Did Trade Crisis Affect Different Exporters Differently? Case of Mexico

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Abstract: Drawing on Mexican customs transaction data, we document the margins of adjustment for Mexican exports to the United States between 2004 and 2010. Underneath the familiar conclusion that intensive margin changes drove the trade collapse of 2008-09, we find a significant heterogeneity in the importance of margins of adjustment across exporters of different sizes. In the pre and post 2008-09 trade crisis periods we find that: within industry, (i) firm exit rate is monotonically decreasing in size; (ii) conditional on survival, export growth is decreasing in size and highest for exporters smaller than the median firm, (iii) but the top decile of exporters grows faster than exporters of intermediate size (between median and top decile); (iv) probability of net product addition is monotonically increasing in size. During the crisis period these patterns remain remarkably stable, except that (iii) becomes weak. While the pattern of pre and post-crisis correlation of firm size with firm exit, growth in exports and net product addition is consistent with the literature, the finding that the crisis did not make smaller exporters more likely to exit, grow less, or expand less their product line is at odds with the chief mechanism(s) highlighted in the literature. Importantly, we find that the big exporters engaged in vertical supply chains were worst hit during the crisis.

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1 Introduction

World trade flows declined by about 12 percent during 2008-09 according to the World Trade Organization (WTO). This decline was larger than decline observed in the first year of the Great Depression, when trade fell by about 8 percent (League of Nations World Economic Survey, 1932-33). This trade collapse/crisis has led to an extensive line of research into the cause(s) of the collapse, both theoretical and empirical.[1]

We, on the other hand, focus on how the margins of adjustment at the level of individual exporters and products behaved during the trade crisis, and then compare it to the patterns observed in the pre-crisis and post-crisis period. In doing so, we ask the question - Is the pattern observed in the margins of trade adjustment during the pre-crisis, crisis and post-crisis periods consistent with the current workhorse models of trade?

Drawing on the Mexican custom transaction data for the period 2004-2010, we restrict our attention to Mexican exports to the United States (U.S.) since they account for more than 80 percent of total Mexican exports. We find that the pattern of pre-crisis as well as post-crisis correlation of firm size with firm exit, growth in exports and net product addition is consistent with the a large body of work, both empirical and theoretical, on firm level heterogeneity and international trade.[2] However, we also find that the crisis did not make smaller exporters more likely to exit, grow less, or expand less their product line, and this is at odds with the chief mechanism(s) highlighted in the literature.

Starting with firm exit (firm level extensive margin), we find that firm exit rate is decreasing in size in all periods. Importantly, the probability of exit of exporters relative to the top size decile of exporters is stable across the pre-crisis, crisis and post-crisis periods, even after controlling for industry fixed effects. Thus, smaller firms did not become more likely to exit during the crisis.

Second, while growth in sales of exporters (firm level intensive margin) is decreasing

[1] Two main explanations have been proposed - demand collapse and financial constraints. Disruption of global vertical production chains and inventory adjustments may have acted as amplification mechanisms.

[2] Throughout the paper, we define exit as exit from the U.S. market or exit from a particular industry of the U.S market. Given the data constraint, we are not able to see whether firms exit from the market altogether.

in the size of exporters in all three periods, sales do not contract for exporters of all size categories during the crisis.[3] In fact, sales of exporters smaller than the $70th$ percentile expand during the crisis period. It is only the larger exporters who suffer a contraction in their exports. After controlling for industry fixed effect, conditional on survival, export growth of establishments smaller than the median exporter relative to the top decile is significantly higher in both pre-crisis and recovery period, and this pattern is stable even during the crisis period. The within industry analysis also reveals that exporters in the top decile exhibit better export growth relative to exporters of intermediate size (between median and top decile), except during the crisis when their export performance is not (statistically) different from the top decile.

Third, the probability of increasing the number of products (within firm product level extensive margin) relative to that of the exporters in the top decile is monotonically increasing in size in all three periods, and remains stable during the crisis period.

In terms of the relative importance of these margins in the total change in exports we find that (i) firm exits explain only a small share of the total change in exports for any size category; (ii) smaller exporters adjust along the product level extensive margin, through net addition of products; (iii) exporters spanning the middle to the top end of the size distribution adjust along the intensive margin (adjustment in export sales of the same products). Importantly, the high share of product level extensive margin adjustment for small exporters does not change from pre-crisis to crisis to recovery period. On the other hand, for the biggest exporters (top size decile), the contribution of intensive margin turns sharply negative during the crisis period and explains the bulk of the decline in aggregate exports of Mexico.

Ignoring the effect of size and decomposing aggregate exports into extensive and intensive margin changes confirms that the intensive margin drives the majority of changes in exports - both at the firm and the firm-product level. This is consistent with the findings of other firm level studies - Bricongne et al. (2012) (for French exporters) and Behrens et al. (Forthcoming) (for Belgian exporters). Importantly, Bricongne et al. (2012) also analyze the margins of adjustment by size for French exporters and find that the large exporters ab-

[3]Size of an exporter is proxied by the total sales in the initial year of a period.

sorbed the shock mostly through the intensive margin while the smaller exporters adjusted along the extensive margin. And, most of the extensive margin loss in exports for the small exporters was due to firm exit, which stands in sharp contrast with our findings.[4] Furthermore, they do not compare their findings from the crisis period with those from the pre or post-crisis periods.

The pattern of pre-crisis correlation of firm size with firm exit, growth in exports and product line is consistent with the a large body of work, both empirical and theoretical, on firm level heterogeneity in international trade. However, the finding that the crisis did not make smaller exporters more likely to exit, grow less, or expand less their product line is at odds with the chief mechanism(s) highlighted in this literature.

The increase in survival probabality with the size of exporters is consistent with the self selection of more productive firms into becoming exporters, as emphasized in Melitz (2003), Chaney (2008), Das et al. (2007) and Bernard et al. (2003). However, these frameworks do not explain why conditional on survival export growth is higher for smaller exporters.[5] Eaton et al. (2007) also find similar pattern for small exporters in Colombia.[6] Arkolakis (2010) explains this asymmetric behavior of export sales by replacing the fixed cost of exporting in the Melitz/Chaney model with an increasing marginal costs of reaching additional consumers in destination markets. Lastly, the increase in number of products exported can be generated in a multi-product generalization of the Melitz framework as done in Bernard et al. (2011) and Bernard et al. (2010). The larger more productive firms can profitably export more number of products.

In frameworks that feature firm level heterogeneity in productivity, the two reasons highlighted for the trade crisis - demand collapse and credit constraints - should have affected the smaller exporters more adversely as compared to the larger exporters.

In case of a sharp reduction in aggregate demand average sales and profit margins will diminish, and the least productive firms shrink and are most likely to exit the market

[4] Gopinath and Neiman (2011) also decompose margins by size for Argentina during the 2001-02 crisis, but they focus on imports and implication of fewer imported varieties on productivity.

[5] Constant elasticity of substitution implies export growth is identical for all exporters.

[6] Kehoe and Ruhl (2003) find that the product categories with the smallest value of exports prior to NAFTA showed the largest increase in exports post NAFTA.

altogether. Larger, more productive, firms are more likely to survive by contracting profit margins. Among the surviving firms, the same mechanism will also cause the export sales of smaller exporters to fall relative to larger exporters.[7] These predictions are inconsistent with our findings. The literature emphasizing a collapse in aggregate demand as the cause of trade crisis is focused on aggregate implications and not on the asymmetric effects on firms of different sizes. Eaton et al. (2010) evaluate the relative contributions of changes in demand versus changes in trade frictions to the decline in trade, and conclude that the fall in demand was most important. Behrens et al. (Forthcoming), using firm-level data for Belgium, conclude that GDP growth of the destination countries is the single most important determinant of exports. Importantly, our results hold even after controlling for industry fixed effects, i.e. larger exporters perform worse than smaller exporters within industries. Thus, incorporating heterogeneity in demand shock across industries is not going to be sufficient to explain our findings.

