Ruhollah Eskandari

CONTACT INFORMATION

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EDUCATION

PhD Economics, University of Milan, Italy, December 2015
Thesis: *Essays in Tax Policy, Macroeconomics and Corporate Policies*
Advisors: *Roberto Perotti, Valerie A. Ramey and Emanuele Bacchiocchi*

Visiting PhD Student, Università Bocconi, Italy, March 2015-December 2015
Visiting PhD Student, University of California, San Diego, March 2014-Feb 2015

MPhil Economics, Universitat Autònoma de Barcelona, Spain, 2011
MSc Economics, Sharif University of Technology, Tehran, Iran, 2007
BSc Economics, Allameh Tabatabaee University, Tehran, Iran, 2005

RESEARCH INTERESTS

Primary Fields: Macroeconomics, Fiscal and Monetary Policy and Financial Macro
Secondary Fields: Time-Series Econometrics and Corporate Finance

WORKING PAPERS

"Tax Policy and Investment Behavior of Small and Large Firms", with Morteza Zamanian, [JMP]

"State-Dependent Macroeconomic Effects of Tax Changes: Estimates Based on Narrative Records"

"Long-Run Dynamics and Short-Run Variations of U.S. Corporate Cash Holding", with Morteza Zamanian, submitted (JMCB).

"The Impact of Uncertainty on Real and Financial Activities of U.S Firms", with Emanuele Bacchiocchi.

"A Comment and Extension on Gertler and Gilchrist (1994-QJE) and Chari, Christiano and Kehoe (2013)"

RESEARCH IN PROGRESS

"The Impact of Fiscal Austerity on the Investment and Financial Decisions of European Firms". This paper seeks to contribute to the empirical literature on fiscal policy by investigating the effect of fiscal austerity on the investment and financial decisions of firms of different sizes for a large number of OECD countries.

"Monetary Policy, Financing Constraints and Investment Behavior of Small and Large Manufacturing Firms"

TEACHING EXPERIENCE

PhD: Time-Series Econometrics (Uni of Milano-Bicocca), Advanced Macroeconomics (Uni of Milan)

Master: Money and Finance (Uni of Milan), Principles of Finance (Bocconi)

Undergrad: Risk Management (Bocconi), Econometrics (Uni of Milan)

PROFESSIONAL EXPERIENCE

Teaching and Research Assistant, Università Bocconi, Italy, 2015-present

Research Assistant, Institut d'Anàlisi Econòmica (IAE), CSIC, Barcelona, Spain, 2010-2011

Research Assistant, Institute for International Energy Studies (IIES), Tehran, Iran, 2007-2009

FELLOWSHIPS AND AWARDS

PhD Scholarship, Università di Milano, Italy, 2011-2014

Scholarship PIF, Universitat Autònoma de Barcelona, Spain, 2009-2011

PRESENTATION

The Institute for Management and Planning Studies (IMPS), Fall 2016

University of York, Spring 2016

University of Cambridge, Winter 2016

European Winter Meeting of the Econometric Society, Milan, December 2015

Padova Macro Talks, July 2015

University of California, San Diego, Macroeconomics Seminar, Fall 2014

WEEE, Bank of Italy, Perugia, Italy, Summer 2013

REFEREE

Bulletin of Economic Research, Spring Meeting of Young Economists (SMYE) 2017

SOFTWARE

MatLab, Stata, Dynare, EViews, Rats, Microfit, Gretl, LaTeX, and basic HTML

LANGUAGES

English (fluent), Farsi (native), Turkish (native), Arabic, Italian

DATA COLLECTION

US Census Bureau, Quarterly Financial Report (QFR), is a semi-aggregate statistics from US manufacturing firms. QFR data is classified by 8 asset size categories and reports income statement and balance sheet data. Long period coverage at quarterly frequencies since 1955 and including both small private firms and large publicly traded firms makes QFR unique compared to other standard data-sets like *Compustat*, which is restricted to publicly traded firms. These advantages of QFR allows one to analyze small businesses behavior and shed light on the role of financial frictions as such firms are more prone to such frictions. However, prior to 1988, the data was only available in hard copies. We extended the data back to 1956Q1 by collecting data from various issues of the QFR books and microfiches. The data are constructed using a simple version of the procedure applied in Gertler and Gilchrist (1994).

