Innovation and Trade in the Presence of Credit Constraints (MS-2019066)

Dear Professor Kasahara,

Thank you very much for your decision letter in which you gave us the opportunity for another revision of our manuscript for possible publication in the *Canadian Journal of Economics*. In this letter, we document the changes we made to the paper in response to comments from the two reviewers and your comments. We have carefully revised the manuscript in response to the reviewer's requests. We believe the paper has again benefited from the revisions. Here, we first describe the main revisions made to the paper before addressing the reviewer's individual concerns. We thank you and the reviewers for your most relevant feedback and suggestions.

Best regards,

Reto Foellmi

Response to Comments from the Editor

Editor: *Still, I wonder what the results would be without quadratic terms. It would be good if the authors report a table that collects the result of Tables 3 and 5 from a specification just only with tariff rate changes without square term in the appendix. I somehow suspect that the result on constrained firms is not as clean as with squared term but would like to see how the results would be affected.*

Response:

This is a very valuable suggestion. We added the following text on p. 21 just above Table 3: "*Given the size of the tariff change, we allow for nonlinearities as proposed by the theory. For this aim, we include a quadratic term in the regression, allowing a more flexible specification*." We continue on p. 24 below Table 5: "*A potential drawback of adding quadratic terms is the fact that the results could depend on outliers. To check for this, we proceed in two steps. First, we removed the 5% extreme values as a robustness analysis. This leaves results of Table 5 largely unchanged but renders estimated coefficients of Table 3 insignificant. Second, we run the regressions without the squared term, the results are shown in Tables A5 to A8 in the appendix. Tariff cuts remain to have a negative effect but the coefficient loses significance for some specifications*."

When removing the squared term from the regressions shown in Table 3, Tariff Cut itself has a negative coefficient in columns (1) and (2) but is insignificant. In column (3), the positive and highly significant coefficient remains, while in column (4) the estimated coefficient is positive but not significantly different from zero.

In Table 5, without the squared term, we obtain the following coefficients of interest, that is on the variable Tariff Cut: column (1) positive and insignificant, column (2) positive and insignificant, column (3) positive and insignificant, column (4) positive and insignificant, column (5) negative and insignificant, column (6) negative and significant at 10%-level, column (7) negative and insignificant, and column (8) negative and insignificant.

Editor: *To address an issue of possible outliers, can you take out 5 percent of your observations with a very large magnitude of Tariff Cut variable and show that your result is robust for Tables 3 and 5 in the appendix.*

Response:

Following the suggestion, we removed the 5-percent extreme values from the estimation sample. Given the limited size of the data set, it is expected that not all regressions prove to be robust to this test. Overall, the estimated coefficients remain very similar in our main Table 5 but coefficients are insignificant in Table 3. We mention this additional robustness test on page 24 of the revised manuscript (see reply above). We document the results in the separate Tables A5 to A8 in the appendix.

Editor: *For Panel A of Table 6, I think what you would like to control for is not only country and industry fixed effects but also their interaction with CC dummy. I understand that you might not have enough power given the small sample size but, nonetheless, try this. If you don't have enough power, then report the result in the appendix.*

Response: We agree that this interaction term would be of interest. However, your concern about the lack of power turns out to be true. While coefficients remain the positive/negative sign their significance level drops below the 10-percent level. Bear in mind that only a fraction of firms answered the innovation-related questions. We follow your advice and report the results in the Appendix in Table A9, mentioned in the main text below Table 9 on p. 27 above.

Editor: *Table A4: similarly to the above comments, I think you would like to interact "Input Tariff Cut" with CC dummies here. Again, there is often high correlation between Input tariffs and output tariffs and you may not have power but, nonetheless, I would like to see the result.*

Response:

Thank you for this suggestion. We added the interaction term CC-Dummy with Input-Tariff-Cut and updated Table A4 in the revised manuscript accordingly. The estimated coefficients of interest are hardly affected by the additional control variable.