The interaction between credit constraints and firm heterogeneity is also going to cause the smaller and less productive firms to be more affected by credit restrictions as a result of their size or lack of sufficient collateral and/or credit guarantees (Greenaway et al. (2007), Muuls (2008), and Manova (2008)). But, due to the lack of firm level data on credit constraints, most of the empirical work is at the sector level and focuses on implications for aggregate exports.[8] Chor and Manova (2012), using data on monthly US imports, find that countries with higher inter-bank rates (tighter credit conditions) exported less to the U.S. These effects were exacerbated during the crisis and especially pronounced in sectors that require extensive external financing, have few collateralizable assets or have limited access to trade credit.[9] Studies that use firm level data do not investigate the issue of the differential impact of tighter credit conditions on exporters of different sizes within an economy or

[7] In Arkolakis (2010) the elasticity of sales with respect to destination market wage is positive and decreasing in productivity. Thus, a negative shock to the destination market wage reduces the sales of less productive smaller exporters more than the sales of more productive larger exporters.

[8] See Rajan and Zingales (1998) for structural measures of financial dependence at a sectoral level.

[9] Also see Iacovone and Zavacka (2009) for sectoral analysis of exports during banking crisis. For other studies of credit and exports that employ different strategies to identify the transactions more vulnerable to financial shocks, see Ahn et al. (2011) and Berman et al. (2012).

within sectors in an economy. For instance, Bricongne et al. (2012) use firm level data from France on exports and firm level proxy for credit constraints to find that the overall impact of credit constraints on trade was limited. Paravisini et al. (2011) use matched firm-bank data from Peru to show that the exports of firms who were borrowing from banks with a higher level of foreign debt suffered. [10]

Bems et al. (2011b), Alessandria et al. (2010) and Levchenko et al. (2010) have emphasized the amplifying role of global production chains and inventory adjustment. However, they do not examine the margins of ajustment by size of exporters. Vertical specialization is important in the Mexcian context because a large fraction of Mexican exports to the U.S. is part of vertical supply chains - referred to as maquiladora exports. We find that big exporters whose export sales were characaterized by a high fraction of maquiladora exports suffered more during the crisis - lower survival probability and lower export growth - relative to similar sized firms with a lower fraction of maquiladora exports. This suggests that the relatively large exporters that were highly integrated into vertical supply chains had a limited ability to adjust during the crisis.

Out findings may be consistent with the relatively unexplored hypothesis that increased search for cheaper products induced a disproportionate decline of exports of higher-quality products if size is correlated with quality. Another mechanism may be that the big exporters match with big importers, and the credit shock in the U.S. affected the big importers more than the small importers. Thus, the big exporters of Mexico were affected more because of their importing partners.

The next section discusses the data and its basic features. This is followed, in section 3, by the decomposition of Mexican exports into intensive and extensive margin changes, ignoring the role of firm size. Section 4 discusses the intensive and extensive margin adjustment by firm size. In section 5, we juxtapose our findings with the theory for different factors that may have caused the crisis - demand collapse, credit constraints, and vertical supply chains. Section 6 concludes and discusses alternative hypotheses to explain our findings.

[10] Amiti and Weinstein (2011) use matched firm-bank data from Japan to show that banks transmitted financial shocks to exporters during the systemic crisis that plagued Japan in the 1990s.

2 Data

2.1 Source and Structure

The data we use for our analysis are administrative records of the Mexican customs agency on every transaction crossing the Mexican border. Prior to carrying out an international transaction, Mexican exporters and importers must fill out a customs form, called a pedimento aduanal in Spanish, on which they report the total value of the shipment (in US dollars), the products' tariff classification code[11], the price and the quantity of the products, the destination/origin country, as well as information on Mexican importers themselves such as to their name, tax payer id and address.

We use data from July 2004 to June 2010. From the original transaction-level data, we, first, aggregate up to monthly firm-product level exports and then cut monthly firm-product level exports whose value is less than 2000 USD in order to focus on not-one-time exporters.[12] Furthermore, we restrict the sample to exports to the U.S.. The U.S. accounted for more than 80 percent of Mexican exports during this period.[13] Then, the data is aggregated up to an yearly level. One year in our analysis starts with July of one year and ends in June of next year.[14]

The period 2007-08 to 2008-09 is the crisis period. We think of the three periods before the crisis period as 'normal', and use them as benchmarks for comparison. We will refer to

[11]The code is 8-digit and the first 6-digit is same as the HS code. There is a classification change in July 2007 due to the change in the HS from HS 2002 to HS 2007. We used the concordance between them to create a unified classification that can be applied to both before and after the classification change. The concordance to our own classification is available upon request. The results of our analysis do not change if we use the actual classification as the product category.

[12]This significantly reduces the number of exporter-product pairs, but none of the results of our analysis change if we use the whole sample. The U.S. custom also uses the cutoff of 2000 USD to distinguish between small and non-small shipment, and the latter type of shipment is examined with more care.

[13]We constructed our own exporter ID, taking into the misspelling of tax payer ID, name and address. The procedure is available from the authors. The results do not change if we use tax payer id as it is as the firm ID.

[14]We also conduct our analysis at a half yearly frequency. The first half (H1) of a year covers the months from January to June, and the second half (H2) of a year covers July to December. The results at half yearly frequency are consistent with the yearly results.

these as the pre-crisis periods. The period after the crisis period is the recovery period or the post-crisis period.

2.2 Basic Features

We start by presenting some basic features of the data. Table 1 shows the mean/median exports and mean/median products per exporter for every period. The gap between mean exports and median exports points to skewness in export sales. This skewness is also evident in the number of products per exporter. Exports were rising briskly in periods before the crisis, and then in the crisis period mean exports declined by about 37 percent while median exports declined by 32 percent. Exports did not recover fully by 2010. The effect of the crisis on products per exporter was not so drastic.

Table 1: Summary Statistics on Exports and Products

Period	Mean Export	Median Export	Products per exporter Mean	Products per exporter Median
2004-2005	14600000	170583	6	2
2005-2006	17900000	210557	6	2
2006-2007	22400000	308648	7	3
2007-2008	26400000	316448	7	3
2008-2009	19300000	216461	6	2
2009-2010	21500000	183620	6	2

Next, we examine the average exports, average number of products exported and average exports per exporter per product by size in Table 2, where size of an exporter is proxied by its total exports. In any period exporters are segmented by size decliles, 1 being the smallest 10 percent while 10 being the largest 10 percent. The numbers reveal a couple of interesting facts. First, the distribution of exports sales is highly skewed. The mean exports in the ninth decile are 5 percent of the mean exports in the top decile. Second, the average number of products exported per exporter rises with size, and also shows a high degree of skewness. The average number of products exported by exporters in the top decile are more than twice than that exported by those in the ninth decile. Third, average exports per exporter per product also increases with size, implying that exporters with larger sales also have larger sales per product. The skewness observed in average exports and average number of products per exporter is also evident in average exports per exporter per product.

Lastly, we look at the importance of multi-product exporters in Mexican exports. The

Table 2: Summary Statistics on Exports and Products by Size

Average Exports						
Decile	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
1	3651	3764	4072	4118	4063	3920
2	9443	10275	12165	12529	10970	10853
3	22248	24544	31053	34461	26770	26310
4	50253	57956	77671	84522	62944	56574
5	115328	139435	202569	209322	146591	124681
6	280269	344764	502121	510458	351616	303448
7	689469	867857	1239994	1313440	912973	804814
8	1961189	2444553	3488739	3614638	2630878	2300181
9	6936529	8449695	11200000	11800000	9129779	8454366
10	136000000	167000000	207000000	247000000	180000000	203000000
Average Number of Products per Exporter						
Decile	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
1	1	1	1	1	1	1
2	1	1	1	1	1	1
3	2	2	2	2	2	2
4	2	2	2	2	2	2
5	3	3	3	3	3	2
6	4	4	4	4	4	3
7	4	5	6	6	5	5
8	6	7	8	9	8	7
9	9	11	11	12	11	10
10	25	27	30	31	28	26
Average Exports per Exporter per Product						
Decile	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
1	3487	3618	3852	3925	3888	3727
2	7275	7881	8662	9059	8043	8187
3	14067	14300	17762	18635	15974	15456
4	25149	27175	33981	36422	29016	27608
5	44416	51551	59235	65709	51082	50283
6	78832	95300	115894	118925	96730	89843
7	157365	180406	213347	220752	185683	174145
8	317743	357220	419331	421302	347494	337498
9	731277	801357	980849	1022741	855158	863704
10	5394225	6288198	6963514	8066599	6397020	7864090