OLDER PAPERS

"Causality in the Mean and Variance between Crude Oil and Refined Products Prices in the US and European Markets", IIES Working paper, September 2010, with Ahmad R. Jalali-Naini

"Cyclical Effects of Fiscal Shocks to Government Consumption, Investment and Public Welfare", MPhil thesis.

REFERENCES

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Research Proposal:

Heterogeneous Effects of Fiscal Consolidation on Firms' Balance Sheets

Ruhollah Eskandari
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1 Introduction

The Great Recession of 2007 – 2009 has led to a pronounced increase in public debt. In many advanced economies public debt has increased on average from 70 percent of GDP in 2007 to about 100 percent of GDP in 2011 which is the highest level after the post-World War II period[1]. The crisis came largely due to the expansionary increase in government spending to stave off a Great Depression and partly due to the collapse in tax revenues as incomes fell. The global financial crisis and slow ensuing recovery have put severe strains on the fiscal positions of many OECD countries, raising serious concerns about fiscal sustainability, especially in the Euro Area. The challenge facing these countries is how to bring debt down to safer levels in the face of a weak recovery. Several EU governments undertook large fiscal consolidations plans that involved a combination of spending cuts and tax hikes, aiming at sustainably reducing public deficits and debt. From 2011 to 2013, fiscal policy in the euro area turned progressively more restrictive.

The design of fiscal adjustments and its output effect – The effects of fiscal consolidation on output and unemployment have been extensively investigated in the literature. Giavazzi and Pagano (1990), Alesina and Perotti (1997), Alesina and Ardagna (2010, 2013), Guajardo et al. (2015), Alesina, Favero and Giavazzi (2015) and Alesina et al. (2015), among others, find that fiscal adjustments based upon spending cuts are much less costly in terms of output losses than tax-based ones, and that adjustments that rely primarily on tax hikes do not lead to a permanent consolidation of government finances. However, existing empirical studies have focused on aggregate level data and have failed to consider the heterogeneous effects that fiscal consolidation might have on the economic performance

[1] IMF Fiscal Monitor, April, 2012.

of the business sector. This omission, due in large part to the scarcity of firm-level data capturing how firm's assets and liabilities are affected by fiscal consolidation, restricts our knowledge about how fiscal adjustments impacts economic performance. Moreover, the endogeneity of tax policy makes it very hard to obtain robust estimates of the causal effect of fiscal consolidation without using disaggregated data.

Heterogeneous Effects of Fiscal Consolidation on Firms' Balance Sheets – Making use of yet unexplored detailed firm level data and a range of econometric methods, I will provide novel and robust empirical evidence on the causal impact of fiscal consolidation on the real and financial activities of different sized firms, for a large number of OECD countries. Specifically, this project will pursue the following research objectives to explore the heterogeneous effects of fiscal consolidation on firms' balance sheets:

1. What is the causal effect of fiscal consolidation on firms' performance?

2. Does the composition of fiscal consolidation (spending versus taxes-based) matters for firms?

3. How differently do small and large firms respond to fiscal consolidation?

4. Are the effects of fiscal consolidation on real (Investment, Sales and Employment) and financial (Debt, Cash-holding, Dividend and Equity) activities heterogeneous across firms?

