.

I know Miguel very well: he has been my RA, the TA for three of my classes, and, more importantly, we have worked together as co-authors (with J. Martinez) on a paper that studies the design and disclosure of banking stress tests when governments have limited fiscal resources. This paper is now forthcoming in the *Review of Economic Studies*. Miguel, Joseba, and I study the trade-off between "runs and lemons", i.e, Akerlof vs Diamond-Dybvig. In this context, information disclosure has ambiguous effects on welfare. On the one hand, providing information about banks' balance sheets reduces adverse selection in credit markets. On the other hand, it can create inefficient runs on weak banks. A fiscal backstop mitigates the risk of runs and allows the government to pursue a high disclosure strategy. We can then show, by extending the approach of Kamenica and Gentzkow, that a government with a strong fiscal position is more likely to run informative stress tests than a government with a weak fiscal position. In addition, such a government is less likely to rely on other forms of bailouts (credit guarantees, for instance). We show that a "paradox of fiscal capacity" can happen, where governments with *more* fiscal slack ends up spending *less* on bailouts (because they disclose more aggressively). Miguel and Joseba were absolutely integral to the project, and I learned as much from them as they did from me. For instance, they figured out how to use the tools in

Kamenica-Gentzkow to solve our problem (it's not trivial; it requires building the convex hull in the right way and dealing with endogenous runs and investment).

In his job market paper, Miguel tackles an important question in macro/finance: how should a government allocate its limited fiscal capacity between counter-cyclical macro policies and policies to stabilize the financial system?

This is an important question, both in practice and in theory. In practice, bailouts are often a major outlay during crises. The governments of Spain and Ireland became nearly insolvent after trying to rescue their banks. The theoretical question is also interesting, for at least three reasons. First, the answer is not obvious at all, because, presumably, the same macro forces that create large spending multipliers are also likely to create large bailout multipliers. Second, general equilibrium effects create connections between the two interventions. For instance, counter-cyclical policies that increase employment can decrease the risk of default by indebted households. Reciprocally, credit subsidies to banks can increase investment and output. And, finally, all these effects are non-linear and require a global approach to estimate state-contingent multipliers.

Miguel tackles all these issues in his job market paper; this is an impressive achievement. First, he builds a model that captures household credit risk, bank's default risk, and fiscal policy interventions in terms of social transfers and bailouts. Second, he constructs a dataset to measure the main interventions during and after the financial crisis (economic stimulus, TARP, recovery and reinvestment act, etc.). Third, he uses the model to estimate the contribution of various policies to the stabilization of the economy. Along the way, he displays his technical skills to solve and estimate a rich, non-linear model. For instance, the extent to which borrowers behave in non-Ricardian way depends on the state of the economy.

Miguel finds that, without fiscal policy, consumption would have dropped by a third more than it did. Among the various programs, he finds that social transfers and bank recapitalizations played the larger role. There are interesting differences between the two, however. Transfers act as redistribution from savers to borrowers. Bank recapitalization, on the other hand, help borrowers because they improve access to credit, but also savers who are banks' shareholders.

Another striking result that Miguel uncovers is that transfer multipliers are a lot more state-contingent than purchase multipliers. Government purchase multipliers are typically close to one. Transfer multipliers, however, can be as low as 0.2 in good times, but they range from 1.5 to 2 for moderate transfers in crisis times.

Miguel's job market paper makes an important contribution to our understanding of financial crises and fiscal policy, and I have no doubt it will be highly cited.

Miguel is one of the very best and brightest students I have seen at NYU in recent years. He is quick, focused, and hard-working; he moves seamlessly between theory, empirical work, and quantitative methods. I can recommend him enthusiastically to all Economics departments and business schools. Please contact me if you need additional information.

Best Regards,

Thomas Philippon