top panel of Table 3 shows the fraction of exporters who export a certain number of products. During the entire sample period - 2004 to 2010 - about 40 percent of exporters export only one product, 14 percent export two products. Thus about 54 percent of Mexican exporters sell one or two products. But, about 30 percent of Mexican exporters sell five or more products. This is consistent with the findings of Bernard et al. (2010) for US exporters. On the other hand, Iacovone and Javorcik (2008) using data for Mexico do not find support for this bipolar distribution. They, in fact, find that less than 10 percent of Mexican exporters

sell five or more products. The reason behind their finding is the 6-digit level of Mexican classification for productive activities as their product definition. We, on the other hand, use a more disaggregated 8-digit customs classification which is similar to what Bernard et al. (2010) use. Looking at the bottom panel of Table 3, it is evident that multi-product firms account for the bulk of Mexican exports, especially those who export more than 30 products. Exporters selling 5 or more products account for about 93 percent of Mexican exports. This is, again, in line with Bernard et al. (2010) but at odds with Iacovone and Javorcik (2008) for the reason highlighted above.

Table 3: Importance of Multi-Product Exporters

Percentage of Exporters						
Products Exported	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
1	41.55	40.38	36.39	36.10	40.15	41.92
2	14.80	14.05	13.35	13.57	14.72	15.10
3	9.01	8.84	8.59	8.66	8.24	8.62
4	5.63	5.81	6.27	6.34	5.56	5.50
5	4.42	4.65	5.02	5.12	4.59	4.51
6	3.43	3.47	3.58	3.40	3.21	3.04
7	2.64	2.35	2.92	3.08	2.85	2.81
8	2.13	2.41	2.66	2.62	2.42	2.11
9	2.01	2.11	2.27	2.57	1.86	1.72
10	1.59	1.67	2.10	1.57	1.53	1.47
11-20	7.47	8.26	9.64	9.94	8.57	7.46
21-30	2.46	2.78	3.42	2.90	2.97	2.63
> 30	2.87	3.22	3.79	4.12	3.34	3.13
Percentage of Total Value of Exports						
Products Exported	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010
1	1.09	1.03	0.69	0.61	1.07	1.45
2	1.53	1.06	0.75	0.95	1.25	1.48
3	1.74	1.03	0.82	1.04	1.86	3.20
4	1.82	1.08	1.10	0.88	1.38	1.34
5	1.16	1.61	1.13	0.87	1.51	1.65
6	1.55	0.99	1.36	0.72	1.03	1.11
7	1.54	1.38	1.17	1.24	1.30	1.47
8	1.41	1.25	1.40	1.02	1.96	1.42
9	1.54	1.48	1.53	1.11	1.29	1.40
10	1.77	1.20	1.18	1.44	1.70	0.96
11-20	12.64	11.96	11.99	12.95	12.08	11.19
21-30	9.75	10.88	23.07	22.41	9.92	19.46
> 30	62.45	65.06	53.80	54.74	63.65	53.88

3 Crisis and Margins of Adjustment

The effect of the crisis on the Mexican economy was quite severe. Between the second quarter of 2008 and the first quarter of 2009 real exports declined by 27 percent while real imports declined by 29 percent. Real GDP, on the other hand, declined by 11 percent.[15] Qualitatively, the Mexican economy behaved like the rest of the world - decline in trade was much larger than the decline in GDP. Quantitatively, the decline in both trade and GDP was much larger in Mexico than in its major trading partners in North America - Canada and United States -, and in the bigger Latin American economies like Chile and Brazil. Table 4 shows this comparison.

Table 4: International Comparison of Change in GDP, Total Exports, and Total Imports (millions of US $, volume estimates, fixed PPPs): Quarter 2, 2008 - Quarter 1, 2009

Country	GDP	Exports	Imports
Canada	−2%	−15%	−20%
Chile	−4%	−4%	−17%
Mexico	−8%	−23%	−25%
United States	−4%	−14%	−16%
Brazil	−3%	−19%	−21%

Source: OECD National Accounts

Figure 1 shows the merchandise exports and imports for Mexico from January 2006 to August 2010. The largest drop in both imports and exports took place between July 2008 and January 2009. During this period the value of exports fell by 45% whereas the value of imports fell by 42%.

3.1 Margins of Adjustment at Exporter Level

We start by looking at the margins of adjustment of Mexican exports at the level of individual exporters. Between any two time periods - t and $t-1$, we segment the total population of exporting firms into (a) stayers or survivors (those who are present in both time periods), (b) exiters (those who were present in $t-1$ but are not present in t, and (c) new entrants (those who are present in t but were not present in $t-1$). Thus the growth in exports can be written as

[15] Data are expressed in constant 2003 Mexican Pesos and come from the Sistema de Cuentas Nacionales de Mexico, Instituto Nacional de Estadtica y Geografia (INEGI).

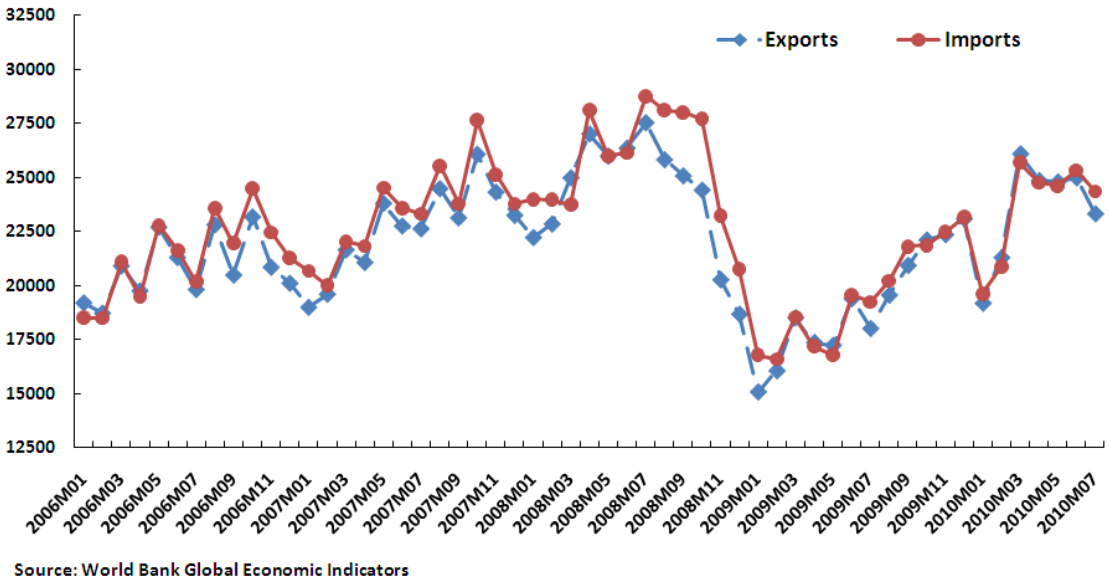

Figure 1: Merchandise exports and imports of Mexico (current US $, million)

$$\frac{X_t - X_{t-1}}{X_{t-1}} = \underbrace{\sum_{i \in \Omega_{t-1} \bigcap \Omega_t} \frac{X_{i,t} - X_{i,t-1}}{X_{t-1}}}_{\text{intensive margin}} + \underbrace{\sum_{i \in \Omega_t, i \notin \Omega_{t-1}} \frac{X_{i,t}}{X_{t-1}} - \sum_{i \in \Omega_{t-1}, i \notin \Omega_t} \frac{X_{i,t-1}}{X_{t-1}}}_{\text{extensive margin}}, \tag{3.1}$$

where $X_{i,t}$ is exports of firm i at time t, Ω_t is the total number of exporting firms at time t, and $X_t = \sum_{i \in \Omega_t} X_{i,t}$ is the total exports at time t. The change in total exports due to stayers (first term on the right-hand side) is termed as intensive margin, while the change in exports coming from new entrants and exiters (sum of second and third term on the right-hand side) is termed as extensive margin.

