Online Appendix for "The Impact of Emerging Market Competition on Innovation and Business Strategy"

(NOT FOR PUBLICATION)

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Appendix A: Supplemental cross-sectional facts on innovation strategy choices from the Survey of Innovation and Business Strategy (SIBS)

Since the amount of disclosure of industry-level summary statistics for the WES is restricted by Statistics Canada and the WES ends in 2006, we also analyzed industry-level data from the related Survey of Innovation and Business Strategy (SIBS) for the year 2009. This survey is only a repeated cross-section and is therefore not useful for our main analysis of within-firm responses to the China shock. But its industry level data are still comparable and it includes other questions related to innovation that provide useful context and summary statistics. In particular, the SIBS industry level summary statistics displayed in table A1 show that a relatively large fraction of firms (almost half) successfully innovate over a three year period.

[Table A1]

Innovation strategies in the SIBS (defined less stringently than in table 1 of the paper, see table notes) are also quite common, and table A1 shows that the high share of manufacturing firms with innovation strategies and outcomes is broad-based and not driven by a few industries. Industries in which more firms adopt innovation strategies have a higher share of firms with successful innovation outcomes but the correlation is well below one. The share of firms with an innovation strategy is sometimes above and sometimes below the share of firms with a successful innovation outcome in an industry. This indicates that innovation strategy may be an important predictor of successful innovation outcomes but is neither a necessary nor a sufficient condition.

Appendix B: Autor-Dorn-Hansen type IV results

In this section, we investigate whether our results are driven by unobserved factors that are specific to the trade patterns between Canada and China. To address this potential concern, Autor, Dorn and Hanson (2013) propose to use the industry exports of China to other countries as instrument for exports increases in a given country (the US in their case, Canada in our case). We use Chinese exports to the same set of countries as ADH (Australia, Denmark, Finland, Germany, Japan, New Zealand, Spain, Switzerland) for this purpose, as they have seen similar increases in Chinese exports as Canada and are similar advanced economies.

[Table A2]

Results of using the Autor-Dorn-Hanson IV strategy are reported in table A2. These results are broadly consistent with our baseline IV results in tables 3 and 4.

Appendix C: Controlling for initial industry differences

In this section we investigate whether the innovation responses to intensifying Chinese competition are driven by initial industry differences in innovation or firm size. Recall that our IV strategy relies on initial Chinese competition in 1999. If high import shares from China in 1999 signal that these industries are less innovative or have smaller/less productive firms to begin with, then the decrease in process innovation in the following years might be driven by this initial industry weakness. To address this issue, we construct industry-level measures of the share of firms that report product or process innovations in 1999 as proxy for initial industry level innovativeness. Additionally, we use domestic revenue at the firm-level as a measure of firm productivity, consistent with heterogeneous firm trade models such as Melitz (2003).

[Table A3]

Table A3 documents the results of controlling for initial industry innovativeness and initial firm domestic revenue. All our baseline results remain highly significant and our results on the increase in the number of product innovations are strengthened.

Appendix D: Initial innovation strategies and non-US competition perceptions

As described in section 3.3, identifying innovator performance moments in response to a competition shock requires that initial strategy choices be predetermined. Our main concern is that the firms that benefitted the most from an innovation strategy at the time of China's WTO entry in 2001, were also able to forecast this WTO entry already in 1999. The consequence would be strategy self-selection, which would lead to a downward bias in the exit coefficient and an upward bias in the profit coefficient.

To investigate the plausibility of this strategy self-selection, we again utilize the competition perception data we also use in section 4.1 to validate that Chinese competition was the main shock under consideration. As shown in section 4.1 this data on perceptions of competition by location of competitors did mirror the increase in Chinese competition from international trade data while not reflecting intensifying competition from other sources, such as Mexico or other top export growth countries to Canada. Another key advantage of this data is that it is available at the firm level.

[Table A4]

If it is indeed the case that firms that more strongly believe in increasing Chinese competition did more systematically self-select into innovation strategies, then we should see a strong correlation of perceived non-US international competition and strategy choices. Table A4 shows that there is no significant relationship between perceptions of stronger non-US international competition in 1999, and innovation strategies. Importantly, due to the panel nature of the WES data, we can go beyond checking whether there is a correlation of initial strategies in 1999 with contemporary competitive perceptions in 1999. We can also analyze whether initial strategy choices in 1999 are correlated with the level of future competitive perceptions in 2005. It is useful to remember that these competitive perceptions correctly reflect the rise in Chinese competitive perceptions between 1999 and 2005 as well as the level of future competitive perceptions in 2005. However, as columns (2) and (3) of table A4 show, none of the competitive perception variables is significantly correlated with initial innovation strategies.

Appendix E: Aggregate trends in processing trade

In section 5.1 we controlled for outsourcing as an alternative explanation for declining process innovation in response to Chinese competition. If outsourcing is indeed a major factor for manufacturing, then one would expect this to be related to trade of intermediates, or processing trade. It is worthwhile to inspect the general time trends in overall Chinese trade to Canada, as well as processing trade, in Figure A1.

[Figure A1]

As the figure shows, overall Chinese exports to Canada accelerated sharply after China's WTO entry at the end of 2001. The dashed line captures China's processing trade, which also accelerated, but at a slower pace. In fact, the share of processing trade in China's exports to Canada has been systematically falling since China's entry into the WTO. These aggregate trends already foreshadow some of our empirical analysis in section 5.1.

Appendix F: Controlling for long-run trends

This section addresses the potential issue that industries with intensifying Chinese competition might also have significantly different long run trends as other industries. Since data on innovation and strategy outcomes for Canada do not exist before 1999, we instead use more aggregate data on these outcomes after the end of our sample. Industry-level analysis allows us to add more data from the SIBS dataset on strategic behavior and also enables an analysis of aggregate strategic changes due to entrants with different strategies, even if incumbents are not changing their strategies. Together with selective exit of firms with innovation strategies, this could lead to a change in strategic orientation within an industry without much of a change within continuing firms.

Since the SIBS does not ask firms for all the detailed strategic dimensions of the WES, we had to adjust the WES strategy measures to focus on whether product or process innovation were considered important. With this industry-level variation in the strategy measure over the 2001–2012 period, we estimated changes in the share of firms that considered process or product innovation important for their strategy was affected by Chinese competition.¹ Similarly, we construct measures of the share of firms with a product or process innovation in the last 3 years and aggregate to the industry level to investigate whether Chinese competition continued to have a significant impact on innovation outcomes past 2005.

[Table A5]

Table A5 documents the results. First, process and product innovation strategies both appear to have declined, with process innovation strategy falling almost twice as much with a decline that is

¹ For this long-run specification, we used three non-overlapping time differences from 2001–2005, 2005–2009, and 2009–2012 and estimated effects with industry and year fixed effects.

statistically significant at the 10% level. These results are consistent with strategic orientation changing through selection, including entrants adjusting their strategy optimally, while incumbent firms might have trouble changing strategies. At the same time, columns 3 and 4 confirm that process innovations are significantly declining on the industry level, even controlling for long-run industry level trends.

Appendix G: Innovation and strategy responses, excluding foreign-owned firms

In this section we investigate whether some of our innovation results are driven by foreign owned firms. In particular, it might be the case that subsidiaries of multinational firms innovate less process innovations in response to Chinese competition because they can access process innovations of their parent companies².

[Table A6]

Around 16% of Canadian manufacturing establishments in our sample are foreign-owned, mostly with corporate parents in the US. Since we have access to ownership share information, we exclude establishments with majority foreign ownership from our analysis. Table A6 shows results of the impact of Chinese competition on innovation and business strategy excluding foreign-owned establishments. Results are qualitatively similar to our baseline results in table 4. Even as the reduction in the number of process innovation is slightly weaker than before, the negative innovation incentive effects stays highly statistically significant. Furthermore, the increase in number of exclusive production innovations and the coefficient on product innovation strategy is

² We thank an anonymous referee for raising this issue.

almost unchanged. The results excluding foreign firms therefore remain consistent with our baseline theory.



Figure A1: Time series of total Chinese exports to Canada, processing exports and the share of processing trade from 2000 to 2006.

