Assignment 4: Referee Report

*E*quity Market Reactions to Infer Exposure to Trade Liberalization

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Summary

This paper uses publicly available stock prices to conduct an event study on the impacts of trade liberalization on US firms. By empirically testing the effects of two major trade liberalizations, one with China and one with Canada, the paper analyzes firm-level effects on returns to capital and the distributional implications of trade within this set of firms. Previous approaches focus on exposure to trade in terms of changes in import competition. In comparison, the approach of this paper has three important advantages:

1. Assuming all new information relevant for firm value is fully reflected in the stock price, this captures all channels (direct and indirect) of exposure and general equilibrium effects.

2. This produces estimates for all publicly traded firms, including services firms, which are usually ignored in the import competition approach.

3. The methodology is easily applicable to study all types of liberalization events (both tariff and non-tariff changes).

The first liberalization event they study is the US granting of Permanent Normal Trade Relations (PNTR) to China in October 2000, which reduced expected US import tariffs on many Chinese goods and eliminated substantial uncertainty about US-China relations. By measuring the firm's average abnormal returns (refer to this as AAR^{PNTR}) relative to the market, the paper finds substantial heterogeneity in the impacts of PNTR . Overall, the paper finds a negative correlation between AAR^{PNTR} and the usual variables used to assess import competition. Beyond these standard measures, the paper also finds a relationship between the $AARs$ and changes in firm value, employment, and capital. On the distribution side, the paper finds that a large majority of firms have negative predicted relative operating profit after the liberalization, while a small group of very large goods and service firms with positive AAR^{PNTR} are predicted to have substantial relative gains. When looking at economy-wide averages, these gains outweigh the smaller firm's relative losses. Applying the same methodology to the 1989 Canada-United States Free Trade Agreement (CUSFTA) yields similar results to the PNTR event.

Suggestions

Overall, the paper is very straightforward in its methodology, open about potential pitfalls, and thorough in the robustness checks they run to address this. Their methodology seems widely applicable to a range of topics and is thus a fruitful contribution to the trade literature. Below, I lay out the paper's basic set up to make it easy to refer to in my suggestions.

What is the abnormal return the paper wants to measure? Let a firm's stock price be a function of (X_t, e_t), where e_t is the information about the event of interest, and X_t contains all other information relevant for firm value. The abnormal return of an event that occurs at time τ on a firm is

$$AR^*_{j,\tau} = R_{j,\tau} - E\left(R_{j,\tau} \mid X_\tau\right)$$

What do we actually observe?

$$AR_{j,\tau} = R_{j,\tau} - \left(\hat{\alpha}_j + \hat{\beta}_j F_\tau\right)$$

Thus the ability to properly estimate $AR^*_{j,t}$ relies on whether $E\left(R_{j,\tau} \mid X_\tau\right) = \hat{\alpha}_j + \hat{\beta}_j F_\tau$. To see the potential biases, decompose F_τ into the component that is caused by X_t and the component that is caused by e_τ:

$$F_\tau = F_\tau^X + F_\tau^e$$

The normal return that we expect to observe if the event did not occur is given by

$$E\left(R_{j,\tau} \mid X_\tau\right) = \alpha_j + \beta_j F_\tau^X + \epsilon_{j,\tau}^X$$

But the regression to approximate $E\left(R_{j,\tau} \mid X_\tau\right)$ is:

$$R_{j,\tau} = \alpha_j + \beta_j \left(F_\tau^X + F_\tau^e\right) + \epsilon_{j,t}^X + \epsilon_{j,t}^e$$

Then what we observe is given by the following:

$$AR_{j,\tau} = R_{j,\tau} - \left(\hat{\alpha}_j + \hat{\beta}_j F_\tau^X + \epsilon_{j,\tau}^X\right) - \hat{\beta}_j F_\tau^e + \epsilon_{j,\tau}^X = AR^*_{j,\tau} - \hat{\beta}_j F_\tau^e + \epsilon_{j,\tau}^X$$

For $AR_{j,t}$ to equal $AR^*_{j,t}$, the true value of the abnormal return, we must assume that

1. $\epsilon_{j,\tau}^X = 0$
2. $\hat{\beta}_j F_\tau^e = 0$.

Suggestion 1

My major concern is the lack of discussion around the estimation window used for their market model coefficient estimates. They calculate their AAR_j^{PNTR} values using a standard market model, which uses the market return, $R_{m,t}$ as the only systematic factor (the F_τ above):

$$AR_{j,t} = R_{j,t} - \left(\hat{\alpha}_j + \hat{\beta}_j R_{m,t}\right)$$

$\hat{\alpha}_j + \hat{\beta}_j R_{m,t}$ here is an estimate of the normal return to the firm, $E[R_{jt}|X_t]$. α_i and β_i are estimated using a estimation window prior to the events, preventing the event itself from influencing the normal performance model parameter estimates. The authors seem to be using stock prices from 1999 as the estimation window, with a footnote that in unreported results, they run robustness checks using an estimation window of 250 days which end 30 days before each event.