I will highlight the important role of financial frictions in determining the impact of fiscal adjustment on firms' performance. Because these financial frictions affect differently firms of different size, the effects of fiscal consolidation are likely to be heterogeneous across firms. However, small firms' response to policy changes is the missing aspect in the existing empirical literature of corporate finance which mainly relies on datasets of publically traded corporations. By making use of CompNet data which covers all corporations in the euro area including private and small firms, this research will make major strides to unveil how small and large firms may respond differently to large economic shocks such as the fiscal consolidation plans that were implemented in the EU following the Great Recession.

2 Research methodology and approach

Data: we will use the European Central Bank Competitiveness Research Network (CompNet) database for 17 EU countries. CompNet includes information for 56 industries, both manufacturing and services, over the period 1995-2012. Specifically, we will use the "CompNet indicators" aggregated to the industry or country level. Since we intend to evaluate the effect of fiscal austerity on both real and financial decisions of firms, all the indicators mentioned in Table 6 in the ECB Working Paper 1764, March 2015[2] with different levels of aggregation will be needed. We will use the so-called "full sample" that comprehends all the firm population including both small and large firms. One advantage of CompNet data is that it reports key balance sheet, income statement and tax items for corporations sorted in various ways, including by industry, size of total assets, size of business receipts and number of employees. More importantly, this data set contains key real and financial variables of corporations, providing enough information to explore how investment responses to policy changes affect other real and financial policies of firms of different sizes. Moreover, CompNet data benefits from large number of observations by covers all corporations in the euro area including private and small firms. Small firms' behavior to policy changes is the missing aspect in the literature of corporate finance which mainly relies on datasets of publically traded corporation.

Identification: the main challenge in measuring the aggregate effects of fiscal policy shocks is how to identify exogenous shifts in fiscal policy. To obtain estimates of the effects of fiscal consolidation, the IMF research draws on historical accounts and records (narrative approach) of policy actions-tax hikes and spending cuts-motivated by a desire to bring about deficit reduction. This is a more accurate measure of policy actions than those used in previous studies, which often rely on the observed change in the budget deficit adjusted for the economic cycle. The use of narrative records has a long-standing tradition in macroe-

[2]P. Lopez-Garcia, F. di Mauro and the CompNet Task Force, 2015, Assessing European competitiveness: the new CompNet micro-based database. Working paper / National Bank of Belgium / Research; 279.

conomics in the estimation of the effects of fiscal and monetary policy shocks[3]. In this project, we propose to use the narratively identified exogenous shifts in the fiscal consolidation episodes, as proxies for structural shocks, collected by Devries at al. (2011) and extended by Alesina et al. (2015). The database contains information on 215 episodes of fiscal consolidation for 11 OECD economies[4] during 1978-2013. The magnitude of the fiscal consolidation episode ranges between 0.1 and about 5 percent of GDP, with an average of about 1 percent of GDP. Alesina et al. (2015) point out some of the main advantages of using the narrative approach: (i) Shocks identified by this approach are model-independent and therefore are not affected by the possible omitted variables, (ii) with the narrative approach we can distinguish between anticipated and unanticipated components of the shocks which is important to prevent the multiplier estimation biases in the presence of fiscal foresight, (iii) we can distinguish between stabilization based on permanent shifts in fiscal policy, from those based on transitory shifts.

Econometric Framework: the project also contributes to the empirical literature of fiscal policy by applying the instrumental variables (IV) methodology developed by Stock and Watson (2008, 2012) and Mertens and Ravn (2013) to estimate the impact of fiscal austerity on real and financial activities of firms of different sizes. Since fiscal adjustments are typically introduced via multi-year plans, when both spending and taxes are adjusted simultaneously, this methodology allows us to isolate the causal effects of a change in only one of the policies and therefore control for changes in the other policy. This method is more precise and accurate than labeling procedure applied in Alesina et al. (2015) in which they distinguish fiscal adjustments between those that are predominantly made of tax increases (label as tax-based) and those that are predominantly made of spending cuts (label as expenditure-based).