Table A1: Industry-level Summary Statistics (SIBS 3/4-digit NAICS aggregation)

UNIC Charge 1999/200 PRODE PRODE PRODE PRODE PRODE PRODE 100 Control operation operating subconveg refiguration 0.24 0.25 0.21 0.21 121 Cat od ose tabling manufacturing 0.24 0.24 0.25 0.21 0.21 122 Cat od ose tabling manufacturing 0.24 0.24 0.44 0.26 0.25 0.21 0.25 0.21 0.25 0.			Chinese import share		Innovation (outcomes (share of firms)	Innovation strategies (share of firms)		
111 Comparing any production department on the second se	NAICS	Category Name	Change 1999-2005	1999	Product	Process	Product	Process	
3131evention between periods and source of periods o	3341	Computer and peripheral equipment manufacturing	0.275	0.036	0.653	0.386	0.5	0.534	
121Calal sector0.230.230.230.230.240.240.250.250.250.250.25211Control sector0.210.240.240.240.240.250.2	3333	Ventilation, heating, air-conditioning, and commercial refrigeration	0.266	0.073	0.691	0.521	0.547	0.513	
31Under and ender growth ender structure02802804.404.404.704.70000See and ender structure0.4 </td <td>3152</td> <td>Cut and sew clothing manufacturing</td> <td>0.248</td> <td>0.216</td> <td>0.306</td> <td>0.125</td> <td>0.212</td> <td>0.208</td>	3152	Cut and sew clothing manufacturing	0.248	0.216	0.306	0.125	0.212	0.208	
314Compare indextoring consist manufacturing212012013023023021025100Consistance accent manufacturing014015014014 <t< td=""><td>337</td><td>Furniture and related product manufacturing</td><td>0.208</td><td>0.088</td><td>0.378</td><td>0.44</td><td>0.429</td><td>0.407</td></t<>	337	Furniture and related product manufacturing	0.208	0.088	0.378	0.44	0.429	0.407	
1210Chick gener substrained1210210310410370430461231Constrained0,130,230,430,370,370,370,371241Marchelexe mainfacturing0,130,230,430,370,370,370,371241Marchelexe mainfacturing0,140,240,450,450,450,470,471241Marchelexe mainfacturing0,140,240,480,480,470,470,471241Marchelexe mainfacturing0,140,150,180,480,14	334R	Computer and electronic product manufacturing	0.182	0.088	0.488	0.503	0.321	0.901	
11112	2150		0.102	0.000	0.400	0.481	0.321	0.386	
14114	3136	Commission could be a set of the	0.161	0.280	0.555	0.481	0.375	0.280	
141 Modeling optime manufacturing 115 116 <	3342		0.167	0.041	0.676	0.542	0.696	0.595	
1415%15%0.100.41 </td <td>339R</td> <td>Miscellaneous manufacturing</td> <td>0.154</td> <td>0.201</td> <td>0.445</td> <td>0.537</td> <td>0.373</td> <td>0.518</td>	339R	Miscellaneous manufacturing	0.154	0.201	0.445	0.537	0.373	0.518	
312Nonschol gepiner municaturing0.140.140.240.250.540.250.54121Norse optical regarding and substrained0.150.160.160.160.170.160.160.160.160.170.16	314	Textile product mills	0.151	0.087	0.404	0.444	0.343	0.332	
311Electric lighting explore manufacturing0.140.710.74 <td>3352</td> <td>Household appliance manufacturing</td> <td>0.144</td> <td>0.098</td> <td>0.726</td> <td>0.636</td> <td>0.725</td> <td>0.543</td>	3352	Household appliance manufacturing	0.144	0.098	0.726	0.636	0.725	0.543	
11Lather and labe product manufacturing1110.120.120.120.120.130.130.14 <t< td=""><td>3351</td><td>Electric lighting equipment manufacturing</td><td>0.142</td><td>0.231</td><td>0.748</td><td>0.583</td><td>0.656</td><td>0.245</td></t<>	3351	Electric lighting equipment manufacturing	0.142	0.231	0.748	0.583	0.656	0.245	
319Other words product manufacturing0.130.800.810.51	316	Leather and allied product manufacturing	0.129	0.301	0.617	0.452	0.447	0.339	
111Seried product product parameter interparties of parameter interpart	3219	Other wood product manufacturing	0.113	0.060	0.382	0.53	0.201	0.359	
333Achterial and structuring manufacturing0580570.780.840.210.2120.212144Semicolator and prediction and acturing0680740.84	3117	Seafood product preparation and packaging	0.104	0.023	0.098	0.358	0.195	0.346	
27.1Nomedia consider subscription comport manufacturing0.810.810.870.870.840.850.840.8728.1Seminor comport manufacturing0.81 <td< td=""><td>3323</td><td>Architectural and structural metals manufacturing</td><td>0.095</td><td>0.014</td><td>0.306</td><td>0.445</td><td>0.21</td><td>0.432</td></td<>	3323	Architectural and structural metals manufacturing	0.095	0.014	0.306	0.445	0.21	0.432	
144Second and electronic comform annufacturing0.880.880.890.890.890.490.47201Second and electronic form annufacturing0.070.070.310.320.320.32313March and spoce servation0.070.080.310.310.320.320.32313March and spoce servation0.070.080.320.320.320.320.32313March and spoce servation form annufacturing0.070.080.070.420.320.320.32314March and spoce servation reamofacturing0.0810.0810.320	327	Non-metallic mineral product manufacturing	0.083	0.057	0.376	0.468	0.26	0.419	
1212Newspace and sequences word product manufacturing0.0810.0810.0810.4910.4910.331331Minor sequences manufacturing0.0760.0810.0810.520.520.540.571332Ditre deciral acquingents and composent manufacturing0.0810.0810.0810.57<	3344	Semiconductor and other electronic component manufacturing	0.083	0.018	0.589	0.589	0.496	0.47	
211Semificad word protection marketuring0.070.080.160.50.220.32223Mericad metal production marketuring0.0740.0280.0270.520.540.47334Mericad metal production marketuring0.0740.0840.080.0270.570.570.57335Merical submetant ad component marketuring0.0840.080.0520.0970.0210.57336Metaloxiding marketuring0.0840.080.0520.0570.630.63337Paties production submetant subjection marketuring0.0840.080.0520.630.630.63338Paties production subfection marketuring0.0840.040.0520.650.630.630.630.630.630.630.630.630.650.650	3212	Veneer nlywood and engineered wood product manufacturing	0.083	0.005	0.256	0.496	0 341	0 353	
1210birt factured manufacturing0.070.070.270.220.240.471381manufacturing0.060.080.370.670.460.471384Mathewing mainty manufacturing0.060.080.370.460.471381Mathewing mainty manufacturing0.060.080.310.410.420.571381Medic laujoment and supplies manufacturing0.060.080.310.420.570.420.511381Mathemin manufacturing0.060.080.370.430.430.430.431381Mathemin factoring manufacturing0.040.040.520.570.430.431381Mathemin factoring manufacturing0.040.040.520.570.430.421392Patter and ruber product manufacturing0.040.040.420.510.420.520.521393Mathemin factoring manufacturing0.040.040.040.520.520.520.520.521394Mathemin factoring manufacturing0.040.040.040.520.520.520.520.521394Mathemin factoring manufacturing0.040.040.040.52<	2211	Caurally and used procession	0.070	0.007	0.230	0.5	0.392	0.333	
3110 thm indication inditation indication indication indication	3211	Sawining and wood preservation	0.075	0.007	0.310	0.5	0.282	0.522	
13.1000.040.180.190.0420.140.140.1413.1000.0510.0510.0510.0510.0510.05113.100.0510.0510.0510.0510.0510.0510.05113.100.0510.0510.0510.0510.0510.0510.0510.05113.100.0510.0510.0510.0510.0510.0510.0510.05113.1Textle mils0.0660.0240.5310.0630.0480.05213.2Textle mils0.0660.0240.0510.0510.05113.2Textle mils0.0650.0140.0510.0510.05113.2Textle mils0.0450.0140.0510.0510.05113.2Textle mils0.0510.0510.0510.0510.05113.3Adma and alumina production and consing0.0510.0510.0510.05113.3Adma and alumina production and consing0.0510.0510.0510.0510.05113.3Adma and alumina production and consing0.0510.0510.0	3328	Other fabricated metal product manufacturing	0.076	0.036	0.417	0.522	0.540	0.557	
339Other detricial quignent and component manufacturing0.060.0260.2720.5740.680.547331Methoding machinery manufacturing0.0610.0310.5100.640.2730.233331Methoding machinery manufacturing0.0610.0340.5100.640.6330.6413335Methoding machinery manufacturing0.0670.0320.4380.6500.6413346Other transportation equipment manufacturing0.0470.0320.5330.6300.4380.3563357Other transportation equipment manufacturing0.0460.0240.3210.5220.5220.5220.5230.6563335Methoding and reletad support activities0.0450.0140.4220.530.540.530.540.540.550.530.550.520.520.520.520.520.520.520.520.520.550.530.550.	331R	Primary metal manufacturing	0.074	0.038	0.387	0.602	0.234	0.447	
3334Metalworking machaturing0.6640.0080.0270.6640.470.52334Boller, tak and shipping contamer manufacturing0.0510.0210.0220.510.0210.62334Boller, tak and shipping contamer manufacturing0.0510.0210.420.530.640.640.64335revite mails0.0660.0240.530.6010.480.6550.640.65334revite mails0.0660.0260.320.6320.6450.656332revite mails0.0660.0160.420.5220.4360.656333Alumina and aluming production and processing0.0620.0310.6450.5220.626334Maine and aluming production and processing0.0610.0120.6220.2320.321335Margitanda, masuring medical and control instruments0.0610.0120.5220.2640.636334Margitanda, masuring medical and control instruments0.0610.0120.5210.3210.3210.321334Margitanda, masuring medical and control instruments0.0610.0120.5450.5460.5460.546335Margitanda, masuring medical and control instruments0.0610.0220.5410.5420.5410.541335Margitanda, masuring medical and control instruments0.0660.0280.5420.5420.5420.541336Margitanda, masuring medical and synaatical and	3359	Other electrical equipment and component manufacturing	0.065	0.026	0.527	0.574	0.465	0.547	
331Medical sequiment and supplies manufacturing0.0530.0540.0740.720.73238Metric and alphaging contrainer manufacturing0.0490.0480.390.3970.4280.431239Phatics and obser produsts manufacturing0.0490.0480.330.4380.4310.423230Textite mils0.0460.0480.330.4380.3450.4380.435231Textite mils0.0460.0480.330.4380.4360.434233Munifacturing contraints training0.0460.0140.420.320.4380.436233Munifacturing contraints training0.0460.0100.6220.520.520.52233Munifacturing contraints training0.0470.0120.120.520.520.52233Metric alporter training contraints training0.0370.0120.120.540.4380.45233Munifacturing product manufacturing0.0370.0280.510.530.540.530.53234Matching manufacturing0.0360.0280.510.530.540.530.54235Matching manufacturing0.0370.0280.510.530.540.540.53236Matching manufacturing0.0360.0380.540.530.540.540.53237Matching manufacturing0.0360.0380.540.540.540.540.54<	3334	Metalworking machinery manufacturing	0.064	0.008	0.525	0.696	0.273	0.525	
324Baller, tank and sploping container manufacturing0.010.0420.510.4220.5720.4920.432818Other transportation equipment manufacturing0.0470.0470.0570.4380.5610.4380.561339Other transportation equipment manufacturing0.0460.0480.0510.6310.4480.346321Totacion mundaturing0.04610.0460.0240.3210.3420.342323Totacion mundaturing0.04510.0410.340.3310.4520.511324Totacion mundaturing0.04510.0410.420.3310.4520.511325Machine product manufacturing0.04610.0410.420.5210.5210.521325Machine product manufacturing0.0560.0580.5410.4520.5410.452325Machine ymanufacturing0.0560.0580.5410.4520.5410.452325Machinery manufacturing0.0560.0580.5450.5430.5420.541325Machinery manufacturing0.0260.0580.5450.5420.5420.542326Machinery manufacturing0.0310.0260.510.5120.5240.545327Machinery manufacturing0.0310.0260.5450.5450.5390.541338Machinery manufacturing0.0310.0260.5450.5410.540.541338Machi	3391	Medical equipment and supplies manufacturing	0.063	0.034	0.701	0.64	0.49	0.512	
