Bank-Firm Credit + Bartik

An

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Abstract

Your abstract.

1 Introduction

Your introduction goes here! Simply start writing your document and use the Recompile button to view the updated PDF preview. Examples of commonly used commands and features are listed below, to help you get started.

2 Discussion

2.1 3.20

Replication of the Bartik instrument and perhaps other methods in Do Credit Market Shocks Affect the Real Economy? (Greenstone et al. 2020) When applying the method to the New Third Board data, we can put the firm in the position of the county in this paper, and explore the relationship between the bank shock (nonbank?) and the firm operation.

Try to apply the shift decomposition method (Weinstein and Amiti 2018) to the New Third Board **NEEQ - National Equity Exchange and Quotation** data and observe the result.

3 Thought

3.1 3.24

Basic thought:

The main purpose of Greenstone's paper is to estimate the bank shock effect on a county level. We can analogy the firm-level index as the county-level index in this paper, from total asset growth rates which could be measured in many ways to the rate of change of employees.

The firm-level data:

I have written it above. Which specific variables to choose is still unknown, so I plan to see them again and outline some variables which seems important to the whole economics.

My questions about this AEJ:

- Why the s_js are re-centered? Can't there be any nation-wide trend of bank lending?
- Why we should standardize the county-level predicted shock? What's the meaning of it?

4 Literature

4.1 3.20 Acemoglu 2020

Main result:

The main result of the study is that the **adoption of industrial robots** has **negative effects** on **employment and wages**, particularly in routine manual, blue-collar, assembly, and related occupations. The study finds that the negative effects of robots on employment and wages are not limited

to manufacturing industries, but also affect nontradable sectors such as construction and retail. However, the study also finds that there are potential benefits to using industrial robots, such as increased productivity or efficiency.

Research Method:

(Why we should consider the endogeneity problem: there are two related reasons why the US exposure to robots could be correlated with the error terms.

First, some industries may be adopting robots in response to other changes that they are undergoing, which could directly impact their labor demand.

Second, any shock to labor demand in a commuting zone affects the decisions of local businesses, including robot adoption.)

The authors use a **novel instrument** for robot adoption based on **industry-level advances** in robotics and **local industry employment**. They also generate **predicted values for robot adoption as an instrument** using a reduced-form equation that includes the instrument and other control variables. This approach is particularly useful when **there are no exogenous variables available that can be used directly as instruments**.

First, we should obtain the technology development in 5 main countries in Europe. And then we can calculate the predicted value.

Specifically, they use a two-step procedure:

1. Estimate a regression model that calculate the **robot adoption** without endogeneity using the robot adoption data in Europe. The authors regard the trend in Europe as a exogeneous factor which indicate the overall spread of robotics.

   (Focusing on countries that are ahead of the United States helps us isolate the source of variation coming from global technological advances (rather than idiosyncratic US factors).)

$$\overline{APR}_{i,(t_0,t_1)} = \frac{1}{5} \sum_{j \in EURO5} \left[\frac{M^j_{i,t_1} - M^j_{i,t_0}}{L^j_{i,1990}} - g^j_{i,(t_0,t_1)} \frac{M_{i,t_0}}{L^j_{i,1990}} \right], \tag{1}$$

   While the actual robot adoption (adjusted penetration of robots) in a place in the US is:

$$APR^{US}_{i,(t_0,t_1)} = \frac{M^{US}_{i,t_1} - M^{US}_{i,t_0}}{L^{US}_{i,1990}} - g^{US}_{i,(t_0,t_1)} \frac{M_{i,t_0}}{L^{US}_{i,1990}} \tag{2}$$

   And the US exposure is:

$$\text{US exposure to robots}_{\,c,(t_0,t_1)} = \sum_{i \in \mathcal{I}} \ell^{1990}_{ci} \cdot APR_{i,(t_0,t_1)}, \tag{3}$$

   We are glad to see the APR & $A\bar{P}R$ is positive correlated.

2. Use these **predicted values as an instrument** for actual robot adoption in our main analysis. The process is a **standard 2SLS**.

What I find interesting:

"Crucially, however, any extrapolation about the future effects of robots should acknowledge not only the usual uncertainty associated with such exercises but also the possibility that some of the general equilibrium effects working through technology might emerge only slowly (Acemoglu and Restrepo 2018c) and that the response of employment and wages may be different once robots become sufficiently widespread."

This inference should not be overinterpreted as preventing technological development, and the authors argue that employment and wages may be subject to different laws as machine production becomes more widespread.

In page 38, the authors use a model to demonstrate that capital deepening and technological changes that do not automate tasks previously performed by labor do not generate a significant negative effect on employment. Which means that the impact on employment and wages is caused by the substitution effect!

How to do robustness check?

- Using different data source to generate predicted value:

  Show the exact **construction of exposure to robots** does not affect the results by estimating where this measure is computed from the average of all European countries and from the average of EURO 5 plus Germany, as well as a specification where they use the 1990 (rather than the 1970) employment distribution.

- Consider whether it is possible that the Robot exposure rate of US and Euro is high and the IV is unreliable due to a common cause (international competition):

  Investigates whether international competition affects robot adoption decisions in both the United States and Europe, which could be a related threat to their IV strategy.