Table 5 shows the contributions of each these margins. Intensive margin accounts for most of the growth in exports in all periods, whereas extensive margin (entry plus exit in the table) is a relatively small fraction of total export growth. The decline in exports during the crisis period is primarily due to the significant reduction in intensive margin of exports. There are studies on other countries' exports that exploit firm-product level data and arrive at the same conclusion - Bricongne et al. (2012) for France, and Behrens et al. (Forthcoming) for Belgium. However, they do not look at the recovery period. Our data shows that resumption of positive growth in exports in the recovery period is driven by the large positive contribution of intensive margin. Again, the contribution of extensive margin

is relatively negligible.

Table 5: Extensive and intensive margin of exports: firm level (in percent)

Type of firm	2004/05-2005/06	2005/06-2006/07	2006/07-2007/08	2007/08-2008/09	2008/09-2009/10
Stayers	13.09	9.18	10.23	-18.69	7.66
Exiters	-1.74	-1.27	-0.50	-0.49	-0.59
New Entrants	0.89	1.14	1.09	1.68	1.39
Entry plus Exit	-0.85	-0.13	0.58	1.19	0.80
Growth in Exports	12.24	9.05	10.81	-17.50	8.46

Table 6 shows how large is the number of new entrants, exiters and stayers between two years relative to the total number of exporting firms in the initial year. About 70 percent of the firms in any period survive to the next time period, and about 30 percent cease to be exporters. However, the exits are offset by the new entrants. Note that compared to the pre-crisis periods the fraction of stayers does not decline (or the fraction of exits does not increase) during the crisis period. In fact, what we see is a slight increase in net entry during the crisis period as well as in the recovery period. Overall, there is no significant change in the entry, exit, and survival pattern of firms during the crisis and recovery period as compared to the pre-crisis periods.

Table 6: Stayers, exiters and entrants relative to initial population of exporting firms

Type of firm	2004/05-2005/06	2005/06-2006/07	2006/07-2007/08	2007/08-2008/09	2008/09-2009/10
Stayers	0.68	0.66	0.72	0.75	0.72
Exiters	0.32	0.34	0.28	0.25	0.28
New Entrants	0.27	0.21	0.28	0.37	0.33
Entry minus Exit	-0.05	-0.13	0.00	0.12	0.06

3.2 Margins of Adjustment at Exporter-Product Level

The analysis so far shows that almost all of the adjustment in exports of Mexico during the crisis period happened at the intensive margin, i.e. changes in the value of exports of the continuing firms explains bulk of the changes in aggregate exports. However, for multi-product firms this intensive margin adjustment may capture extensive margin adjustment by firms at the product level. Thus, a part of the change in value of exports for a firm may be due to adjustment in the product scope (change in the number of products) by the firm. Our data allows us to disentagle the effect of product scope adjustment from that of pure

intensive margin adjustment on export volume. So, now change in the value of exports can be written as

$$\frac{X_t - X_{t-1}}{X_{t-1}} = \underbrace{\sum_{i \in \Omega_{t-1} \bigcap \Omega_t} \sum_{p \in \Psi_{i,t-1} \bigcap \Psi_{i,t}} \frac{X_{p,i,t} - X_{p,i,t-1}}{X_{t-1}}}_{\text{sub-intensive margin}} + \underbrace{\sum_{i \in \Omega_{t-1} \bigcap \Omega_t} \left[\sum_{p \in \Psi_{i,t}, p \notin \Psi_{i,t-1}} \frac{X_{p,i,t}}{X_{t-1}} - \sum_{p \in \Psi_{i,t-1}, p \notin \Psi_{i,t}} \frac{X_{p,i,t-1}}{X_{t-1}} \right]}_{\text{sub-extensive margin}} + \underbrace{\sum_{i \in \Omega_t, i \notin \Omega_{t-1}} \frac{X_{i,t}}{X_{t-1}} - \sum_{i \in \Omega_{t-1}, i \notin \Omega_t} \frac{X_{i,t-1}}{X_{t-1}}}_{\text{extensive margin}}, \tag{3.2}$$

where p stands for product and $\Psi_{i,t}$ is the set of products exported by firm i at time t.

Now the intensive margin is decomposed into two components. First, changes in trade volume for continuing products (stayers); this is called the sub-intensive margin and it is the first term on the right-hand side in the equation above. The second component is the sum of the second and third term in square bracket - changes in trade volume brought about due to the adding (new entrants) and dropping (exiters) of products by continuing exporters. This captures the effect of changes in product scope of continuing exporters on the export volume. Note that changes in extensive margin also involves products, but exit of a firm will imply exit of all the products it exports, and similarly entry of a new firm will imply entry of all products that it exports. Therefore, extensive margin changes are only expressed at the firm level. This also reflects the fact that the firm makes the decisions to enter/exit/stay as well as which products to export.

Table 7 shows the decomposition in (3.2). Since this decomposition only affects the intensive margin component of the firm level decomposition in (3.1), the rows for firms that are exiters and new entrants show the same growth rates as in table 5. The changes are seen for continuing firms or the stayers. The row for 'All' products simply gives us the intensive margin adjustment of (3.1). This is then broken down into sub-intensive margin and sub-extensive margin. The sub-intensive margin is the pure intensive margin adjustment resulting from changes in export value of continuing products of continuing firms. This is

reflected in the numbers for the combination of stayer firms and stayer products. The sub-extenisve margin is sum of two combinations - stayer firms and new entrant products and stayer firms and exiter products. This is shown in the row for 'Entry plus Exit'. Comparing the two, we find that the decline in exports during the crisis period was largely due to the decline in sub-intensive margin. The pre-crisis periods also show the same picture, though in a positive direction. Again, the growth in exports in the recovery period is due to the growth in the sub-intensive margin. The effect of changes in product scope of firms does not have a significant impact on aggregate exports in any period.

Table 7: Extensive and intensive margin of exports: firm and product level (in percent)

Type of firm	Type of Product	2004/05-2005/06	2005/06-2006/07	2006/07-2007/08	2007/08-2008/09	2008/09-2009/10
Stayer	All	13.09	9.18	10.23	-18.69	7.66
	Stayers	12.11	8.22	6.70	-16.43	8.05
	Exiters	-2.73	-1.99	-2.80	-4.18	-2.93
	New Entrants	3.71	2.95	6.33	1.92	2.54
	Entry plus Exit	0.98	0.96	3.53	-2.27	-0.39
Exiters	Exiters	-1.74	-1.27	-0.50	-0.49	-0.59
New Entrants	New Entrants	0.89	1.14	1.09	1.68	1.39
Growth in Exports		12.24	9.05	10.81	-17.50	8.46

In Table 8 we look at the decomposition in terms of number of exporting firms and their products expressed as a ratio of the number of firm-product observations in the initial period. Table 8 shows that relative to the initial number of firm-product combinations (i) 54 percent survive to the next period, (ii) 42 percent are attributable to dropping of products by continuing firms, (iii) and 3 to 6 percent are attributable to exit of firms (and their products). However, the products dropped by continuing firms are completely offset by addition of new products. Similarly, the exits of firms are offset by entry of new firms. Thus, even with the inclusion of product scope the entry, exit, and survival pattern of firms and their products does not change during the crisis and the recovery period relative to the pre-crisis period.

Table 8: Entry and exit patterns of exporting firms and products relative to initial population of firms and products

Type of firm	Type of Product	2004/05-2005/06	2005/06-2006/07	2006/07-2007/08	2007/08-2008/09	2008/09-2009/10
Stayer	Stayers	0.53	0.53	0.54	0.53	0.55
	Exiters	0.41	0.41	0.42	0.43	0.44
	New Entrants	0.43	0.43	0.45	0.42	0.40

Table 8: (continued)

Type of firm	Type of Product	2004/05-2005/06	2005/06-2006/07	2006/07-2007/08	2007/08-2008/09	2008/09-2009/10
Exiters	Exiters	0.05	0.06	0.04	0.03	0.04
New Entrants	New Entrants	0.05	0.03	0.04	0.05	0.05

4 Differences in Adjustment Margins by Size of Exporter

Our analysis so far confirms the basic finding of many studies regarding the trade adjustment in the 2008 crisis - decline in trade was driven by intensive margin adjustment. The growth in intensive margin during the recovery period bolsters the importance of intensive margin adjustment further. However, the literature has not investigated if the dominance of intensive margin adjustment holds when one looks at exporters of different types. To be specific, in this section we investigate whether exporters of different sizes adjusted differently during the crisis period as compared to pre-crisis amd post-crisis period.