3288Match and uber products manufacturing0.4980.4990.5990.5990.5490.543330Textle milks0.6460.6450.530.5300.4830.391331Textle milks0.6460.6450.5210.5210.4830.481332Textle milks0.6450.6450.5210.5210.5210.521333Aumina and aluminum production and processing0.6450.6400.5220.5220.5220.521334Aumina and aluminum production and processing0.6400.6300.6410.5220.5210.521335Marginena, measuring, medical and control instruments0.6300.6310.5410.5420.5320.532335Marginena, measuring, medical manufacturing0.6360.6360.6360.5430.6420.530.542336Electrical equiperine transfecturing0.6360.6360.5430.5420.5420.542337Mardinery manufacturing0.6360.6360.6430.5420.5420.5420.542338Mardinery manufacturing0.6360.6360.5430.5420.5420.5420.542339Mardinery manufacturing0.6360.6360.5430.5420.5420.5420.542339Mardinery manufacturing0.6360.6360.5430.5420.5420.5420.542341Andergetaber granting antimative simplication and acturing0.604 <td< td=""><td>3324</td><td>Boiler, tank and shipping container manufacturing</td><td>0.051</td><td>0.011</td><td>0.422</td><td>0.517</td><td>0.422</td><td>0.573</td></td<>	3324	Boiler, tank and shipping container manufacturing	0.051	0.011	0.422	0.517	0.422	0.573	
3899Other transportation equipment manufacturing0.0470.0720.4880.570.4880.623311Intel milemanufacturing0.0460.0240.2910.5210.430.462321Tokoto manufacturing0.0450.0410.4220.5210.450.651323Aubier product manufacturing0.0450.0140.4220.5210.4550.252334Chern manufacturing0.0420.0100.4610.5220.2520.252334Chern metal production and processing0.0420.0100.4610.5220.3270.252334Chern metal production and processing0.0340.0100.4610.520.5270.2523357Machine boop, tunned product, and botic0.0350.0270.520.5370.2520.2523358Machinery manufacturing0.0360.0260.530.5410.5400.5410.5523358Machinery manufacturing0.0250.5450.5470.5420.5210.5473359Machinery manufacturing0.0260.0500.5450.5470.5450.5473360Matery manufacturing0.0310.0270.5450.5470.5460.5453361Matery manufacturing0.0310.0310.5120.5460.5460.5463362Matery manufacturing0.0310.0310.5450.5460.5460.5463363Matery manufacturing	326R	Plastics and rubber products manufacturing	0.049	0.043	0.599	0.597	0.459	0.451	
313 Fundie milia 0.46 0.45 0.53 0.603 0.483 0.395 313 Printing and related support activities 0.045 0.024 0.21 0.521	3369	Other transportation equipment manufacturing	0.047	0.072	0.438	0.5	0.438	0.625	
33.Printing and relativing0.440.420.210.52.10.440.4222Takkor manufacturing0.440.440.420.520.450.5533.4Aliman ad Jouninum protessing0.440.410.420.520.290.2233.4Other metal joroluction and processing0.440.410.420.520.290.2233.4Manda diaminum protessing0.440.410.440.510.420.240.2333.5Machine shops, furned product, and stresm, int and bolt0.030.420.420.520.270.2833.6Machine shops, furned product, and stresm, int and bolt0.0360.420.440.5140.430.4233.6Machine shops, furned product manufacturing0.0360.270.330.470.330.4733.1Machine shops, furned product manufacturing0.0270.310.5120.520.530.510.530.530.530.530.530.530.530.530.530.530.530.530.530.530.530.530.530.540.530.530.530.530.540.530.530.540.55 <td>313</td> <td>Textile mills</td> <td>0.046</td> <td>0.045</td> <td>0.553</td> <td>0.603</td> <td>0.483</td> <td>0.396</td>	313	Textile mills	0.046	0.045	0.553	0.603	0.483	0.396	
112 Totace readulation in a functional 0.05 0.01 NA NA NA NA 122 Totace readulation in a functional 0.05 0.014 0.02 0.53 0.55 1313 Alumina and aluminum production and processing 0.040 0.010 0.61 0.52 0.25 0.25 1314 Other media processing and processing 0.040 0.037 0.52 0.52 0.25 1315 Other media processing and processing 0.040 0.010 0.62 0.52 0.22 0.23 1316 Exercical equipment mondreturing 0.037 0.012 0.51 0.14 0.406 1317 Machinery monufacturing 0.056 0.18 0.47 0.53 0.24 0.405 1318 Machinery monufacturing 0.056 0.18 0.47 0.53 0.25 0.45 1318 Machinery monufacturing 0.056 0.18 0.47 0.53 0.25 0.45 1314 matic hegelable processing 0.056 0.18 0.47 0.53 0.55 1318 Machinery monufacturing 0.056 0.12 0.55 0.46 0.54 1314 matio cheminal foroid manufacturing 0.0	323	Printing and related support activities	0.046	0.024	0.201	0.521	0.34	0.462	
Image: Constraint of the second sec	3122	Tobacco manufacturing	0.045	0.001	NA NA	NA	NA NA	NA	
4426 Nitobe product manufacturing U.B.S U.H.S U.H.S <t< td=""><td>3122</td><td>Deble and actioning</td><td>0.045</td><td>0.001</td><td>0.422</td><td>0.522</td><td>0.405</td><td>NA 0.555</td></t<>	3122	Deble and actioning	0.045	0.001	0.422	0.522	0.405	NA 0.555	
313Alumina and autimum production all processing0.0420.0030.0840.590.2240.2240.224314Maring and control instruments0.0390.0200.6210.5720.5720.523325Maring and aution and processing0.0370.0120.6220.5770.5720.523325Marine shops, turned product, and steven, unt and bot0.0370.0120.0260.0280.4410.4390.5083252Converted paper product, and steven, unt and bot0.0360.0180.4470.5140.4390.5083253Marine ymanufacturing0.0260.0280.3550.5470.3330.4253384Marine ymanufacturing0.0260.0280.4850.5290.3970.4913355Marine ymanufacturing0.0130.0070.330.5990.3970.4913356Railroad rolling stock manufacturing0.0130.0020.4520.5440.3150.5313357Baic chemical product manufacturing0.0080.0130.4290.4340.310.4913358Railroad rolling stock manufacturing0.0070.0110.4110.330.660.643359Baic chemical manufacturing0.0040.0110.4110.330.640.563350Baic chemical manufacturing0.0050.0130.590.530.540.3563351Baic chemical manufacturing0.0040.0110.590	3262	Rubber product manufacturing	0.045	0.014	0.422	0.532	0.495	0.050	
31XOther metal production and processing0.0400.0400.0100.4520.5220.2590.328334Navigutonal, measuring, metala and control instruments0.0370.0120.6220.5270.5340.4440.4063332Extictional quanter manufacturing0.0360.0180.4740.5140.4390.5083222Converted paper product, manufacturing0.0260.0280.3150.5470.3330.4253343Machinery manufacturing0.0270.0660.5880.4850.5290.4793144Fruit and vegetable preserving and specially food manufacturing0.0180.0270.3330.5120.4350.5140.4913554Other chemical product, manufacturing0.0130.0040.4210.5450.4400.4350.5333555Salt chemical manufacturing0.0130.0040.0410.330.5120.4350.5330.5120.4350.5330.5120.4350.5330.5120.4350.5330.5120.5350.540.540.5340.5350.540.540.5340.5350.540.5340.5350.540.5340.5350.540.5340.5350.540.5340.5550.540.540.5340.5350.5140.5450.5350.540.540.5350.540.540.5350.5550.540.540.540.5550.540.5560.5560.5560.5650.	3313	Alumina and aluminum production and processing	0.042	0.003	0.366	0.59	0.229	0.321	
3345 Navigational, mescuring, medical and control instruments 0.039 0.020 0.622 0.527 0.572 0.523 2 Machine shops, turned product, and screw, nut and bott 0.036 0.018 0.474 0.514 0.433 0.605 3335 Electrical equipment manufacturing 0.036 0.027 0.066 0.588 0.485 0.529 0.445 3338 Machinery manufacturing 0.027 0.026 0.581 0.512 0.624 0.533 3345 Motor vehicle parts manufacturing 0.018 0.007 0.331 0.529 0.344 0.315 3355 Other vehicle product manufacturing 0.013 0.020 0.412 0.431 0.32 0.331 0.321 0.331 0.321 0.331 0.324 0.331 0.321 0.331 0.321 0.331 0.321 0.331 0.321 0.331 0.32 0.331 0.321 0.414 0.33 0.326 0.331 3111 Anima food manufacturing 0.007 0.001	331X	Other metal production and processing	0.040	0.010	0.461	0.522	0.269	0.328	
3327Machine shops, turned product, and screw, nut and bolt0.0370.0320.1920.1920.6050.2140.4063338Machine shops, turned product manufacturing0.0360.0280.3150.5470.3330.4253222Converted paper product manufacturing0.0260.0280.3150.5470.3330.4253141Fruit and vegetable preserving and specially food manufacturing0.0260.0220.5130.5120.4250.5443258Other chemical product manufacturing0.0130.0040.4720.5210.4020.4353258Rolind roling stock manufacturing0.0310.0040.4720.4210.4020.4353251Basic chemical manufacturing0.0310.0400.4410.330.4640.3353252Reain, synthetic rubber, and artificial and synthetic fibres and filaments0.0050.0130.410.330.4623251Basic chemical manufacturing0.0040.0080.330.4840.420.3343254Priotem and cal product manufacturing0.0040.0010.2690.2540.5443252Reain, synthetic rubber, and artificial and synthetic fibres and filaments0.0020.0110.4140.5140.4240.3343118Bakeries and cortilia marufacturing0.0020.0010.2790.4070.3240.4623118Bakeries and cortilia marufacturing0.0020.0010.2790.4210.540	3345	Navigational, measuring, medical and control instruments	0.039	0.020	0.622	0.527	0.572	0.523	
3333Electrical equipment manufacturing0.0360.0180.0180.5140.4940.5083334Machinery manufacturing0.0270.0660.5680.4850.5290.4793338Machinery manufacturing0.0270.0660.5680.4850.5290.5843363Motor vehicle parts manufacturing0.0180.0070.3330.5990.3970.4913354Other vehicle parts manufacturing0.0130.0020.5450.4550.4620.4323355Railroad rolling stock manufacturing0.0090.0880.4230.4340.3150.5313351Basic denical manufacturing0.0090.0880.4230.4440.3150.5313352Reins and paperboard mills0.0070.0110.4140.3330.640.643318Bakeris and toritik and synthetic fibres and filaments0.0050.0130.4320.4140.3160.543318Bakeris and toritik and synthetic fibres and filaments0.0050.0130.5130.3440.540.54334Petroleum and coal product manufacturing0.0040.0010.5290.4710.540.34334Petroleum and coal product manufacturing0.0020.0010.510.2690.270.462335Pair coaling and aflesive manufacturing0.0020.0010.510.510.3610.563335Pair coaling and aflesive manufacturing0.0020.001 <td< td=""><td>3327</td><td>Machine shops, turned product, and screw, nut and bolt</td><td>0.037</td><td>0.012</td><td>0.192</td><td>0.605</td><td>0.214</td><td>0.406</td></td<>	3327	Machine shops, turned product, and screw, nut and bolt	0.037	0.012	0.192	0.605	0.214	0.406	
3222Converted paper product manufacturing0.0360.0270.0360.5470.3330.425314Fruit and vegetable preserving and specialty food manufacturing0.0260.0220.5130.5120.2450.5443154Motor vehicle parts manufacturing0.0180.0070.3930.5990.3970.4913365Raileod rolling stock manufacturing0.0130.0040.4720.5110.0360.3640.2733365Raileod rolling stock manufacturing0.0130.0020.5450.4550.3640.5333251Bais chemical manufacturing0.0090.0080.4290.4440.3150.5333252Rein, synthetic rubber, and artificial and synthetic fibres and filaments0.0070.0110.4140.330.260.3663118Bakeries and toriling manufacturing0.0040.0080.330.3480.640.3343254Petroleum and coal product manufacturing0.0040.0010.470.6690.340.343254Patroleum and coal product manufacturing0.0040.0010.570.4210.340.343254Patroleum and facturing0.0020.0010.470.590.540.543255Pairi, coating and acheise manufacturing0.0020.0010.570.4210.340.363254Patroleum and facturing0.0020.0010.570.510.340.360.343255Pairi, coatin	3353	Electrical equipment manufacturing	0.036	0.018	0.474	0.514	0.439	0.508	