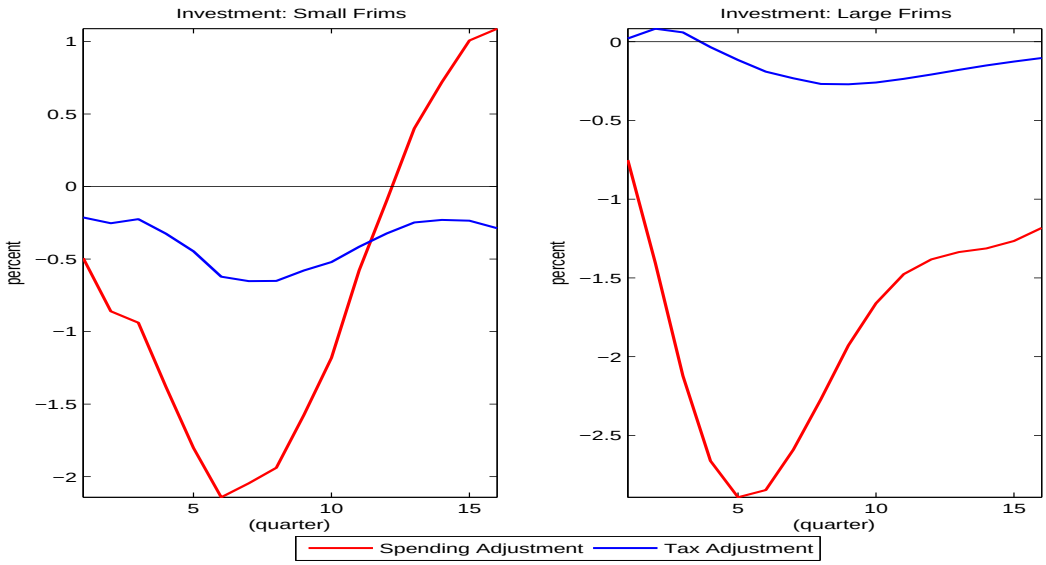
Figure 1 shows our preliminary estimated results for the effect of tax and government

[3]Ramey, Valerie A. (2016), "Macroeconomic shocks and their propagation." In Handbook of Macroeconomics Volume 2 (John B. Taylor and Harald Uhlig, eds.), Elsevier.

[4]Austria, Belgium, Denmark, Germany, France, Ireland, Italy, Portugal, Spain, United Kingdom, and United States.

spending adjustments on the investment of small and large firms for the U.S. manufacturing firms. It shows that the impact of tax adjustment is lower and significantly not different from zero, while government spending adjustment has large effect on investment for both small and large firms.

Figure 1: The Effect of Tax and Spending Adjustments on U.S. Small and Large Manufacturing Firms



As a consequence of the global financial and economic crisis government deficits have raised substantially, thus many European governments implemented sizable austerity measures in order to reduce budget deficits. A large empirical literature provides evidence of the heterogeneous nature of euro-area economies after the recent financial crisis. This research has the opportunity to make a major contribution to policy-making, macroeconomics, fiscal policy, corporate finance and macroeconometrics. Understanding the discriminate effect of policy changes on firms in different size classes might be very insightful for realizing the channels that fiscal adjustments impact the real economy. Other than novelty of this research project, its results will provide important insights into understanding how fiscal austerity plans impact different corporations heterogeneously. Particularly, it provides interesting implications and suggestions to fiscal policy administrations to design effective programs on the different class of firms. The techniques to be implemented and results acquired in the fellowship will be of widespread interest.

3 References

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November 16, 2015

To Whom It May Concern:

I am pleased to write a letter of recommendation for RUHOLLAH ESKANDARI. I first became acquainted with Ruhollah when he e-mailed me in Summer 2013 with a rough draft of a note that extended some work I had been doing. I met him a few months later when I was giving a talk at Bocconi in October 2013. Although Ruhollah is a student at the University of Milan, he was working closely with Roberto Perotti. After our meeting, Ruhollah applied to visit UCSD as a visiting graduate student. He arrived in Winter 2014 and spent the year here. I talked to him about his research frequently and he was very active in our seminars and workshops. He also met regularly with several other faculty members.

