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February 28, 2016

NBER Household Finance Working Group

Dear Madam/Sir,

I am thrilled to write this letter of recommendation for Emil Verner, who is applying for the NBER Household Finance Working Group Small Grants. Let me begin by saying **Emil Verner is the strongest graduate student I have advised** in my academic career. He is creative, insightful and possesses excellent empirical skills. He will benefit greatly from the NBER grant as he is embarking upon an ambitious series of empirical projects in Hungary. I enthusiastically and wholeheartedly support his grant application.

I have been Emil's primary advisor since his start at Princeton. Emil is in his fourth year at Princeton, and already has built an impressive profile. He has two finished papers (either submitted or very close to submission to journals), and is working on a very exciting research initiative in Hungary. I will discuss Emil's proposed research project in Hungary first (for which he is applying for funding), and then describe his finished work.

Emil has gotten access to administrative credit registry data at the Hungarian central bank which enables him to investigate the consequences of household indebtedness, exchange rate volatility and debt-forgiveness for distressed borrowers for the real economy. The combination of highly detailed credit registry data and some natural experiments puts Emil in an excellent position to answer some otherwise unanswered but very important questions. The NBER grant will enable Emil to work in Hungary and also obtain some additional data as needed for his project.

Hungary went through a number of interesting transitions that lend themselves to exciting empirical research. First, Hungary experienced a large expansion in credit to the household sector in the 2000s. Interestingly the run up in debt was some in local currency, but a large part was in foreign currency – Swiss Franc in particular. Second,

there were a series of unexpected depreciations post-2008 that raised household debt burdens by as much as 50 percent for those who had borrowed in Swiss Franc. Third, in response to the high debt burden for foreign-denominated loans, the government enacted policies that reduced principals and removed exchange rate risk from household balance sheets.

The events create a number of valuable natural experiments that Emil plans to use to significantly expand our understanding of how global financial shocks impact the local real economy through the household balance sheet channel. This is by and large an unanswered question.

The unique setting and access to credit registry data enables Emil to first estimate the choice of who gets exposed to foreign currency debt. He can then estimate how households respond in reaction to unanticipated exchange rate shocks, and whether the local economy has the capacity to effectively absorb the real consequences of such shocks. The international economics literature suggests that in the presence of financial frictions depreciations can have contractionary effect if agents have foreign liabilities. I believe Emil's will be the first paper that can explicitly test these models from a household balance sheet perspective.

A second fascinating aspect of Emil's research project is that it can evaluate the impact of government policies designed to write down large principal balances on Swiss-Franc mortgages, and to take future exchange rate risk away from the indebted households. There are a number of interesting questions here, from separately estimating the effect of lower real monthly payments (the interest rate effect), to reduced real value of liabilities (the old Fisher's debt deflation effect), to the effect of removing effect of exchange rate volatility and making domestic monetary policy more relevant for domestic households. Emil can first estimate the impact of these channels at the micro (household) level and then test if these partial-equilibrium household effects have implications at the macro level by testing for regional impact of these shocks.

The link from micro to macro requires that Emil put together additional data sets on spending, employment and other outcomes at the zip code and other geographical levels. The NBER grant will go a long way in helping Emil put together such data sets in

Hungary. **I am highly confident that a successful implementation of Emil's research project will make him a star on the Phd market.**

Let me now briefly describe two papers that Emil has already completed.

Emil's first paper was co-written with his class mate Graham McKee (I'm also writing a letter for Graham, who is another excellent candidate). The paper exploits cross-state variation in the generosity of UI benefits to generate insurance shocks for the unemployed during the Great Recession. The authors use this natural experiment to look at expenditure outcomes using Nielsen data on household spending, and show convincing evidence that UI benefits helps insure consumption.

In particular, the authors exploit the dramatic expansion in the duration of unemployment insurance (UI) benefits that followed the great recession. They use variation across states in the timing and generosity of UI expansion to estimate how consumption responds to extended UI benefits. The question is theoretically interesting as it has often been argued that unemployed and displaced workers have high marginal propensities to spend. Hence any increase in transfer towards them is likely to have strong demand effects.

Using the cross-state variation in UI benefits extension, the authors estimate that an additional week of UI increased household consumption by 1.7 percent. Moreover, as conjectured, the unemployed have high MPC with estimates in the range of 0.59-0.91. This paper was written at the end of their second year in graduate school by Emil and Graham, and was considered as one of the best in their cohort.

This paper reflects a number of qualities that both Emil and Graham have that should serve their possible collaboration with JP Morgan Institute really well. First, they are both very comfortable working with data, with both Emil and Graham possessing excellent skills in Stata and Matlab. Second, they are inclined to work on question that use large micro data sets (like the one JP Institute is developing), but have macro ramifications. For example, in their UI paper, the aim is not only to estimate the propensity to spend out of unemployment benefits, but to back out the general equilibrium impact of the UI benefits program under various modeling assumptions. Third, their interests lie on the intersection of macro and finance, which is a rapidly expanding area of research, especially in the wake of the global financial crisis.

Emil also has a second paper, "Household Debt and Business Cycles Worldwide", which he co-wrote with Amir Sufi of University of Chicago and myself. It has been a wonderful experience working with Emil as a coauthor, and I very much hope that I can work with him in the coming years. The paper has benefited greatly from Emil's insights.

The paper analyzes the role of household credit growth for growth. The traditional macro model suggests that access to credit should be good for growth. However, a world with myopic agents or a world with "aggregate demand externalities" can lead to the opposite prediction: greater availability of household credit boosts short-term consumption at the expense of long-term capital formation and hence growth.

We put together a large panel data set to show that a rise in the household debt to GDP ratio predicts lower output growth and higher unemployment over the medium-run, contrary to standard macroeconomic models. GDP forecasts by the IMF and OECD underestimate the importance of a rise in household debt to GDP, giving the change in household debt to GDP ratio of a country the ability to predict growth forecasting errors.

We also use lower credit spreads and increases in risky debt issuance as instruments for the rise in household debt to GDP to argue that our results are supportive of recent models where debt growth is driven by changes in credit supply, borrowing constraints, or risk premia. We also show that a rise in household debt to GDP is associated contemporaneously with a rising consumption share of output, a worsening of the current account balance, and a rise in the share of consumption goods within imports. This is followed by strong external adjustment when the economy slows as the current account reverses and net exports increase due to a sharp fall in imports.

Finally, an increase in global household debt to GDP also predicts lower global output growth. The pre-2000 predicted relationship between global household debt changes and subsequent global growth matches closely the actual decline in global growth after 2007 given the large increase in household debt during the early to mid-2000s. Our results have important implications for the role of finance in the macro-economy, and the continued increase in household credit as a function of income in many countries across the world.

Let me end by saying that I am truly impressed by Emil's empirical skills, not only on the data side, but also in econometric theory. A unique quality of Emil is that he is equally at ease with traditional panel data analysis, as well as macro time-series econometrics. This is a rare combination of skills, and a combination that is likely to yield high return going forward for Emil.

Emil was also awarded the Woodrow Wilson School Fellowship, which is a competitive and prestigious fellowship awarded to a few PhD students in social sciences at Princeton. The fellowship allows students to devote full time to research as they do not have to teach during the fellowship years.

Let me reiterate in the end that **Emil has my strongest possible support.** I very much hope that you will offer him the research grant.

Best Regards,

Atif Mian