3338Machinery manufacturing0.0270.0080.5880.4850.5290.4793341Fruit and vegetable preserving and special food manufacturing0.0180.0220.5310.5990.3970.4913358Allotor vehicle parts manufacturing0.0130.0020.530.5920.3640.4323351Bailcord rolling stock manufacturing0.0130.0020.520.4440.260.333111Aninal food manufacturing0.0080.0130.420.4440.260.333252Rein, synthetic rubber, and artificial and synthetic fibres and filaments0.0070.0110.410.330.260.343252Rein, synthetic rubber, and artificial and synthetic fibres and filaments0.0070.0110.410.330.2540.343118Backeries and tortilia manufacturing0.0040.0010.530.3480.340.343118Backeries and tortilia manufacturing0.0040.0010.590.420.340.343118Backeries and tortilia manufacturing0.0020.0110.420.340.340.343118Backeries and tortilia manufacturing0.0020.0110.420.340.360.343118Backeries and tortilia manufacturing0.0020.0110.420.340.340.343129Patrico attransfere manufacturing0.0020.0110.420.340.340.343131Mater poduct manufac	3222	Converted paper product manufacturing	0.036	0.028	0.315	0.547	0.333	0.425	
3114Fruit and vegetable preserving and specially food manufacturing0.0260.0220.5130.5120.2450.5843253Other chemical product manufacturing0.0130.0010.0330.5990.5910.4020.4353365Raiload rolling stock manufacturing0.0130.0020.5450.4520.4020.4353365Raiload rolling stock manufacturing0.0130.0090.0080.4290.4340.2960.4023251Basic chemical manufacturing0.0070.0010.4410.330.3660.643252Rein, synthetic rubber, and artificial and synthetic fibres and filaments0.0050.0130.4320.4440.2960.3643252Rein, synthetic rubber, and artificial and synthetic fibres and filaments0.0050.0130.5190.6350.5643254Petroleum and coal product manufacturing0.0040.0010.5190.2690.270.4623255Pairt, coatting and athesive manufacturing0.0020.0010.5190.2690.270.4623254Patroduct manufacturing0.0020.0010.5990.4210.340.340.343254Patroduct manufacturing0.0020.0010.5990.4210.5940.484326Motor vehicle patro and patro manufacturing0.0020.0010.590.510.5030.503326Patroduct manufacturing0.0020.0010.590.510.5030.503<	333R	Machinery manufacturing	0.027	0.006	0.568	0.485	0.529	0.479	
3363 Motor vehicle parts manufacturing 0.018 0.007 0.393 0.599 0.397 0.491 225X Othor vehicle parts manufacturing 0.013 0.004 0.422 0.521 0.402 0.435 325X Othor vehicle parts manufacturing 0.013 0.002 0.545 0.634 0.273 3111 Animal food manufacturing 0.009 0.008 0.422 0.414 0.315 0.533 3252 Reis, opther choler, and artificial and synthetic fibres and filaments 0.007 0.011 0.441 0.33 0.266 0.526 0.54 3118 Food manufacturing 0.005 0.011 0.47 0.669 0.526 0.54 3118 Bakeries and tortilia manufacturing 0.005 0.013 0.519 0.635 0.254 0.584 3118 Bakeries and tortilia manufacturing 0.004 0.001 0.501 0.269 0.27 0.662 3118 Bakeries and tortilia manufacturing 0.002 0.001 0.579 0.421 0.534 0.432 3116 Metor vehicle bordy and traler manufacturing	3114	Fruit and vegetable preserving and specialty food manufacturing	0.026	0.022	0.513	0.512	0.245	0.584	
325xOther chemical product manufacturing0.0130.0040.4720.5210.4020.4353365Railroad rolling stock manufacturing0.0030.0020.5450.4550.3640.2733365Baic chemical manufacturing0.0080.0130.4220.4440.2960.3253251Pulp, paper and paper board mills0.0070.0010.4140.3360.643252Resin, synthetic rubber, and artificial and synthetic fibres and filaments0.0050.0130.5190.6550.5643118Bakeries and torling manufacturing0.0040.0010.5110.2690.3260.544324Petroleum and cal product manufacturing0.0040.0010.5010.2690.270.4623254Paint coating and adhesive manufacturing0.0020.0010.5790.4210.5940.4883254Paint coating and adhesive manufacturing0.0020.0010.5790.4210.5940.4883254Pharmaceutical and medicine manufacturing0.0020.0010.590.5030.5110.5033254Pharmaceutical and medicine manufacturing0.0020.0010.4840.5110.4140.3363254Pharmaceutical and medicine manufacturing0.0010.0070.590.5030.5110.5033254Pharmaceutical and medicine manufacturing0.0020.0010.590.5030.5110.3443254Pharmaceutical and medicine manuf	3363	Motor vehicle parts manufacturing	0.018	0.007	0.393	0.599	0.397	0.491	
336 Rairoad rolling stock manufacturing 0.01 0.01 0.042 0.545 0.042 0.042 3111 Animal food manufacturing 0.009 0.008 0.429 0.434 0.315 0.533 3121 Basic chemical manufacturing 0.007 0.001 0.441 0.33 0.26 0.356 3222 Resin, synthetic rubber, and artificial and synthetic fibres and filaments 0.007 0.001 0.441 0.33 0.26 0.356 3222 Resin, synthetic rubber, and artificial and synthetic fibres and filaments 0.005 0.01 0.441 0.33 0.26 0.584 3118 Bokeries and tortilla manufacturing 0.005 0.01 0.47 0.669 0.356 0.54 3118 Bokeries and tortilla manufacturing 0.004 0.001 0.510 0.269 0.27 0.462 3125 Paint, coating and adhesive manufacturing 0.002 0.001 0.479 0.407 0.187 0.364 3254 Aerospace product manufacturing 0.002 0.001 0.479 0.411 0.413 0.608 3254 Mo	325X	Other chemical product manufacturing	0.013	0.004	0.472	0.521	0 402	0.435	
2.55 Additional additadditionadditional additional additionadditional additional addit	3365	Pailcoad rolling stock manufacturing	0.013	0.003	0.545	0.455	0.364	0.273	
3111 Animal adduting 0.009 0.009 0.432 0.434 0.514 0.533 3251 Basic chemical manufacturing 0.008 0.011 0.441 0.33 0.26 0.356 3252 Resin, synthetic rubber, and artificial and synthetic fibres and filaments 0.005 0.001 0.441 0.33 0.26 0.584 3252 Resin, synthetic rubber, and artificial and synthetic fibres and filaments 0.005 0.011 0.47 0.669 0.536 0.64 3118 Food manufacturing 0.004 0.008 0.533 0.348 0.42 0.34 3118 Bakeries and tortilla manufacturing 0.004 0.001 0.510 0.269 0.27 0.462 3116 Meat product manufacturing 0.002 0.001 0.59 0.401 0.54 0.452 3254 Perspace product and parts manufacturing 0.002 0.001 0.471 0.494 0.364 3254 Pharmaceutical and medicine manufacturing 0.001 0.001 0.475 0.444 0.364 3254 Pharmaceutical and medicine manufacturing 0.000	2111		0.015	0.002	0.345	0.435	0.304	0.273	
3251 basic chemical maturiaturing 0.008 0.013 0.432 0.414 0.296 0.412 2211 Puly, paper and parbbaar mills 0.007 0.001 0.411 0.33 0.266 0.356 3252 Resin, synthetic rubber, and artificial and synthetic fibres and filaments 0.005 0.011 0.47 0.669 0.536 0.64 3118 Bakeries and tortificial manufacturing 0.004 0.008 0.333 0.348 0.42 0.334 324 Petroleum and coal product manufacturing 0.004 0.001 0.501 0.269 0.27 0.462 3116 Meat product manufacturing 0.002 0.001 0.597 0.407 0.187 0.307 3254 Paint, coating and athesive manufacturing 0.002 0.001 0.444 0.611 0.413 0.608 3361 Motor vehicle body and trailer manufacturing 0.002 0.001 0.444 0.722 0.333 0.611 3121 Beverage manufacturing 0.001 0.000 0.001 0.519 0.503 0.521 0.503 326 Nator veh	33111	Anima roou manuacturing	0.009	0.008	0.429	0.434	0.315	0.555	
3221 Puip, paper and paper do ranifs 0.007 0.041 0.33 0.26 0.356 3222 Resin, synthetic rubber, and artificial and synthetic fibres and filaments 0.005 0.013 0.519 0.635 0.254 0.584 3118 Bakeries and tortilla manufacturing 0.004 0.001 0.519 0.635 0.254 0.584 3118 Bakeries and tortilla manufacturing 0.004 0.001 0.510 0.269 0.27 0.462 3116 Meat product manufacturing 0.004 0.001 0.510 0.269 0.27 0.462 3116 Meat product manufacturing 0.002 0.001 0.479 0.401 0.41 0.421 0.34 3252 Resin, coating and adhesive manufacturing 0.002 0.001 0.479 0.415 0.34 0.508 3361 Motor vehicle body and trailer manufacturing 0.002 0.001 0.479 0.415 0.344 0.503 3361 Motor vehicle manufacturing 0.000 0.000 0.444 0.722 0.333 0.611 3121 Beverage manufacturing	3251	Basic chemical manufacturing	0.008	0.013	0.432	0.414	0.296	0.402	
3252 Resin, synthetic rubber, and artificial and synthetic fibres and filaments 0.005 0.011 0.47 0.669 0.554 0.54 3118 Food manufacturing 0.005 0.013 0.519 0.633 0.348 0.42 0.334 3148 Food manufacturing 0.004 0.008 0.353 0.348 0.42 0.334 3149 Petroleum and coal product manufacturing 0.004 0.001 0.591 0.269 0.27 0.462 3150 Meat product manufacturing 0.002 0.001 0.579 0.421 0.594 0.488 3252 Paint, coating and adhesive manufacturing 0.002 0.001 0.479 0.413 0.608 3364 Aerospace product and parts manufacturing 0.002 0.001 0.444 0.511 0.344 0.364 3352 Motor vehicle body and trailer manufacturing 0.001 0.007 0.59 0.503 0.511 0.503 3361 Motor vehicle manufacturing 0.000 0.001 0.581 0.594 0.513 0.54 3365 Ship and boat building 0.501<	3221	Pulp, paper and paperboard mills	0.007	0.001	0.441	0.33	0.26	0.356	
3118 Food manufacturing 0.005 0.013 0.519 0.635 0.244 0.584 3118 Bakeries and tortilla manufacturing 0.004 0.008 0.333 0.348 0.42 0.334 3118 Bakeries and tortilla manufacturing 0.004 0.001 0.501 0.269 0.27 0.462 3116 Meat product manufacturing 0.002 0.001 0.579 0.407 0.584 0.307 3116 Meat product manufacturing 0.002 0.001 0.579 0.421 0.594 0.482 3164 Aerospace product and parts manufacturing 0.002 0.001 0.479 0.415 0.344 0.503 3362 Motor vehicle body and trailer manufacturing 0.002 0.001 0.479 0.415 0.503 0.563 3361 Motor vehicle manufacturing 0.001 0.000 0.444 0.722 0.333 0.611 3115 Dairy product manufacturing 0.000 0.000 0.444 0.453 0.463 0.443 3366 Ship and boat building 0.494 0.451 0.514 <td>3252</td> <td>Resin, synthetic rubber, and artificial and synthetic fibres and filaments</td> <td>0.005</td> <td>0.001</td> <td>0.47</td> <td>0.669</td> <td>0.536</td> <td>0.64</td>	3252	Resin, synthetic rubber, and artificial and synthetic fibres and filaments	0.005	0.001	0.47	0.669	0.536	0.64	
3118 Bakeries and tortille manufacturing 0.004 0.008 0.333 0.344 0.42 0.344 324 Petroleum and coal product manufacturing 0.004 0.001 0.501 0.269 0.27 0.462 3255 Paint, coating and adhesive manufacturing 0.002 0.001 0.579 0.421 0.594 0.488 3364 Aerospace product and parts manufacturing 0.002 0.001 0.479 0.414 0.364 3364 Aerospace product and parts manufacturing 0.002 0.001 0.479 0.411 0.414 0.364 3255 Motor vehicle body and trailer manufacturing 0.001 0.007 0.59 0.503 0.521 0.503 3261 Motor vehicle manufacturing 0.001 0.001 0.444 0.722 0.334 0.611 3271 Beverage manufacturing 0.000 0.001 0.581 0.595 0.114 0.344 3115 Dairy product manufacturing 0.000 0.001 0.581 0.456 0.324 3328 Coating, engraving, heat treating and allied activities 0.014 0.	311R	Food manufacturing	0.005	0.013	0.519	0.635	0.254	0.584	
324 Petroleum and coal product manufacturing 0.004 0.001 0.501 0.269 0.27 0.462 3116 Meat product manufacturing 0.002 0.001 0.579 0.407 0.594 0.488 3255 Paint, coating and ahesive manufacturing 0.002 0.001 0.579 0.421 0.594 0.488 3364 Aerospace product and parts manufacturing 0.002 0.001 0.494 0.611 0.413 0.608 3364 Motor vehicle body and trailer manufacturing 0.001 0.007 0.59 0.503 0.521 0.503 3364 Motor vehicle manufacturing 0.001 0.007 0.59 0.503 0.521 0.503 3361 Motor vehicle manufacturing 0.001 0.001 0.59 0.59 0.513 0.514 0.513 0.514 3115 Dairy product manufacturing 0.000 0.001 0.514 0.454 0.331 0.48 3366 Ship and boat building 0.501 0.613 0.324 0.324 337 Unweighted mean across industries 0.008 0.433	3118	Bakeries and tortilla manufacturing	0.004	0.008	0.353	0.348	0.42	0.334	