Ruhollah is a very serious researcher who has a good feel for the interesting questions in the literature. He had a very productive year at UCSD and was able to complete several papers. Ruhollah's paper "State-Dependent Macroeconomic Effects of Tax Changes: Estimates Based on Narrative Records in the U.S." merges some of the state-dependent techniques used by Auerbach and Gorodnichenko (2012, 2013) and Owyang, Ramey, Zubairy (2013) to study government spending with the tax narrative series constructed by Romer and Romer (2010) and refined by Mertens and Ravn (2013). Ruhollah investigates whether tax changes have different effects depending on whether they are enacted when the unemployment rate is high or low. Interestingly, he finds very large differences across states of the world. In particular, he finds that an exogenous tax increase lowers output significantly if the tax increase occurs during low unemployment times, but actually raises output somewhat if the tax increase occurs during high unemployment times. This result is very counter-intuitive, but it is consistent with some empirical results obtained by Auerbach and Gorodnichenko (2012) using completely different methods and identification. Ruhollah goes on to explore the source of the differences across states and finds that investment is the most important component of GDP for accounting for the differences. Ruhollah also finds that the sign of the tax change is important for the effect on output. Overall, he provides very credible empirical evidence that the effects of taxes are dependent on important nonlinearities.

Ruhollah's job market paper looks at the effect of taxes on firm investment behavior. This paper is "Tax Policy and Investment Behavior of Small and Large Firms: New Evidence from U.S. Manufacturing Data," co-authored with a graduate student at Bocconi. In essence, this paper does for tax policy what Gertler and Gilchrist (1994) did for monetary policy. The authors

use the Romer-Romer (2010) and Mertens-Ravn (2013) narrative tax series to identify exogenous, unanticipated tax shocks by firm size and then employ the Quarterly Financial Reports (QFR) to investigate the responses of investment and financing by firms categorized by firm size. While there is a significant existing literature exploring tax effects across different sizes of firms, that literature has tended to use tax changes that were not necessarily exogenous. Thus, a key contribution of this paper is the merging of the questions of the existing literature with the innovations on measuring tax shocks from the macro literature. Moreover, the present paper expands on the narrative series by distinguishing the changes to corporate tax rates by firm size. The authors find that investment rises in response to exogenous cuts in corporate tax rates, and that investment rises more for large firms than small firms. The authors then look at the behavior of various parts of the balance sheet in order to understand the financing of the investment. They find that cash holdings decline for all firms, but decline much more for large firms. Also, debt rises for all firms but it rises much more for large firms. These results are robust to a variety of controls. To explain these results, the authors introduce a dynamic stochastic partial equilibrium model in which firms hold cash for precautionary reasons against future possible credit constraints.

Ruhollah also has work in progress that explores in more detail the cash holding policies of firms by size. In this work, he and his co-author use the empirical results of the previous paper to motivate the theoretical analysis of firms' optimal cash holding behavior.

In the two years that I have known him, I have been impressed with Ruhollah's ability to come up with an idea, master the technical skills necessary to implement the idea, and write a paper that pushes the literature forward. He has a good ability to work independently initially and then to seek input to help move the project along. He is very open to incorporating suggestions from others so that as an advisor I really felt like any time I spent talking to Ruhollah about his paper was time well-spent.

All of Ruhollah's papers illustrate his creativity and skill in tackling current questions in fiscal policy and analyzing rich data suited to answering the questions. He shows every indication of continuing to come up with creative ways to answer important questions in macroeconomics. Ruhollah is also a very pleasant colleague. Just last week, several of the graduate students here mentioned to me how much they missed having him here.

In summary, I think that Ruhollah Eskandari would be an excellent hire for many departments. He would be a pleasant and engaging colleague for your department.