Editor: *Can you reply to the negative referee's comment on "I was mostly interested on whether the estimation sample was representative of the sectoral composition of the different Latin American economies under analysis"? Even if they are not, I am still fine with your empirical analysis as long as you are explicit about it.*

Response:

We tried to make that point explicit on p. 17: "*We interpret these sectoral shares as indicative that our estimation sample is representative for the shares in the whole economy. When conducting the survey, WBES aims to achieve a representative firm-level sample of an economy's private sector*." Hence, we feel confident that our estimation is based on a sample that is representative of the economies in terms of sectoral composition.

Specifically, we have the most observations for apparel (283), food (215), textile (74), synthetic resins (67), spinning (54), other industry (53), and metal products (40). In the estimation sample (as used in

Table 4 with the main results), we have the following distribution: Apparel (74), food (46), other industry (20), textile (18), synthetic resins (17), metal products (11), and spinning (10).

Editor: *Similarly, can you provide direct evidence on "the results show that there are no substantial differences in terms of geographic locations of firms between the two data sample (raw data vs estimation sample)"?*

Response:

Measured at the four-digit ISIC level, there are about 200 companies out of the 754 in the data set that were exposed to a tariff reduction. These 200 firms are not spread evenly across countries, supporting our choice of using WBES data from several countries in one geographic region.

In the raw data set, we have a distribution of companies as follows: Argentina (187 firms), Bolivia (20), Chile (191), Columbia (138), Paraguay (25), Peru (123), and Uruguay (70).

In the estimation sample (here we take Table 4 with the main results), we have the following distribution: Argentina (72 firms), Bolivia (13), Chile (78), Columbia (79), Paraguay (11), Peru (77), and Uruguay (32).

The fact that Peru is somewhat overrepresented is due to the fact that the largest tariff cuts are primarily found in Peru, a country that implemented trade liberalization across all sectors. Again, we can compare these numbers to the raw WBES data set in which the country shares are similar to both our data set as well as the estimation sample.

Response to Reviewer R1

We would like to thank the Referee for his/her highly valuable report. Below, we describe in detail how we address each of the referee's comments and suggestions:

Reviewer:

The non-linearity term*. In the main text the authors claim that the distribution G(ω) is non-linear (page 11). The shape of this distribution is not discussed in detail.*

Yet, in the econometric estimations they employ a squared term. If the relationship between tariffs and firm performance is non-linear why this non-linearity has to be captured simply by a quadratic term? The authors do not even discuss the possibility of considering a cubic term, for example.

Response:

Formally, we approximate the shape of the distribution with a 2nd order Taylor approximation. Hence, we capture the non-linearity with a quadratic term only. Higher order terms– while non-linear – does not need to be quadratic. Given the restricted sample size in our data set, we decided to include only a linear as well as a quadratic term, in our internal estimations we tried higher-order terms but they were not significant.

Reviewer:

2) The estimation sample. *In my first report, I had concerns regarding the reliability of econometric results given the limited amount of observations employed in some regressions. I asked the authors to provide further evidence on the representativeness of their estimation sample. They answered stating that their results are representative since the original survey was constructed to be representative. The fact that the original survey is designed to be representative does not imply that the authors' estimation sample is representative. I still have serious concerns on this issue. If you look at results reported in Tables 5 and A.4 of the current version of the manuscript, these results are based on few hundreds of observations. The authors did not show any evidence on the representativeness of observations included in the estimation sample.*

In their answer to my comments they claim that "the results show that there are no substantial differences in terms of geographic locations of firms between the two data sample (raw data Vs estimation sample)". The authors do not provide any direct evidence on this in the manuscript.

Moreover, I was mostly interested on whether the estimation sample was representative of the sectoral composition of the different Latin American economies under analysis. The authors do not provide evidence on this, as well. My concerns on this point are then still valid.

Response:

Thank you for this suggestion. We provide these numbers in the reply to the Editor: We have the most observations for apparel (283), food (215), textile (74), synthetic resins (67), spinning (54), other industry (53), and metal products (40). In the estimation sample (here we take Table 4 with the main results), we have the following distribution: Apparel (74), food (46), other industry (20), textile (18), synthetic resins (17), metal products (11), and spinning (10).