3116 Meat product manufacturing 0.002 0.001 0.297 0.407 0.187 0.307 3255 Paint, coating and adhesive manufacturing 0.002 0.001 0.579 0.421 0.513 0.488 3364 Aerospace product and parts manufacturing 0.002 0.001 0.479 0.415 0.434 0.503 3362 Motor vehicle body and trailer manufacturing 0.001 0.007 0.59 0.503 0.521 0.503 3254 Pharmaceutical and medicine manufacturing 0.001 0.007 0.59 0.503 0.511 0.503 3151 Dairy product manufacturing 0.000 0.001 0.51 0.559 0.114 0.348 3163 Ship and bast building 0.000 0.001 0.016 0.451 0.452 0.324 3164 Ship and bast building 0.001 0.001 0.006 0.451 0.453 0.463 0.463 0.463 0.463 0.463 0.451 0.452 317 Unweighted mean across industries 0.668 0.437 0.451 0.452 0.452 0.457 </td <td>324</td> <td>Petroleum and coal product manufacturing</td> <td>0.004</td> <td>0.001</td> <td>0.501</td> <td>0.269</td> <td>0.27</td> <td>0.462</td>	324	Petroleum and coal product manufacturing	0.004	0.001	0.501	0.269	0.27	0.462	
3255 Paint, coating and adhesive manufacturing 0.002 0.001 0.579 0.421 0.594 0.488 3364 Acrospace product and parts manufacturing 0.002 0.001 0.484 0.611 0.413 0.608 3254 Motor vehicle body and trailer manufacturing 0.002 0.001 0.479 0.503 0.521 0.503 3261 Motor vehicle manufacturing 0.001 0.000 0.001 0.59 0.503 0.511 0.503 3261 Motor vehicle manufacturing 0.000 0.000 0.644 0.722 0.334 0.611 3211 Beverage manufacturing 0.000 0.001 0.581 0.595 0.114 0.344 3150 Dairy product manufacturing 0.000 0.001 0.581 0.494 0.331 0.48 3328 Coating, engraving, heat treating and allied activities -0.001 0.065 0.448 0.451 0.345 0.324 3328 Coating, engraving, heat treating and allied activities 0.0468 0.463 0.511 0.371 0.452 Unweighted mean across industries <t< td=""><td>3116</td><td>Meat product manufacturing</td><td>0.002</td><td>0.001</td><td>0.297</td><td>0.407</td><td>0.187</td><td>0.307</td></t<>	3116	Meat product manufacturing	0.002	0.001	0.297	0.407	0.187	0.307	
3364 Aerospace product and parts manufacturing 0.002 0.001 0.484 0.611 0.413 0.608 3362 Motor vehicle body and trailer manufacturing 0.002 0.001 0.479 0.415 0.344 0.503 3361 Motor vehicle manufacturing 0.001 0.000 0.444 0.722 0.333 0.611 3121 Beverage manufacturing 0.000 0.000 0.014 0.722 0.333 0.611 3121 Beverage manufacturing 0.000 0.001 0.581 0.559 0.114 0.348 3150 bity product manufacturing 0.000 0.001 0.036 0.435 0.406 0.613 0.324 3366 Ship and boat building -0.001 0.006 0.435 0.406 0.163 0.324 3362 Coating, engraving, heat treating and allied activities NA NA NA 0.451 0.452 0.455 10weighted mean across industries 0.068 0.433 0.453 0.501 0.371 0.452 10weighted median across industries 0.456 0.511 0.351 <td>3255</td> <td>Paint, coating and adhesive manufacturing</td> <td>0.002</td> <td>0.001</td> <td>0.579</td> <td>0.421</td> <td>0.594</td> <td>0.488</td>	3255	Paint, coating and adhesive manufacturing	0.002	0.001	0.579	0.421	0.594	0.488	
3322 Motor vehicle body and trailer manufacturing 0.002 0.01 0.479 0.415 0.344 0.364 3254 Pharmaceutical and medicine manufacturing 0.001 0.007 0.59 0.503 0.521 0.503 3361 Motor vehicle manufacturing 0.000 0.000 0.444 0.722 0.333 0.611 3121 Beverage manufacturing 0.000 0.000 0.018 0.458 0.494 0.331 0.48 3115 Dairy product manufacturing 0.000 0.001 0.581 0.406 0.163 0.324 3328 Coating, engraving, heat treating and allied activities 0.068 0.433 0.463 0.591 0.371 0.452 Unweighted median across industries 0.068 0.043 0.453 0.511 0.371 0.452 Unweighted median across industries 0.068 0.043 0.453 0.453 0.457 Correlation inthroage in Chinese import share 0.635 0.144 0.453 0.453 0.457 Correlation interve informer timport share 0.635 0.175 0.236 0.231 <	3364	Aerospace product and parts manufacturing	0.002	0.001	0.484	0.611	0.413	0.608	
3254 Pharmaceutical and medicine manufacturing 0.001 0.007 0.59 0.502 0.502 0.503 0.521 0.503 3361 Motor vehicle manufacturing 0.001 0.000 0.444 0.722 0.333 0.611 3121 Beverage manufacturing 0.000 0.001 0.581 0.559 0.114 0.348 3151 Dairy product manufacturing 0.000 0.001 0.810 0.559 0.114 0.348 3366 Ship and boat building -0.001 0.006 0.435 0.406 0.163 0.324 3362 Coating, engraving, heat treating and allied activities NA NA 0.151 0.388 0.122 0.245 Unweighted mean across industries 0.068 0.043 0.463 0.501 0.371 0.452 Unweighted mean across industries 0.045 0.014 0.453 0.511 0.371 0.452 Unweighted mean across industries 0.045 0.014 0.453 0.511 0.371 0.452 Unweighted mean across industries 0.045 0.014 0.453 0.511 0.371 0.452 Correlation inforwation outcome, strategy) Correlation inforwation outcome, strategy) 0.266 <td>3362</td> <td>Motor vehicle body and trailer manufacturing</td> <td>0.002</td> <td>0.001</td> <td>0.479</td> <td>0.415</td> <td>0 344</td> <td>0 364</td>	3362	Motor vehicle body and trailer manufacturing	0.002	0.001	0.479	0.415	0 344	0 364	
3234 Prioritization inclustrationing 0.001 0.007 0.33 0.53 0.53 0.53 0.53 3261 Motor vehicle manufacturing 0.000 0.000 0.044 0.722 0.333 0.611 3121 Beverage manufacturing 0.000 0.001 0.581 0.559 0.114 0.348 3151 Dairy product manufacturing 0.000 0.000 0.034 0.494 0.331 0.48 3366 Ship and boat building -0.001 0.006 0.435 0.406 0.163 0.324 3328 Coating, engraving, heat treating and alled activities NA NA 0.151 0.388 0.122 0.245 Unweighted mean across industries 0.068 0.014 0.453 0.511 0.371 0.452 Unweighted media across industries 0.045 0.014 0.453 0.513 0.345 0.457 Correlation influence infort share 0.045 0.175 -0.236 0.231 -0.029 Correlation influence informavation outcomes/trategies 0.265 0.365 0.359 0.365 0.345 </td <td>2254</td> <td>Desenventies and medicine manufacturing</td> <td>0.001</td> <td>0.007</td> <td>0.50</td> <td>0.503</td> <td>0.531</td> <td>0.503</td>	2254	Desenventies and medicine manufacturing	0.001	0.007	0.50	0.503	0.531	0.503	
3501 Motor Verifice initiatuating 0.000 0.000 0.001 0.722 0.333 0.011 3121 Beverage manufacturing 0.000 0.001 0.581 0.559 0.114 0.348 3115 Dairy product manufacturing 0.000 0.001 0.581 0.484 0.494 0.331 0.48 3366 Ship and boat building -0.001 0.006 0.435 0.406 0.163 0.324 3378 Coating, engraving, heat treating and allied activities NA NA 0.463 0.501 0.371 0.452 Unweighted median across industries 0.068 0.043 0.463 0.501 0.371 0.452 Unweighted median across industries 0.045 0.044 0.453 0.453 0.457 Correlation inforwation outcome, strategy) Correlation inforwation outcome, strategy) 0.345 0.457 0.345 Correlation performed information outcome, strategy) 0.265 0.175 -0.236 0.231 -0.029	3234	Printing Cutter and medicine manufacturing	0.001	0.007	0.39	0.505	0.321	0.505	
3121 Deverage manufacturing 0.000 0.001 0.581 0.559 0.14 0.348 315 Daily product manufacturing 0.000 0.003 0.448 0.431 0.48 3366 Ship and boat building -0.001 0.006 0.435 0.406 0.163 0.324 3362 Coating, engraving, heat treating and allied activities NA NA 0.151 0.388 0.225 Unweighted mean across industries 0.068 0.043 0.463 0.501 0.371 0.452 Unweighted median across industries 0.068 0.014 0.455 0.513 0.457 0.457 Correlation (innovation outcome, strategy) Correlation (innovation outcome, strategy) 0.457 0.266 0.231 -0.029 Correlation performant outcome, strategy) 0.265 0.152 0.356 -1.029	3301	Notor venicie manufacturing	0.000	0.000	0.444	0.722	0.333	0.011	
3115 Uarry product manuracturing 0.000 0.003 0.48 0.494 0.331 0.48 3366 Ship and boat building -0.001 0.006 0.435 0.406 0.163 0.324 3368 Coating, engraving, heat treating and allied activities NA NA 0.48 0.494 0.331 0.48 Unweighted mean across industries 0.006 0.433 0.406 0.122 0.245 Unweighted median across industries 0.068 0.043 0.463 0.501 0.371 0.452 Correlation with change in Chinese import share 0.0635 0.014 0.455 0.513 0.345 0.457 Correlation introvation outcome, strategy) Correlation performed ufferent introparating outcomes/strategies 0.265 0.215 0.235 -0.236 0.231 -0.029	3121	beverage manuracturing	0.000	0.001	0.581	0.559	0.114	0.348	
3366 Ship and boat building -0.01 0.066 0.435 0.406 0.163 0.324 3328 Coating, engraving, heat treating and allied activities NA NA 0.151 0.388 0.122 0.245 Unweighted mean across industries 0.068 0.043 0.643 0.501 0.371 0.452 Unweighted mean across industries 0.065 0.041 0.453 0.513 0.345 0.457 Correlation with change in Chinese import share 0.635 0.175 -0.236 0.231 -0.029 Correlation (innovation outcome, strategy)	3115	Dairy product manufacturing	0.000	0.003	0.448	0.494	0.331	0.48	
3328 Coating, engraving, heat treating and allied activities NA NA 0.151 0.388 0.122 0.245 Unweighted mean across industries 0.068 0.043 0.463 0.501 0.371 0.452 Unweighted median across industries 0.045 0.045 0.014 0.455 0.513 0.345 0.457 Correlation with change in Chinese import share 0.635 0.175 -0.236 0.231 -0.029 Correlation (innovation outcome, strategy) 5 0.365 0.175 0.395 0.363	3366	Ship and boat building	-0.001	0.006	0.435	0.406	0.163	0.324	
Unweighted mean across industries 0.068 0.043 0.463 0.501 0.371 0.452 Unweighted median across industries 0.045 0.014 0.455 0.513 0.345 0.457 Correlation with change in Chinese import share 0.635 0.175 -0.236 0.231 -0.029 Correlation (innovation outcome, strategy) 5.702 0.395 0.363 0.262 0.363	3328	Coating, engraving, heat treating and allied activities	NA	NA	0.151	0.388	0.122	0.245	
Unweighted mean across industries 0.068 0.043 0.631 0.371 0.452 Unweighted median across industries 0.045 0.014 0.453 0.513 0.345 0.457 Correlation with change in Chinese import share 0.63 0.17 -0.236 0.231 -0.029 Correlation (innovation outcome, strategy) 5.70 0.395 -									
Unweighted median across industries 0.045 0.014 0.455 0.513 0.345 0.457 Correlation with change in Chinese import share 0.635 0.17 -0.236 0.231 -0.029 Correlation (innovation outcome, strategy) - 0.72 0.395 - Correlation between different innovation outcomes/(trateeies 0.362 0.72 0.363 0.363		Unweighted mean across industries	0.068	0.043	0.463	0.501	0.371	0.452	
Correlation with change in Chinese Import share 0.635 0.175 -0.236 0.231 -0.029 Correlation (innovation outcome, strategy) 0.702 0.395 -0.236 0.363		Unweighted median across industries	0.045	0.014	0.455	0.513	0.345	0.457	
Correlation (innovation outcomes/strategies 0,702 0,395		Correlation with change in Chinese import share		0.635	0.175	-0.236	0.231	-0.029	
Correlation between different innovation quitomes/strategies 0,72 0,253		Correlation (innovation outcome, strategy)			0.702	0.395		-	
		Correlation between different innovation outcomes/strategies				0.262		0 363	