Sincerely,

Valerie Ramey

Valerie Ramey
Professor of Economics

Università Commerciale
Luigi Bocconi

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Re: Letter of Recommendation for **Ruhollah Eskandari**

Dear Recruiting Committee

It is with great pleasure that I take this opportunity to recommend Ruhollah to you. Ruhollah is not a student from Bocconi, in fact is a completing student on the PhD in Eocnomics awarded by a Consortium of Universities that does not include Bocconi. However, I know Ruhollah's work very well as he has been attending my PhD courses in Bocconi and I am acting as external examiner of his PhD thesis.

This thesis consists of three essays addressing the impact of tax policy changes on the macroeconomic aggregates with particular reference to the real and financial decisions of firms of different sizes.

The most interesting and innovative chapter of the thesis is the second chapter entitled "Tax Policy and Investment Behavior of Small and Large Firms" (joint with Morteza Zamanian) This paper investigates the role of size in firms' responses to exogenous tax changes over the post-WWII period. Using the US Census Bureau, Quarterly Financial Report (QFR) data and employing the local projection method proposed by Jordà, the authors find that both small and large firms respond to exogenous corporate income tax cuts by boosting investment. Very interestingly firms financing behavior show some heterogeneity. Despite the fact that small firms hold relatively more cash (cash to asset) than large firms, large firms rely more heavily on cash to finance investment generated by exogenous tax cuts. In addition, while both firms increase their use of external financing, small firms rely more on debt to finance investment. In fact, cash reserves of large firms appear to be a strong substitute for debt in response to a corporate tax cut. These findings are very interesting, delivered by a very careful construction of an interesting database and by the application of a sound econometric methodology. The evidence carries very relevant policy implications and provides a channel justifying a very relevant size of the tax multiplier.
Ruhollah's econometric competence is confirmed by the first chapter "State-Dependent Macroeconomic Effects of Tax Changes: Esti-mates Based on Narrative Records in the U.S." which provides evidence on the state-dependent macroeconomic effects of tax liability changes in the United States. This paper does not break new ground but it shows a very deep knowledge of frontier empirical methods and the ability of using them. Furthermore some new insights are offered by the findings that the effects of tax changes depend on whether the tax changes are tax-cuts or tax-increases. Those tax cuts taken to stimulate long-run growth are more likely to increase growth and reduce deficits in good times than bad times, but instead, tax increases taken to deal with an inherited budget deficit have strong effect on deficit reduction during bad times.
"Dynamics of Cash Holding: Evidence from U.S. Manufacturing Firms 1956-2014" (joint with Morteza Zamanian) is the last chapter of this dissertation which explores the long-run dynamics of corporate cash holding using a novel dataset of U.S. manufacturing firms.

Ruhollah is a very solid researcher with a deep passion for the topics to his interest and the capability of producing very interesting empirical results and using the appropriatetheory to interpret them.

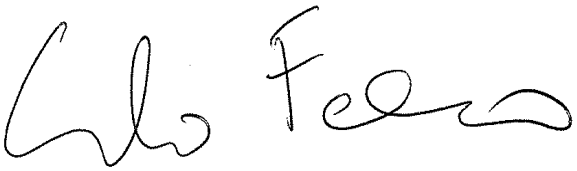
An obvious benchmark that I can offer to Ruhollah are the Phd students that Bocconi has recently produced. Our PhD in Finance and Economics has a good track record of placements: last year Roberto Steri obtained a position as Assistant Professor at Lausanne University, two years ago Andrea Tamoni joined LSE-Finance and Daniele Bianchi joined Warwick Business School, three years ago Arie Gozluklu was made Assistant Professor at Warwick Business School and Felix Suntheim joined FSA in London. Ruhollah clearly belongs to this group, although his innovative potential is slightly below that of our best performer, Andrea Tamoni.

I would put him at least at the same level with the two Bocconi's students that are on the Market this year, Madina Karamysheva and Francesco Consonni, on behalf of whom I am also writing reference letters.