We focus on (i) probability of firm exit, (ii) probability of (net) product addition, and (iii) growth in sales during the pre-crisis, crisis and post-crisis periods for firms of different sizes. Recent literature on firm level heterogeneity and trade finds evidence that more productive firms self-select into becoming exporters, and they are bigger in size - have greater export sales and employment.[16] Chaney (2008) and Bernard et al. (2003) show that models with firm level heterogeneity in productivity, fixed costs of exporting, and variable iceberg costs of exporting can replicate the size distribution of firms very well. Since we do not have data on firm characterestics like output and employment, value of exports of a firm in year $t-1$ is taken as a proxy for size of the firm for a given period.

4.1 Firm Exit

Figure 2 shows the exit probabilities by firm size for the three pre-crisis periods, the crisis period and the post-crisis period. The first thing to note is that for every period the exit probaility is declining in size of the firm. This is consistent with models of trade that emphasize that more producitive larger firms are able to pay the sunk costs of entry into export markets and remain profitable. Therefore, they face a lower probabilty of exit. Com-

[16] See Clerides et al. (1998) (for Mexico, Colombia and Morocco), Bernard and Jensen (1999) (for U.S.), and Aw et al. (2000) (for Taiwan and Korea).

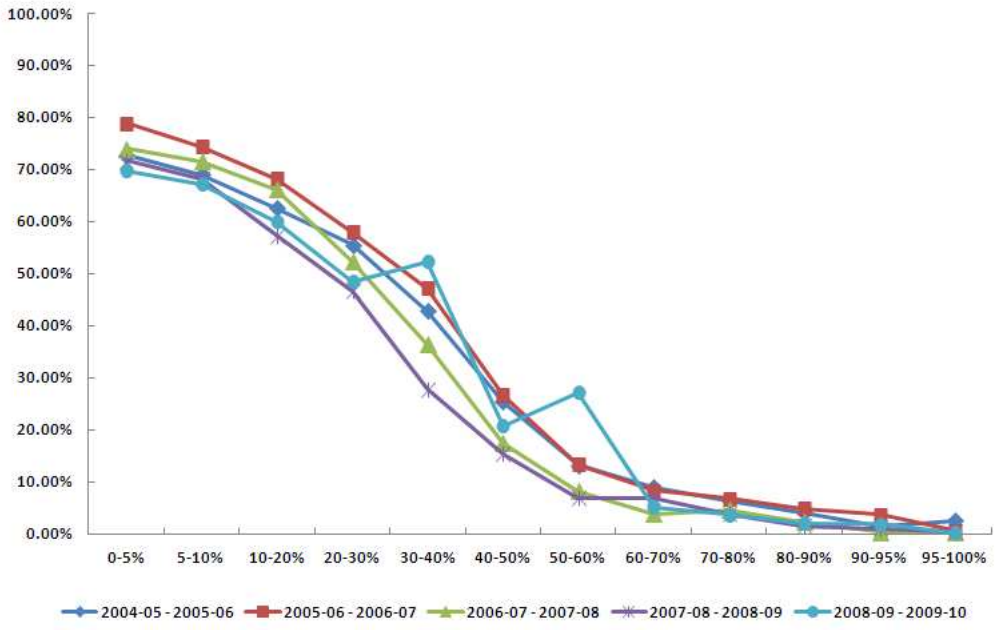

Figure 2: Probability of Firm Exit by Size

paring the exit probabilities across differet time periods, we find that firm exit probabilities did not exhibit any significant change during the crisis period as compared to pre and post-crisis periods for any size category. In particular, the exit probabilities for smaller firms do not increase during the crisis period.

In order to control for industry specific effects and their interaction with firm size we use the following parsimonious econometric specification

$$E_{ijt,t-1} = \beta_0 + \sum_{1}^{9} \beta_k k_{th}\, Decile_{ijt-1} + \mu_j + \epsilon_{ijt} \quad , \tag{4.1}$$

where where i, j and t index exporters, industries (HS 2 chapter), and years, respectively; E_{ijt} the dummy for exit; $k-th\ Decile_{ij}$ is a dummy variable indicating whether firm i's export revenue in industry j is in the k-th decile within industry j; and μ_j is an industry fixed effect.[17] The omitted category for $k-th\ Decile_{ij}$ is the last decile: the top 10 percent exporters. Therefore, β_k reveals exit probability of the exporters in the k-th decile compared to the top decile of exporters within industries.

Table 10 (in the Appendix) shows the result for exporters' exit from the U.S. market. Each column shows the result from the same regression but for a different period. Columns

[17]This means that firms may not necessarily be exiting altogether from the U.S. market in case firms export in more than one HS chapter.

(1)(2)(3), which correspond to the results from the three pre-crisis periods, show that the coefficient on k_{th} decile (bottom $k*10\%$ exporters) is higher than that of $k+1_{th}$ decile. This suggests the exit probability is monotonically decreasing in the size within industries.[18] The pattern is similar across all three periods. Does the trade crisis make smaller exporters even more likely to exit from the export market? Column (4) shows the result for the trade crisis period. The comparison between Column (4) and other columns suggests that the patterns are remarkably similar for these two types of the period. Column (5) shows the result for the recovery period, which again looks similar. The trade crisis, therefore, did not make smaller exporters more likely to exit from the export market as compared to the pre and post-crisis periods.

4.2 Export Growth

Now, we analyze the growth in exports of firms of different sizes between two years in a period. Table 9 shows the exports in year t relative to year $t-1$ by size (in year $t-1$) for the three pre-crisis periods, the crisis period and the post-crisis period. Growth in exports is declining in size in all time periods. What stands out is the performance of firms of different sizes during the crisis period. The smaller firms - bottom 60 percent - continued to expand their exports even during the crisis while the effect of the crisis is seen largely on the top 40 percent firms. Even among these firms the brunt of the crisis is felt by the top 10 percent exporters whose sales declined by 21 percent. This implies that the decline in Mexican exports to the United States was due to decline in exports of the largest 10 percent exporters.

We test this finding using the more robust econometric specification

$$\ln X_{ij,t} - \ln X_{ij,t-1} = \beta_0 + \sum_{1}^{9} \beta_k k_{th}\, Decile_{ijt-1} + \mu_j + \epsilon_{ijt} \quad . \tag{4.2}$$

$X_{ij,t}$ is the value of exports of firm i in industry j at time t. Table 11 shows the result for the change in the log of exports. Since this variable is defined for only those exporter-industry pairs that survived, the analysis shows that how exporters of different initial relative size grow conditional on survival. Columns (1)(2)(3) reveal an interesting pattern: (i) Smallest

[18] This is also consistent with the literature on industry dynamics. For example, see Klette and Kortum (2004).

Table 9: Growth in Exports by Export Percentiles in period $t-1$

Size(t-1)	$Exports(t)/Exports(t-1)$				
	2004/05-2005/06	2005/06-2006/07	2006/07-2007/08	2007/08-2008/09	2008/09-2009/10
0-20	33.52	8.50	21.55	11.02	10.85
20-40	4.92	2.02	2.99	2.51	6.94
40-60	1.46	1.42	2.33	1.27	1.39
60-80	1.22	1.06	1.76	1.00	1.12
80-90	1.09	1.08	1.07	0.98	1.02
90-100	1.10	1.07	1.06	0.79	1.07

exporters are growing at the highest rate; (ii) the growth rate is decreasing in size up to the 7th-9th deciles; (iii) but exporters in the 10th decile (top 10 percent exporters) have a higher growth rate than those next-to-top level exporters. Findings (i)(ii) are consistent again with any model of firm size distribution, but (iii) is not. For example, stylized fact 8 of Klette and Kortum (2004) says "Smaller firms have a lower probability of survival, but those that survive tend to grow faster than larger firms. Among larger firms, growth rates are unrelated to past growth or to firm size". Arkolakis (2010), on the other hand, predicts a monotonically declining relationship between firm productivity and export growth. Why does export growth exhibit this pattern in normal years is left to future research.[19]

Does the trade crisis reduce smaller exporters' export growth? Column (4) shows the result for the crisis period. The comparison between Column (4) and other columns again suggests that patterns (i)(ii) are similar. We see a weaker pattern for (iii): during the crisis period there is no statistically significant difference between the performance of the top 10 percent exporters and the top 20-30 percent exporters. Column (5) shows the results for the post-crisis period, and suggests that the pattern goes back completely to the pre-crisis period. If anything, during the crisis, the growth rate of exports for smaller exporters (bottom 60 percent) relative to exporters in the top decile became slightly higher.