Notes : We report trade flows and innovation measures using the 3/4-digit NAICS aggregation (59 industries) from the 2009 Survey of Innovation and Business Strategy (SIBS) public-release data. Innovation outcomes are self-reported by firms as introducing "New or significantly improved goods" or "New or significantly improved method of manufacturing or production" over the last 3 years. Innovation strategics are self-reported by firms as "Introduce new or significantly improved goods" or services regularly" and "Introduce new or significantly improved business activities or processes to its operations for the long term" in response to questions about the strategic focus of the enterprise with respect to its "goods or services" or "operations or business activities." The omitted categories for strategies are "maintain or expand the sales of existing goods or services" and "maintain or optimize current operations and business activities for the long term".

Table A2: Autor-Dorn-Hans	on IV										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Change i comp	n Chinese etition	Change in perceived non-US competition	Number of Process Innov.	Number of Product Innov.	Number of exclusive Process Innov.	Number of exclusive Product Innov.	Change in Strategy: Process innovation	Change in Strategy: Product innovation	Future Exit	Change in Profits
Dependent variable	IV First Stage	IV First Stage	IV	IV	IV	IV	IV	IV	IV	IV	IV
Change in Chinese											
competition			5.169	-12.741	-2.949	-1.288	3.706	0.358	0.511	0.807	-1.096
			(1.905)	(4.013)	(4.050)	(0.721)	(1.295)	(0.401)	(0.321)	(0.320)	(0.915)
Initial Chinese import share											
X aggregate change in Chinese imports to Europe	0.662	0.665									
	(0.085)	(0.052)									
Population sampling weights	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Observations	859	1,354	863	908	908	908	908	863	863	1,354	859
R-squared	0.492	0.625	0.035	0.021	0.008	-0.001	0.002	0.005	0.007	0.007	-0.000