It is indeed with great pleasure that I give my support to Ruhollah, any institution with an interest at the interface between macroeconomic policy and firms' behaviour should see him as a great opportunity.

I hope this will be helpful,

Carlo A.Favero
Deutsche Bank Professor of Asset Pricing and Quantitative Finance



Bocconi

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Milano, December 03, 2015

To Whom It May Concern:

I am writing to provide information on Ruhollah Eskandari, who is now applying for a position at your institution.

Ruhollah is doing a PhD at another Milan university, the Catholic University of Milan; however, because of the topics he is interested in, I was asked to be one of his co-advisers, and I happily agreed.

I met Ruhollah more than two years ago. Like most PhD students in search of a thesis topic, he looked a bit disoriented at first. However, I was immediately struck by his determination. He wanted to work on fiscal policy, and after circling around different ideas he converged on what became his first paper, "State-Dependent Macroeconomic Effects of Tax Changes: Estimates Based on Narrative Records in the U.S.". As the title says, the idea was to estimate responses of the economy to tax shocks in different states of the economy, slacks or booms. The same idea had been investigated in a few other papers in the previous two years regarding government spending shocks, but at the time this was the first time that it was applied to tax shocks (a few papers on state-dependent responses to tax shocks have been written since).

I saw how, little by little, Ruhollah wrote a state-of-the-art paper on the issue. The results are indeed interesting and, I would say, important (which is not something one can often say of PhD theses: there is indeed an asymmetry between output responses to tax shocks in good and bad times. Rhollah then applied every conceivable technique and estimation method to check the robustness of his results.

One very important aspect of the paper, and a true innovation in the literature, is the estimation of responses to negative and positive tax shocks. The literature had always assumed that they are the same, but there are a number of theoretical reasons why they could be different. Ruhollah does find that indeed tax cuts have stronger effect.

During my interactions with Ruhollah, I was struck by his persistence and determination. From the confused beginning he managed to put together a coherent approach and a very clearly written paper; moreover, he also struck me as a possessing the attitude of the true researcher: if you encounter a problem that looks interesting but cannot be addressed with the techniques you have, take a step back, invest some time in the new technique, and do the right thing.

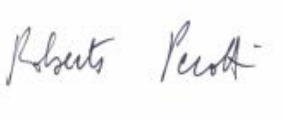
After writing the first drafts of the first paper, Ruhollah left for a semester at UCSD, where I worked with Valeri Ramey and made further progress on the first paper, and initiated the other papers. He then came back to Milan, but a few months later I left in turn for Rome, where I worked for the government for a whole year. Therefore, I was not able to keep in contact with Ruhollah, but he continued working on the new papers, one of which became his job market paper. In this, he also interacted with my colleague Carlo Favero, who will be in a better position to discuss the job market paper.

My own reading of the paper is that Ruhollah has made an enormous intellectual progress, showing a remarkable ability to address a completely new and original issue. This involved the collection of data, thinking through a non-trivial theoretical framework, and an empirical framework to investigate convincingly the transmission mechanism of tax shocks. This is definitely not derivative work, and it is a true step forward, conceptually, in the literature on the effects and transmission of tax shock.

Ruhollah is a soft-spoken, low-key person, but, once again, incredibly motivated and determined. He is also a deep thinker, something one may take some time to appreciate because he is so soft-spoken and unassuming. He is one of those rare people that keeps putting his own bar higher and higher, without arrogance but also without fear. Finally, he is a macroeconomist with deep interest in policy-relevant issues, but at the same time well aware of the need to investigate them with a rigorous approach.

I believe that, because of all these qualities, Ruhollah has more potential than any Bocconi PhD student I have come across in recent years. Because of his interests, he would be a perfect fit in central banks or international organizations, and also in university departments below the top fifteen.