  But they argue that the manufacture is more related with import from China and India, and the regression result shows that robot adoption is more associated with lower labor share and employment and greater value added and labor productivity. This suggests that robot adoption is driven by productivity considerations rather than international competition.

- Controlling all kinds of factors that may affect the result:

  Furthermore, the paper examines various alternative specifications for controlling for time-varying factors that may affect employment and wages, such as **industry-specific trends, state-level policies, and regional shocks.**

  It seems that they used state fixed effect to control for any state-level policies or shocks. The basic idea behind fixed effects is to include a set of dummy variables.

4.2 3.24 Greenstone 2020

Several validity:

- The difference of characteristics of the two subsets of banks. The predicted lending shock is the classification criterion.
- The correlation between county's fixed effect (d_i) and the market-share weighted average fixed effect of banks located in that county (s_i). The result is that they are not correlated.
- They also assess the interaction between banks within a county, the correlation between regional lending and federal policy. But they did not find anything significant.
- Robustness to a wide set of county characteristics.
- Using multi-state firms with potential sources of credit beyond banks to check for the confounding factors that affect all establishments in the same county.

Economics Models and Results:

- The Relationship between the Predicted Lending Shock and Actual Loan Originations

  Confirming a robust and statistically significant relationship between the predicted lending shock and loan originations. (So we could use the predicted value as an IV)

- The Relationship between the Predicted Lending Shocks and Economic Activity during the Great Recession

  Taking special consideration about both the current and the cumulative effects of the shocks in 2008 and 2009, by setting an amount of dummies. They select the dependent variables from three perspective: "Small Stand-alone Firms", "Small Establishments in Multi-unit Firms", "County-Level Economic Outcomes", hoping to find the bank shock effects on different kinds of index. However, none of these variables show strong significance, neither statistically nor economically.

- The Relationship between the Predicted Lending Shocks and Economic Activity during "Normal" Economic Times

  They add the current year effect and the last year effect (every shock has an effect over two period), and meanwhile allow the existence of the special shocks in 2008 and 2009. Still there is no strong evidence of relationship between the predicted lending shocks and economic activity.

5 Data

5.1 3.24

If we just imitate the AEJ paper:

In my opinion, the predicted value of bank shock can be obtained in three possible ways:

- Estimating s_j on given data by pairing each two year and calculate the lending rate of change in every year, and obtain the predicted shock for each bank as the weighted sum of s_j, where the weight is the loan share ratio in this firm in the first year of each paired years. I think it has a strong operability, but probably the bank shock we calculate in a dataset with those lending data only for new third board firms cannot reflect the real bank shock overall. Many banks and loan companies only show up in the whole dataset for several times, so the shock we calculate could be totally unreliable.

- Estimating s_j on the nationwide lending change ratio for each bank, and obtain the predicted shock for each bank as the weighted sum of s_j, where the weight is the loan share ratio in this firm in the first year of each paired years. The potential difficulty is we should collect the total lending shock data for every bank, or even every financial institution appearing in the credit data for the new third board firms, and the match them to calculate that predicted value.

- Instead of trying to get the bank-level shock data first, we could merge these financing channels to several types, and then estimate the shock in each type of financing channel as the component of the predicted shock for each firm. It is more convincing because if we merge those small banks or institutions to a same kind, then each kind of channel will contain much more lending data, which will provide us a more accurate value of the shock. But there is a potential problem, which is, among each kind of financing channels there probably exists a large heterogeneity, which cause the overall trend of this kind of channel does not have a strong ability to explain the loan change of any company. Well, it is just my guess, and I think we can still regard the heterogeneity as a error term first.

Then, first, we should check the correlation between the actual loan originations and the predicted value, to ensure that the Bartik IV we choose is strong correlated with the "x" and thus reasonable. I think we should explain why this predicted value is exogenous in the structural model, however I do not see obvious performance of the exogeneity test in this AEJ. Perhaps they just gave a brief instruction in words..

Then we could do a 2SLS regression with predicted shock as an IV. In this part we could do whatever we think is interested or important, or both.

At the firm level, the indicators we are more curious about are generally number of employee, guarantee conditions, total assets, income, profit, R&D, cashflow and so on. (The index above is just based on my guess and I do not know much about the firm conditions, so I will ask someone else later.) The data we have is somehow advantageous because it contains the information about the industry, the locations, and details of each loan. So we could seek some possible differences among industries, provinces and enterprise scales, maybe some other things, and see if there is something interesting.

Besides, from the AEJ we could think about whether there was important events during 2013-2020 that we could regard as a shock/pulse. If so, we can inquiry whether there is a significant difference in the lending mode between event years and normal years.

More:

Since the Bartik IV can be used in many "Shift-Share" cases, I think we can broaden the train of thought, which means we can come up with some other possible "Shift". For example, the changes of shares of banks and nonbanks, or the change of informal finance proportion in firm lending (that is not very significant I remember, but I should think about it once more). Umm... I think there is a similar trend in the amount of capital from informal finace in many provinces, and I will check it again tomorrow.

6 Research Design

7 Econometric Model and Result