Notes: Column (1) displays IV first stage for firms that survive until 2005, while column (2) is the IV first stage for all initial firms in 1999. Column (3) uses a 1-5 Likert scale, measuring the intensity of perceived non-US international competition. Columns (4) and (5) use number of innovations, which are counts of the number of years that firms reported either process or product innovations (summing across "new" and "improved"). Columns (6) and (7) use exclusive number of innovations include either only process or only product innovations, excluding innovations that occurred in years with both product and process innovations. Colimns (8) and (9) use process or product innovation strategy, measured as relative priority of product or process innovation for business strategy in survey responses. Column (10) uses future exit, which measures either firm bankruptcy or plant shutdown in the years after 1999 but neither survey attrition nor M&A activity. Profits in colum (11) are defined as operating revenue minus operating cost relative to initial profits. All regressions use population sampling weights, which make estimates representative of approximately 57,000 Canadian manufacturing firms. Robust standard errors in parentheses are clustered by 4-digit NAICS industry.

	(1)	(2)	(3)	(4)
	Number of Product Innov.	Number of Process Innov.	Number of exclusive Product Innov.	Number of exclusive Process Innov.
Dependent variable	IV	IV	IV	IV
Change in Chinese Competition	3.096	-9.503	5.102	-1.364
	(5.353)	(3.396)	(1.600)	(0.787)
Share of firms with product innovation in 1999	1.807		0.454	
	(0.544)		(0.144)	
revenue	0.449 (0.140)	0.491 (0.121)	-0.051 (0.034)	0.057 (0.033)
Share of firms with process innovation in 1999		0.502		-0.102
		(0.738)		(0.115)
Observations R-squared	886 0.067	886 0.081	886 0.019	886 0.015