Sincerely



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UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI ECONOMIA MANAGEMENT E METODI QUANTITATIVI

Recommendation letter for Ruhollah Eskandari

I am writing to recommend Ruhollah Eskandari a Ph.D. student in Economics at the University of Milan who is still working on his final thesis on "Three Essays in Tax Policy, Macroeconomics, and Corporate Policies".

I know Ruhollah as the main advisor for his final thesis, while the co-advisors are Prof. Roberto Perotti, Prof. Valerie A. Ramey and Prof. Roger Gordon. I met Ruhollah for the first time in 2011, when he started to attend our PhD program in Economics. He passed all the first two years exams with good scores and he immediately started to work on the first paper of the thesis. From March 2014 to January 2015 Ruhollah visited the University of California at San Diego (UCSD) where he had the opportunity to work with leading experts in the fields related to his final thesis. This experience enormously improved the Ruhollah's competences in the economics and econometrics aspects related to the transmission of fiscal policy shocks to the real economy.

The first chapter of his thesis, entitled "State-dependent macroeconomics effects of tax changes", is a promising paper in the empirical literature on the transmission of fiscal policy shocks. In particular, it can be included among the growing number of empirical studies providing evidence that multipliers are different depending on the state of the economy. Ruhollah presents a state-dependent model where the state of the economy is distinguished between periods of slack and non-slack in the economy. The fiscal shocks are identified using the narrative approach by Romer and Romer (2010), while the non-linearity in the model is inspired by Auerbach and Gorodnichenko (2013) and Owyang, Ramey and Zubairy (2013). Impulse responses, used to evaluate the transmission of fiscal policy shocks in the two different regimes, are obtained using the Jorda's (2005) local projection technique. The empirical results are complemented with a detailed set of robustness checks, highlighting the Ruhollah's maturity in the implementation of all econometric techniques generally used in the empirical literature in the field.

In the second chapter, entitled "Tax Policy and Investment Behavior of Small and Large Firms", Ruhollah investigates the effects of exogenous tax changes on both real and financial variables of firms of different sizes. As in the previous paper, he started with the narrative approach by Romer and Romer (2010), and the subsequent contribution by Mertens and Ravn (2013), for identifying exogenous corporate and personal income tax shocks. Employing a local projection model he finds that investments, sales and inventories increase in responding to a corporate tax cut across both small and large firms. However, the response to tax shocks is different according to the dimension of the firms, in particular for the business investment. As for the previous paper, Ruhollah provides a detailed robustness analysis to strengthen his empirical findings.

The third chapter, entitled "Dynamics of Cash Holding: Evidence from U.S. Manufacturing Firms 1956-2014" reports interesting evidences on the long-run dynamics of corporate cash holding. In this work, Ruhollah and his coauthor (Morteza Zamanian) use a novel dataset on US manufacturing firms and show that the long-run trend of the cash ratio has been roughly U-shaped since 1955. This evidence is firstly obtained through a detailed descriptive analysis and subsequently confirmed by standard econometric regression models.

My personal opinion is that all the chapters of the thesis can be considered for publication on international journals. Moreover, in this period, Ruhollah is working on another paper on the fiscal austerity and its impact on the European firms (with Carlo Favero).

Having read all his works, and having participated to different Ruhollah's presentations, one of which in a workshop for PhD students in Perugia (Italy) in August 2013, I have had the opportunity to appreciate intellectual ability, personal qualities and a talent for empirical research. He is a bright researcher with good time series econometric skills, in particular concerning the Structural VAR modelling. I have been particularly impressed by Ruhollah's knowledge of the empirical literature on the transmission of fiscal policy shocks. My personal impression is that Ruhollah can be considered as a good applied economist, with good knowledge of the main econometric techniques generally implemented by macroeconomists.

To conclude, Ruhollah is a bright researcher with strong motivations. This makes him an excellent candidate for a position in a research unit of an international economic institution or central bank, as well as in any economic department in academia.

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Yours sincerely,



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