[19]The analysis by Sutton (2007) on persistence of leadership may provide a possible framework.

4.3 Likelihood of Product Addition

Next, we examine the likelihood of (net) product addition by exporters. The econometeric specification is

$$P_{ijt,t-1} = \beta_0 + \sum_{1}^{9} \beta_k k_{th}\, Decile_{ijt-1} + \mu_j + \epsilon_{ijt} \quad , \tag{4.3}$$

where P_{ijt} the dummy for an increase in the number of products exported. The results are shown in Table 12 (in the Appendix). Columns (1)(2)(3) show that the probability that exporters add new products within the same industry is monotonically increasing in the size in the pre-crisis periods. Does the trade crisis make smaller exporters even less likely to add new products in their export market? Column (4) shows the result for the trade crisis period, and Column (5) shows the result for the recovery period. The comparison between Column (4) and other columns suggests that the patterns are remarkably similar across different periods. The trade crisis did not make smaller exporters less likely to expand their product lines.

4.4 Decomposition of Change in Exports by Size

In this section we carry out the decomposition of (3.2) by size, but abstracting from entry of firms. The objective is to assess the contribution of firm exit, product adding and dropping, and sub-itenisve margin in the total change in exports for firms in different size categories. Starting with the initial year in a given period, each firm can adjust in the following ways: (i) firm could stop exporting (firm exit), (ii) firm continues to export but adds/drops products (sub-extensive margin), and (iii) firm continues to export the same products but experiences an increase/decrease in its exports (sub-intensive margin). Figure 3 plots the share of the three margins in the change in total exports by size percentiles.

The patterns for the pre-crisis periods show that the share of sub-extensive margin as compared to sub-intensive margin is higher for smaller firms (less than median size) than bigger firms. The share of intensive margin increases with size but tapers off slightly for the largest exporters. The share of firm exit does not show a consistent pattern, except that it is higher for firms that fall between the 50th to the 90th percentile of the size distribution.

During the crisis period there is no significant change in the behavior of the smaller

Figure 3: Margins of Adjustment by Size

firms. However, for firms that fall in the size categories greater than 60th percentile, there is a marked increase in the contribution of firm exit as well as that of sub-extensive margin. The contribution of sub-extensive margin is negative, implying that the larger firms saw a decline in exports due to net dropping of products. However, for the largest size category the shares of firm exit and sub-extensive margin are similar to those observed in the pre-crisis periods. For these firms the crucial difference is that the share of sub-intensive margin is as large as in the pre-crisis periods, but negative. The same change in sub-intensive margin contribution is seen for the second largest size category.

During the recovery period, the shares of the three margins for firms of different sizes

seem to have returned to the pre-crisis pattern, with two noticeable differences. As compared to the pre-crisis periods (i) the share of sub-intensive margin is higher for almost every size percentile, and (ii) firm exit and negative contribution of sub-extensive margin still seem to be higher for the firms between the 80th to 95 percentiles.

Overall, underneath the familiar conclusion that intensive margin changes drove the collapse in trade during the 2008 crisis, we find a significant heterogeneity in the importance of the three margins of adjustment across exporters of different sizes.

5 Performance of Big versus Small Exporters in Workhorse Models of Trade

To summarize, we find that the crisis did not make smaller exporters more likely to exit, grow less, or expand less their product line. Firm exit probability is decreasing in size in all periods, and small firms' exit probability (relative to large firms) does not increase during the crisis period. Smaller firms' exports grow faster than those of the larger firms, and this pattern is stable during the crisis; it is only the large exporters who suffer a contraction in exports during the crisis period. The likelihood of increasing the number of products exported is increasing in firm size in all periods, and relative to the top decile this probability during the crisis is no different from that in the pre-crisis and post-crisis period.

Patterns of pre-crisis and post-crisis correlations of firm size with firm exit, growth in exports and products line expansion is consistent with the a large body of work. Decreasing exit probabality with size of exporters is consistent with the self selection of more productive firms into becoming exporters by paying a sunk cost of entry into foreign markets - Melitz (2003), Chaney (2008) and Bernard et al. (2003). Faster growth of exports for smaller exporters is consistent with Arkolakis (2010), wherein the fixed cost of exporting is replaced with an increasing marginal costs of reaching additional consumers in destination markets (advertising costs). Smaller firms decide to reach fewer consumers, but a decline in trade costs or an increase in destination market size allows them to add additional consumers at lower marginal costs than larger firms. Lastly, the increase in the likelihood of adding products with firm size can be generated in a multi-product generalization of the Melitz framework - Bernard et al. (2011) and Bernard et al. (2010). In these frameworks larger

more productive firms can profitably export more number of products.

In what follows we examine the implications of the trade crisis for the performance of small versus big exporters, within this class of new trade models that feature firm level heterogeneity in productivity. We consider three main factors that have been highlighted in the literature as the main causes of the trade crisis - demand collapse, credit constraints, and vertical specialization. The question we ask is - does the main mechanism - reallocation of resources (and market shares) across firms with different productivity levels - that generates the correct pre and post-crisis correlations between firm size and margins of adjustment also predict the correlations consistent with the data during the crisis.

5.1 Demand Collapse

A decline in foreign demand would cause cut-off productivity level to rise. The least productive smaller firms are closest to cut-off productivity level, and therefore, are most likely to exit the market altogether. Larger, more productive, firms are more likely to survive by contracting profit margins. Thus, the survival porbabilities of smaller exporters relative to larger exporters should fall. A decline in foreign demand reduces export sales (conditional on survivial). In Arkolakis (2010), the elasticity of sales with respect to foreign wage is decreasing in productivity, implying that less productive smaller exporters suffer greater decline in sales than the more productive larger exporters.

Most of the literature on trade crisis has considered the implications of an aggregate demand shock. And, as explained above, models with firm level heterogeneity in productivity and an aggregate demand shock as the cause of trade collapse will not be consistent with our findings. In fact, our results hold even after controlling for industry fixed effects, i.e. larger exporters perform worse than smaller exporters within each industry. Thus, incorporating heterogeneity in demand shock across industries, as in Eaton et al. (2010), is not going to be sufficient to explain this.

5.2 Credit Constraints

The interaction between credit constraints and firm heterogeneity is also going to cause the smaller and less productive firms to be more affected by credit restrictions as a result of their size or lack of sufficient collateral and/or credit guarantees (Greenaway et al. (2007),

Muuls (2008)). Therefore, they are less likely to survive in tighter credit conditions. The interaction between credit constraints and firm heterogeneity also sharpens the reallocation of market shares from the least productive (and hence smaller) firms to the most productive (and larger) exporters - Manova (2008). Hence, smaller firms should experience a greater decline in sales.

Again, as in the case of demand shock, the existing literature on the importance of credit shock in driving the trade crisis is primarily focused on aggregate implications of a credit shock. For instance, Paravisini et al. (2011) use matched firm-bank data from Peru, and find that exports of firms who borrowed from banks with a higher level of foreign debt suffered. Chor and Manova (2012), using data on monthly US imports, find that countries with higher inter-bank rates (tighter credit conditions) exported less to the U.S. These effects were exacerbated during the crisis and especially pronounced in sectors that require extensive external financing, have few collateralizable assets or have limited access to trade credit. However, both papers are silent on the issue of the differential impact of tighter credit conditions on exporters of different sizes within an economy or within sectors in an economy.