Table A3: Innovation outcomes controlling for initial industry differences

Notes: Number of innovations are counts of the number of years that firms reported either process or product innovations (summing across "new" and "improved"). Exclusive number of innovations is the number of years in which there were product or process innovations (new or improved) but excluding years in which both types of innovations occurred. Process or product innovation strategy is measured as relative priority of product or process innovation for business strategy in survey responses. All regressions use population sampling weights, which make estimates representative of approximately 57,000 Canadian manufacturing firms. Robust standard errors in parentheses are clustered by 4-digit NAICS industry.

	Initial perceived non- US, international	Change in perceived non-US, international	Future perceived non-US, international
	competition	competition	competition
Dependent variable	(in 1999)	(1999-2005)	(in 2005)
	(1)	(2)	(3)
Proc. Innovation strategy (in 1999)	0.510	0.199	0.322
	(0.301)	(0.348)	(0.275)
Prod. Innovation strategy (in 1999)	0.058	-0.126	-0.023
	(0.275)	(0.313)	(0.226)
Low cost strategy (in 1999)	-0.077	0.229	0.150
	(0.126)	(0.194)	(0.114)
Observations	1,359	863	863
R-squared	0.016	0.004	0.390

Table A4: Initial strategies and perceived non-US international competition

Notes: The dependent variable in column (1) measures firm-level perceived intensity of non-US international competition on a Likert scale from 1-5 in 1999. Column (2) measures the change in the firm-level perceived intensity of non-US international competition from 1999 to 2005. Column (3) is measured by using the change in non-US international competition and controlling for initial perception of non-US international competition.

Table A5: Long run industry-level responses

	Strategic	Strategic responses		on responses	
	2001	-2012	2001-2012		
	Share of firms with Process innovation strategy	Share of firms with Product innovation strategy	Share of firms with Process innovations in last 3 years	Share of firms with Product innovations in last 3 years	
Dependent variable	(1)	(2)	(3)	(4)	
	IV	IV	IV	IV	
Change in Chinese					
Competition	-1.677	-0.950	-1.594	-0.021	
	(0.936)	(0.623)	(0.498)	(0.411)	
Observations	151	151	151	151	
R-squared	0.012	-0.007	0.003	0.000	

Notes: Sample combines data from the WES and the SIBS. Results are at approximately the NAICS 4-digit industrylevel with industry and year fixed effects included in all specifications. The overall time horizon is 2001 to 2012 with non-overlapping sample periods of 2001-2005, 2005-2009, 2009-2012. Variables and samples are defined to be common across data sets. Innovation strategy is based on whether the firm records the strategy as important. The innovation variable is based on any reported innovation in the past 3 years. Robust standard errors in parentheses are clustered by 4-digit NAICS industry. ***, **, * mark significance at the 1, 5, and 10 percent level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Change in number of Process innov.	Change in number of Product innov.	Change in number of exclusive Process Innov.	Change in number of exclusive Product Innov.	Change in Strategy: Process innovation	Change in Strategy: Product innovation
Dependent variable	IV	IV	IV	IV	IV	IV
Chinese competition	-9.482 (3.085)	2.051 (4.717)	-1.467 (0.759)	4.687 (1.477)	0.290 (0.379)	0.444 (0.275)
Population sampling weights	YES	YES	YES	YES	YES	YES
Observations R-squared	740 0.024	740 -0.009	740 -0.002	740 -0.012	704	704 0.006

Table A6: Average innovation and strategy responses, excluding foreign-owned firms

Notes: Number of innovations are counts of the number of years that firms reported either process or product innovations (summing across "new" and "improved"). Exclusive number of innovations include either only process or only product innovations, excluding innovations that include both product and process innovations. Process or product innovation strategy is measured as relative priority of product or process innovation for business strategy in survey responses. All regressions use population sampling weights, which make estimates representative of approximately 57,000 Canadian manufacturing firms. Robust standard errors in parentheses are clustered by 4-digit NAICS industry.