My first concern is with the size of the window. Calculating β_i for firms over such a long period necessarily means that firms with more volatility over time will have abnormal returns that are

larger in absolute magnitude, and hides trends of firm value that could be more predictive of their actual expected return. For example, the dot-com bubble is right on the horizon in early 2000. Taking the β_i from 1999 to calculate expected return in May 2000 will likely overestimate the abnormal returns to firms in the tech sector, since the tech sector as a whole was trending upwards in its stock price.

The second concern with this estimation window is that the first event of interest is May 2000, and the last event is October 10th, so there are huge time lags in between the estimation and event windows. If the best predictor of my stock price today is my stock price tomorrow, then it is suggestive that shorter estimation windows right before the event is much more informative of the expected price tomorrow. It is also surely what traders are using on the ground. Perhaps I am missing a potential source of bias with using an estimation window right before the event window. If so, this still should warrant a discussion in the paper. Especially as this is targeted not only to a finance audience, but also to trade economists who might not be familiar with the conventions of these asset pricing methods, it is important to be clear on why the authors choose these key estimation steps.

Suggestion 2

The paper is transparent in the flimsiness of assumption (2), that $\hat{\beta}_j F_\tau^e = 0$, and it caveats that we have to interpret the AAR_j estimates as the effect of the policy on firms relative to its impact on systematic factors, $\hat{\beta}_j F_\tau^e$. In section 4.3, they discuss how policy changes could affect the market return, which means the AAR_j^{PNTR} would be underestimated if the policy affects the market positively, and over-estimated if the impact is negative.[1] They address this by considering a range of plausible F_τ^e values, plugging this into their calculation of AAR_js, and show that the distributional implications are largely unchanged by these adjustments (shown in figure A.9).

If their reported AAR_j are pegged against the market, then adding in positive market effects would obviously move all values of the AAR_j up by $\hat{\beta}_j F_\tau^e$ (and conversely for negative market effects), roughly preserving the shape of the distributional effects. Thus, Figure A.9 is not surprising to me, since it mechanically must give this result. However, what is important are the aggregate implications of the levels of AAR_j. For example, one of their main distributional findings is that a large majority of firms's operating profit are negatively affected by the liberalization, while a small group of very large firms are predicted to have substantial gains, enough to outweigh the losses of the other firms. Would this statement still hold, if say, the policy has positive effects on the overall market?

Systematic factors thus have important implications for the levels, rather than the shape of the distribution, of impacts on firms. It then seems important that the authors show at least some suggestive evidence of how the policy affected the market as a whole. For example, they already include indexed returns during 2000 in Figure A.2 of the appendix, but do not discuss the implication that the market falls during all event dates. They could also include comments from policymakers, newspapers and bankers at the time to give more qualitative suggestions.

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[1] On page 7, the authors state that they address this concern in section 5 of the paper. I could not actually find this discussion in section 5, but instead found this in section 4.3, at the top of page 28.

Suggestion 3

It would be interesting break out these results for the financial sector. The rise of financialization in the US is well documented, and has implications that are distinct from the usual service sector. First, it is intricately tied to the rest of the market, and its institutional power has economy-wide effects unlike say, the professional services sector. Second, it has been documented as a tool for soft economic imperialism for the US.[2] For both these reasons, how much the financial sector gains relative to other sectors is important in understanding the economic power the sector is amassing, and its implications for further financial globalization. I imagine incorporating this into the paper would not be too difficult; for example, in Figure 7, it would be simply adding another graph for financial services.

Smaller Suggestions

- COMPUSTAT should also have data on a firm's wage bill, so it seems straightforward to look at the relationship between a firm's AAR_j and the wage bill, as well as the average wage (divide the wage bill by employment). This would supplement the story of how the AAR_j affects not only worker productivity, but income growth (or decline) in these firms. This could then tie the paper to yet another strand of literature on how the labor share of GDP has been steadily declining over time.

- Are all five of the events by which the PNTR became law actually surprising? My intuition would be that the introduction of the PNTR bill is probably highly anticipated, and Clinton signing the PNTR into law would be highly probable since it has already passed through Congress. The paper does some tests in section 5.2, but it would be fruitful to have more qualitative background to make this convincing.

- Section 5.3 states that in Section H of the Appendix they re-estimate the different in difference for each of the five policy events separately. However, I could not actually find this in section H.

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[2]Kohli, Atul. "Imperialism and the Developing World: How Britain and the United States Shaped the Global Periphery." Oxford Scholarship Online:, February 2020, 57. https://doi.org/10.1093/oso/9780190069629.001.0001.