5.3 Vertical Supply Chains

According to Bems et al. (2011a) vertical specialization trade fell by more than value-added trade (12.9 percent versus 10.3 percent).[20] A large fraction of exports from Mexico to the U.S. is part of vertical supply chains - often referred to as maquiladora exports. Our data allow us to classify exports, at the firm-product level, into processed versus non-processed.[21] Given the importance of maquiladora exports in Mexico's total exports and the high likelihood of these being part of vertical supply chains, we investigate whether firm exit, net product addition, and sub-intensive margin growth behaved differently for maquila versus non-maquila exporters. We adopt the the following specification

$$Y_{ijt} = \beta_0 + \sum_{1}^{9} \beta_k k_{th}\, Decile_{ijt-1} + \sum_{1}^{9} \beta_k k_{th}\, Decile_{ijt-1} * \text{Maquila export ratio}_{ijt-1} + \mu_j + \epsilon_{ijt} \quad , \tag{5.1}$$

[20] Because declines in demand were largest in more vertically specialized sectors.

[21] Processing includes maquila exports as well as re-exports of temporary imports.

where i, j and t index exporters, industries, and years, respectively; Y_{ijt} can be (i) the change in the log of exports between two periods, (ii) the dummy for exit of the exporter, or (iii) the dummy for an increase in the number of products exported. So, now, we have included interaction terms of each decile dummy with the maquiladora ratio. Maquiladora ratio is defined as the fraction of each firm's total exports classified as processed within a HS2 industry. The omitted category is again the tenth decile dummy. The coefficients on the interaction terms capture the extent to which maquiladora export dependent exporters in a given decile are performing differently as compared to all exporters in the tenth decile.

The results for the three margins of adjustment are shown in Tables 13, 14, and 15, respectively.

Table 13 shows that for most deciles the coefficients on the interaction of decile dummies and maquiladora ratio are positive but not statistically significant. The final rows show that top 10 percent exporters that have a higher maquila ratio are always statistically significantly less likely to exit in the pre-crisis periods and the recovery period. However, this pattern disappears in the crisis period. This suggests that the among the exporters in the top decile those with greater dependence on maquila exports suffered more. Table 14 shows that top 10 percent exporters with high dependence on maquila exports were no different from top 10 percent exporters with no maquila exports in pre-crisis and post-crisis periods, but grew 18 percent less than the top 10 percent exporters with no maquila exports during the crisis period. Table 15 does not reveal any discernable pattern differences between maquila and non-maquila exporters with respect to net product addition.

Thus, big exporters whose export sales were characaterized by a high fraction of maquiladora exports suffered more during the crisis - in terms of survial probability and export growth - relative to similar sized firms with a lower fraction of maquiladora exports. This suggests that the relatively large exporters that were highly integrated into vertical supply chains had a limited ability to adjust during the crisis. Anecdotal evidence supports this finding. For instance, Mexican exporters in the auto parts industry had been particularly badly hit during the crisis because of the industry's operations being predominantly based on direct and indirect exports to the U.S., where the big three auto manufacturing

firms - General Motor, Ford and Chrysler - were worst hit.[22]

6 Conclusions

Comparison of the behavior of margins of adjustment - firm exit, product addition, and sub-intensive margin - for firms of different sizes during the crisis period with that in the pre-crisis and post-crisis period reveals that small exporters were not affected much by the crisis and it was only the large exporters who bore the brunt of the crisis. This finding is not consistent with the current workhorse models of trade that feature firm level heterogeneity in productivity and aggregate or sectoral demand/credit shocks.

On the other hand, we find evidence to support the hypothesis that vertical production chains amplified the export decline in Mexico, as bigger exporters are more likely to be part of global production chains through maquiladora exports.

Though our findings are inconsistent with the predictions of workhorse models of trade, they may be consistent with the relatively unexplored hypothesis that increased search for cheaper products induced a disproportionate decline of exports of higher-quality products. Levchenko et al. (2011) find little evidence on this hypothesis, but they do not analyze within-country firm heterogeneity. Gopinath et al. (2011) find that that differentiated manufactures exhibited marked stability in their trade prices while non-differentiated manufactures experienced a sharp reduction in their prices. If size is correlated with quality, using information on prices and distinguishing between differentiated and non-differentiated sectors may reveal the importance of this channel.[23] We are currently exploring this hypothesis. Another potential mechanism that we are exploring is that the big exporters match with big importers, and the credit shock in the U.S. affected the big importers more than the small importers. Thus, the big exporters of Mexico were affected more because of their importing partners.

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7 Appendix

Table 10: Regression (Probit analysis) of exit on relative size of exporters

	(1)	(2)	(3)	(4)	(5)
Dependent Variable			Exit in the next period		
Initial Period	2004July-2005June	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June
Final Period	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June	2009July-2010June
Type of Period	Normal	Normal	Normal	Crisis	Recovery
1st Decile	0.71***	0.72***	0.74***	0.72***	0.73***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2nd Decile	0.69***	0.69***	0.71***	0.69***	0.70***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
3rd Decile	0.65***	0.65***	0.68***	0.64***	0.67***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
4th Decile	0.60***	0.59***	0.62***	0.58***	0.61***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
5th Decile	0.56***	0.55***	0.55***	0.52***	0.55***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
6th Decile	0.46***	0.45***	0.46***	0.42***	0.48***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
7th Decile	0.37***	0.36***	0.35***	0.34***	0.39***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
8th Decile	0.26***	0.26***	0.26***	0.25***	0.27***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
9th Decile	0.14***	0.13***	0.15***	0.13***	0.16***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
R^2					
N	28654	28732	28074	28563	28851

Notes: The table reports coefficients on decile dummies from exporter-industry-level probit analysis of the exit from U.S. market on these decile dummies, industry fixed effects. The omitted category is the 10th decile, so each coefficient reveals the relative performance of the exporters in the k-th compared to the top 10% exporters within industries. Robust standard errors in parentheses. Significance: * 10 percent, ** 5 percent, *** 1 percent.

Table 11: Regressions of export volume changes on relative size of exporters

	(1)	(2)	(3)	(4)	(5)
Dependent Variable			$\triangle \log Exports$		
Initial Period	2004July-2005June	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June
Final Period	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June	2009July-2010June
Type of Period	Normal	Normal	Normal	Crisis	Recovery
1st Decile	1.66***	1.62***	1.72***	1.85***	1.66***
	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)
2nd Decile	1.14***	1.12***	1.09***	1.19***	1.11***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
3rd Decile	0.71***	0.60***	0.68***	0.69***	0.73***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
4th Decile	0.41***	0.40***	0.42***	0.49***	0.37***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
5th Decile	0.18***	0.15***	0.15***	0.18***	0.18***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
6th Decile	0.05	-0.01	0.00	0.09**	0.03
	(0.04)	(0.03)	(0.03)	(0.04)	(0.03)
7th Decile	-0.03	-0.02	-0.06*	-0.02	-0.09***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
8th Decile	-0.12***	-0.08***	-0.07**	-0.04	-0.06**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
9th Decile	-0.07**	-0.09***	-0.07**	-0.02	-0.06*
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
R^2	0.12	0.12	0.12	0.13	0.12
N	18542	18501	18615	18665	18717

Notes: The table reports coefficients on decile dummies from exporter-industry-level regressions of the changes in the log of exports on these decile dummies, industry fixed effects. The omitted category is the 10th decile, so each coefficient reveals the relative performance of the exporters in the k-th compared to the top 10% exporters within industries, conditional on survival. Robust standard errors in parentheses. Significance: * 10 percent, ** 5 percent, *** 1 percent.

Table 12: Regression (Probit analysis) of expansion of number of products on relative size of exporters

	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Increase in the number of products				
Initial Period	2004July-2005June	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June
Final Period	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June	2009July-2010June
Type of Period	Normal	Normal	Normal	Crisis	Recovery
1st Decile	-0.13***	-0.13***	-0.13***	-0.12***	-0.12***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
2nd Decile	-0.12***	-0.12***	-0.13***	-0.12***	-0.11***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
3rd Decile	-0.12***	-0.12***	-0.12***	-0.11***	-0.10***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
4th Decile	-0.11***	-0.10***	-0.11***	-0.10***	-0.09***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
5th Decile	-0.10***	-0.09***	-0.10***	-0.09***	-0.08***
	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)
6th Decile	-0.08***	-0.08***	-0.09***	-0.07***	-0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
7th Decile	-0.07***	-0.06***	-0.06***	-0.07***	-0.06***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
8th Decile	-0.05***	-0.06***	-0.04***	-0.05***	-0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
9th Decile	-0.03***	-0.03***	-0.03***	-0.03***	-0.03***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
R^2					
N	28514	28691	27957	28341	28583

Notes: The table reports coefficients on decile dummies from exporter-industry-level probit analysis of the expansion of the number of products on these decile dummies, industry fixed effects. The omitted category is the 10th decile, so each coefficient reveals the relative performance of the exporters in the k-th compared to the top 10% exporters within industries. Robust standard errors in parentheses. Significance: * 10 percent, ** 5 percent, *** 1 percent.

Table 13: Regression (Probit analysis) of exit on relative size of exporters: Maquila versus non-Maquila

	(1)	(2)	(3)	(4)	(5)
Dependent Variable			Exit in the next period		
Initial Period	2004July-2005June	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June
Final Period	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June	2009July-2010June
Type of Period	Normal	Normal	Normal	Crisis	Recovery
1st Decile (d)	0.70***	0.70***	0.71***	0.71***	0.72***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
2nd Decile (d)	0.67***	0.68***	0.68***	0.68***	0.69***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
3rd Decile (d)	0.63***	0.63***	0.64***	0.64***	0.65***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
4th Decile (d)	0.58***	0.56***	0.57***	0.58***	0.59***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
5th Decile (d)	0.51***	0.51***	0.49***	0.51***	0.53***
	(0.03)	(0.02)	(0.03)	(0.02)	(0.02)
6th Decile (d)	0.44***	0.41***	0.40***	0.40***	0.45***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
7th Decile (d)	0.32***	0.32***	0.29***	0.30***	0.37***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.02)
8th Decile (d)	0.22***	0.21***	0.19***	0.24***	0.24***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
9th Decile (d)	0.12***	0.10***	0.10***	0.12***	0.14***
	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)
1st Decile*Maquila Ratio (d)	0.03	0.01	0.07*	-0.02	0.02
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
2nd Decile*Maquila Ratio	0.06	0.05	0.03	0.02	0.04
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
3rd Decile*Maquila Ratio	0.05	0.03	0.08**	-0.00	0.05
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
4th Decile*Maquila Ratio	0.03	0.04	0.07*	-0.01	0.07*
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
5th Decile*Maquila Ratio	0.08**	0.06	0.07*	0.00	0.04
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
6th Decile*Maquila Ratio	0.02	0.04	0.06	0.01	0.05
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
7th Decile*Maquila Ratio	0.06	0.04	0.09**	0.05	0.00
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
8th Decile*Maquila Ratio	0.06	0.07*	0.09**	0.01	0.06
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
9th Decile*Maquila Ratio	0.03	0.05	0.06	0.00	0.04
	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)
Maquila Ratio	-0.09**	-0.10***	-0.12***	-0.04	-0.09***
	(0.03)	(0.03)	(0.04)	(0.04)	(0.03)
N	28716	28791	28127	28635	28926

Notes:

Table 14: Regressions of export volume changes on relative size of exporters: Maquila versus Non-Maquila

	(1)	(2)	(3)	(4)	(5)
Dependent Variable			$\triangle \log Exports$		
Initial Period	2004July-2005June	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June
Final Period	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June	2009July-2010June
Type of Period	Normal	Normal	Normal	Crisis	Recovery
1st Decile	1.60***	1.60***	1.63***	1.81***	1.59***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.06)
2nd Decile	0.95***	1.05***	1.05***	1.01***	1.08***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)
3rd Decile	0.61***	0.57***	0.55***	0.55***	0.70***
	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)
4th Decile	0.31***	0.39***	0.39***	0.35***	0.35***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
5th Decile	0.13***	0.15***	0.08	0.09*	0.15***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
6th Decile	-0.02	-0.01	-0.07	-0.02	0.00
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
7th Decile	-0.07	-0.02	-0.12**	-0.09*	-0.10**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
8th Decile	-0.19***	-0.11**	-0.11**	-0.06	-0.07*
	(0.05)	(0.05)	(0.05)	(0.05)	(0.04)
9th Decile	-0.11**	-0.09**	-0.10**	-0.07	-0.03
	(0.05)	(0.05)	(0.05)	(0.04)	(0.04)
1st Decile*Maquila Ratio	0.24*	0.24*	0.23*	-0.11	0.24*
	(0.13)	(0.12)	(0.14)	(0.12)	(0.13)
2nd Decile*Maquila Ratio	0.49***	0.22*	0.09	0.50***	0.14
	(0.11)	(0.12)	(0.11)	(0.12)	(0.11)
3rd Decile*Maquila Ratio	0.36***	0.18*	0.41***	0.34***	0.07
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
4th Decile*Maquila Ratio	0.19**	0.08	0.09	0.28***	0.06
	(0.09)	(0.09)	(0.09)	(0.09)	(0.09)
5th Decile*Maquila Ratio	0.14*	0.07	0.17**	0.15*	0.02
	(0.09)	(0.08)	(0.08)	(0.09)	(0.08)
6th Decile*Maquila Ratio	0.10	0.02	0.16**	0.18**	0.03
	(0.08)	(0.07)	(0.08)	(0.08)	(0.08)
6th Decile*Maquila Ratio	0.07	0.03	0.14**	0.06	-0.00
	(0.07)	(0.07)	(0.07)	(0.08)	(0.07)
8th Decile*Maquila Ratio	0.11*	0.08	0.06	-0.04	-0.02
	(0.07)	(0.06)	(0.07)	(0.08)	(0.07)
9th Decile*Maquila Ratio	0.07	0.04	0.03	0.06	-0.09
	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)
Maquila Ratio	-0.05	0.05	-0.01	-0.18***	-0.06
	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)
r2	0.12	0.13	0.13	0.14	0.12
N	18572	18533	18654	18705	18763

Notes:

Table 15: Regression (Probit analysis) of expansion of number of products on relative size of exporters: Maquila versus non-Maquila

	(1)	(2)	(3)	(4)	(5)
Dependent Variable	Increase in the number of products				
Initial Period	2004July-2005June	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June
Final Period	2005July-2006June	2006July-2007June	2007July-2008June	2008July-2009June	2009July-2010June
Type of Period	Normal	Normal	Normal	Crisis	Recovery
1st Decile (d)	-0.13***	-0.14***	-0.15***	-0.08***	-0.12***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
2nd Decile (d)	-0.14***	-0.13***	-0.15***	-0.09***	-0.11***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
3rd Decile (d)	-0.13***	-0.13***	-0.14***	-0.08***	-0.10***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
4th Decile (d)	-0.12***	-0.11***	-0.12***	-0.06***	-0.09***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
5th Decile (d)	-0.11***	-0.10***	-0.11***	-0.05***	-0.08***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
6th Decile (d)	-0.09***	-0.09***	-0.09***	-0.03***	-0.07***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
7th Decile (d)	-0.07***	-0.07***	-0.06***	-0.03***	-0.05***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
8th Decile (d)	-0.05***	-0.05***	-0.05***	-0.00	-0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
9th Decile (d)	-0.03***	-0.03**	-0.02	0.01	-0.03***
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
1st Decile*Maquila Ratio (d)	-0.01	0.02	-0.06***	-0.03	-0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
2nd Decile*Maquila Ratio	0.03	0.01	-0.04*	0.01	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
3rd Decile*Maquila Ratio	0.02	0.01	-0.04*	-0.00	-0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
4th Decile*Maquila Ratio	0.04**	-0.00	-0.04*	0.00	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
5th Decile*Maquila Ratio	0.00	0.00	0.00	-0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
6th Decile*Maquila Ratio	0.01	-0.00	-0.02	-0.01	0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
7th Decile*Maquila Ratio	0.00	0.01	-0.02	-0.01	-0.05***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
8th Decile*Maquila Ratio	-0.00	-0.02	-0.01	-0.03*	-0.04**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
9th Decile*Maquila Ratio	0.01	-0.01	-0.02	-0.02	0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Maquila Ratio	-0.00	0.01	0.08***	0.01	0.02
	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)
N	28581	28750	28017	28412	28658

Notes: