

Openness, Global Value Chains, and Productivity

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 - iPhone's software and product design are done by Apple, most parts are produced by independent suppliers around the world (Xing, 2011)
- As a result of the fragmentation of production processes across countries, **intermediates account for 2/3 of total trade** (Johnson and Noguera, 2012).

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- **Firm-level tests** of these theories are still relatively **sparse**.

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 - Productivity of final good producers with fixed costs of integration ▶

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- Using Input-Output tables, we also construct new **measure of upstreamness** of each input i in the production of final good j .) [▶ example](#)
- Exploiting **variation across and within firms**, we find **strong support for our model's predictions** concerning how integration choices depend on
 - elasticity of demand for the final good
 - profile of contractibility of the inputs along the value chain
 - firm productivity
- In general, the firm-level patterns that we uncover suggest that **contractual frictions** critically shape firms' ownership decisions along their value chains.

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- Recent decades have seen the proliferation of **regional trade agreements**
90% are Free Trade Agreements (FTAs) [▶ RTAs](#)
- **FTAs** can **distort sourcing decisions** through two channels:
 - **Lower tariffs** when importing from FTA partners
 - **Rules of Origin (RoO)**

Some information about RoO

- RoO define the **conditions that products must satisfy to obtain preferential tariff treatment**, to avoid that products from non-FTA members are transhipped from low-tariff to high-tariff FTA partners.

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- There are two main types of rules:
 - 1 Value-added requirements
 - At least $X\%$ of the the value of the final good must be “domestic” VA
 - 2 Change of tariff classification
 - Some inputs cannot be sourced (at all) from outside the FTA

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- Theoretically, it has long been known that RoO **distort sourcing** and lead to **trade diversion in intermediate goods** (e.g. Grossman, 1981).
- In a large survey by the ITC (2015), RoO emerge as the **most problematic non-tariff measure** faced by manufacturing firms.

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 - RoO are written at a very disaggregated level
 - RoO are mostly defined in terms of change of tariff classification
 - **Endogeneity of the rules**
 - We run **difference-in-differences regressions**, focusing on **Mexican imports** (NAFTA RoO were to a large extent inherited from CUSFTA)
 - We use **CUSFTA RoO as an instrument**
 - We run **triple-difference regressions** exploiting variation in RoO treatment between NAFTA and non-NAFTA countries

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- RoO decreased the growth of Mexican imports of restricted intermediates from third countries by between 13 and 117 log points (representing between 5% and 52% of the actual change in imports of treated goods).
- Our results challenge those by Caliendo and Parro (2015): abstracting from RoO, they find that “the rest of the world was hardly affected by NAFTA.”

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- Input tariffs are low compared to tariffs on final goods (Miroudot *et al.*, 2009). Because of RoO, the **actual level of protection on intermediates** is much higher than what implied by input tariffs.
- Our analysis has important policy implications for

Multilateral trade rules (in particular GATT Article XXIV)

Brexit negotiations (in particular in the case of a UK-EU FTA)

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 - **Inward FDI?**

Study whether NAFTA sourcing restrictions led to “RoO-jumping” FDI, using disaggregated data on Mexican inward FDI.

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- Conconi *et al* (2017a): How does the global fragmentation of production affects the **political economy of trade policy**?
 - Theoretical model of lobbying à la Grossman and Helpman (1994, 1995) with firm heterogeneity à la Melitz (2003)
 - Empirical analysis using US firm-level data on lobbying in favor/against all the free trade agreements negotiated since 1995

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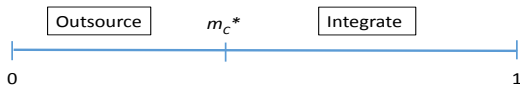
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- Conconi *et al* (2017b): what are the **implications of joining a multinational production network**? Using firm-level datasets from the Belgian National Bank, we plan to study the impact of foreign ownership on
 - global and domestic sourcing
 - product range
 - global and domestic sales
 - productivity

Thank you!

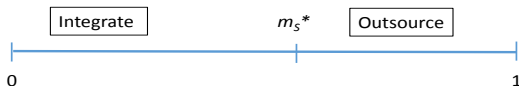
Core prediction: the role of demand elasticity

- Complements case ($\rho > \alpha$): Greater propensity to integrate *downstream*.
- Substitutes case ($\rho < \alpha$): Greater propensity to integrate *upstream*.

Sequential complements: $\rho > \alpha$



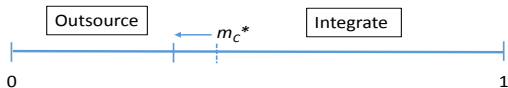
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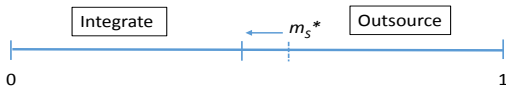
The role of contractibility

- A higher level of “upstream contractibility”
 - Complements case: *greater* propensity to integrate more upstream inputs.
 - Substitutes case: *lower* propensity to integrate more upstream inputs.

Sequential complements: $\rho > \alpha$



Sequential substitutes: $\rho < \alpha$

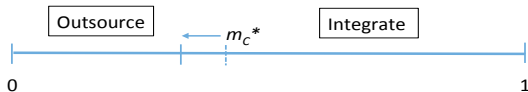


- Intuition: firms rely less on the organizational mode to counteract distortions associated with inefficient investments upstream.

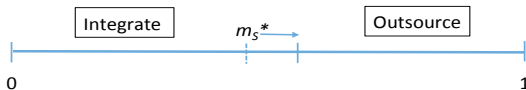
The role of productivity

- **More productive firms** are better able to spread their fixed costs over a greater output, hence they **integrate more stages**.

Sequential complements: $\rho > \alpha$



Sequential substitutes: $\rho < \alpha$



Measuring upstreamness

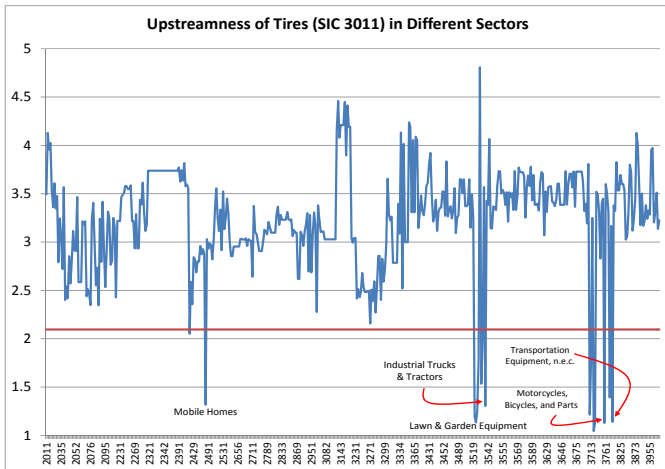
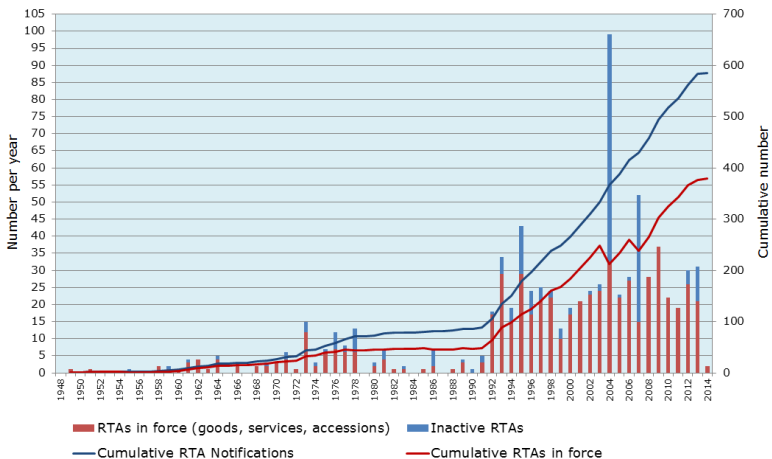


Figure 1: Number of RTA notifications and RTA in force (source, WTO Secretariat)



NAFTA Rules of Origin

- Example of RoO: **watches** (HS 91.02) can only be traded duty free among members if **watch movements** (HS 91.08), **watch straps** (HS 91.13) **watch cases** (HS 91.12) used to produce them are sourced within NAFTA.

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- We construct a **new dataset on NAFTA RoO**: for every final good, we can trace all the inputs that are subject to RoO requirements; similarly, for every intermediate good, we can link it to all final goods that impose RoO requirements on its sourcing. [▶ construction of RoO dataset](#)

Construction of dataset on NAFTA RoO

- Four steps to codify sourcing restrictions in NAFTA RoO:
 - 1 NAFTA RoO in Annex 401
 - 2 Coding Annex 401
 - 3 Mapping input-output linkages in NAFTA RoO
 - 4 Construction of RoO variables

Step 1: Annex 401

- **NAFTA RoO on textile fabric HS 6203.42 (men's or boys' trousers):**

“change[s] to subheadings 6203.41 through 6203.49 from any other chapter, except from headings 5106 through 5113, 5204 through 5212, 5307 through 5308 or 5310 through 5311, chapter 54, or heading 5508 through 5516, 5801 through 5802 or 6001 through 6002.”

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- In some cases, alternative or complementary **value added rules** are used, but only in combination with change of classification rules.

Step 2: Coding Annex 401

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Figure 2: RoO on HS 6203.42

Output	Rule Type	Alternative VA	Complementary VA	Main Input Req	AdReq 1	AdReq 2	AdReq 3
62.03.41-62.03.49	CC	0	0	chapter 62	51.06-51.13	52.04-52.12	53.07-53.08
62.04.11-62.04.13	CC	0	0	chapter 62	51.06-51.13	52.04-52.12	53.07-53.08

Step 3: Mapping output-input linkages in NAFTA RoO

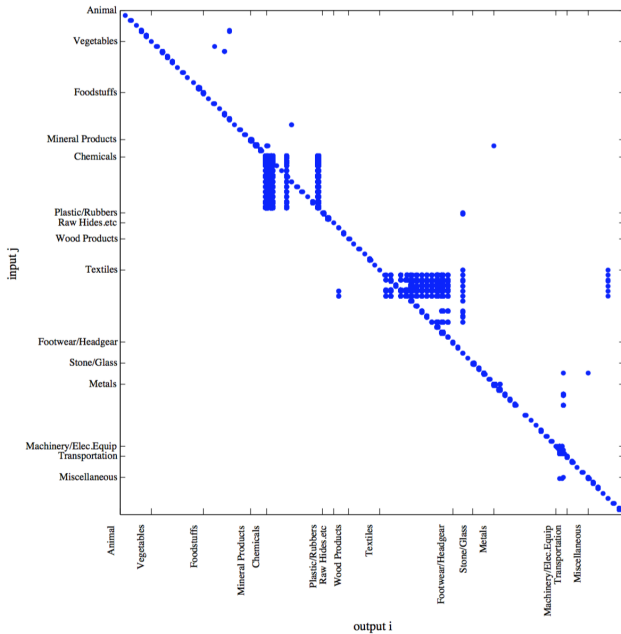
output	input
620342	550810
620342	550820
620342	550911
620342	550912
620342	550921
620342	550922
620342	550931
620342	550932
620342	550941
620342	550942
620342	550951
620342	550952
620342	550953
620342	550959
620342	550961
620342	550962
620342	550969
620342	550991
620342	550992

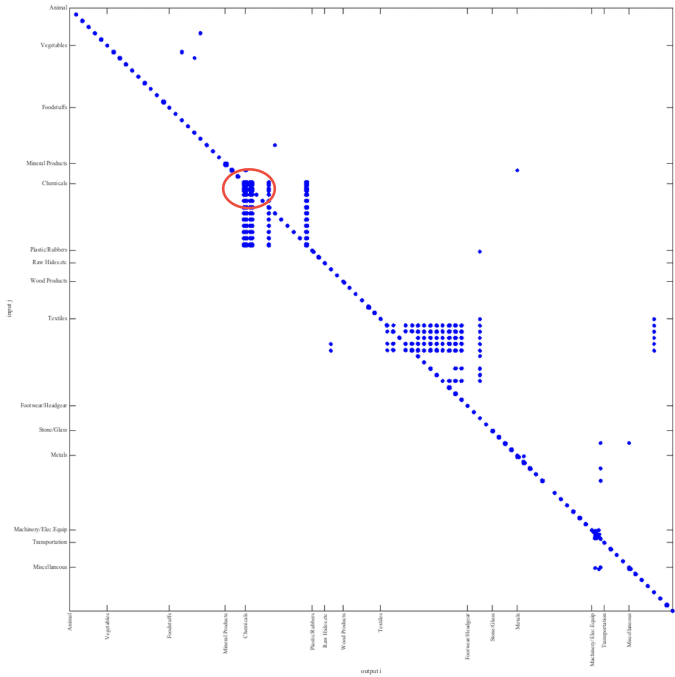
Step 4: Constructing RoO variables

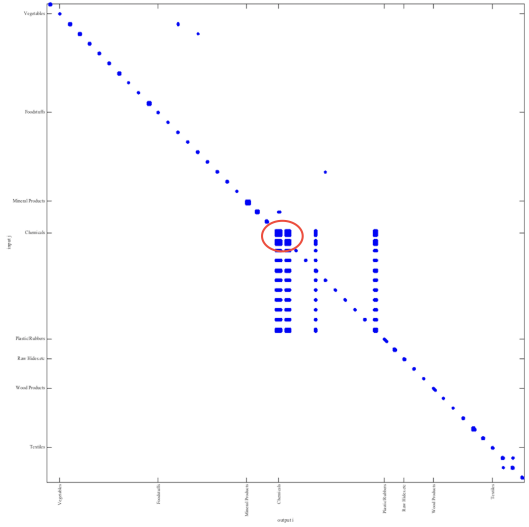
input	output
550810	620342
550810	620343
550810	620349
550810	620411
550810	620412
550810	620413
550810	620419
550810	620421
550810	620422
550810	620423
550810	620429
550810	620431
550810	620432
550810	620433
550810	620439
550810	620441
550810	620442

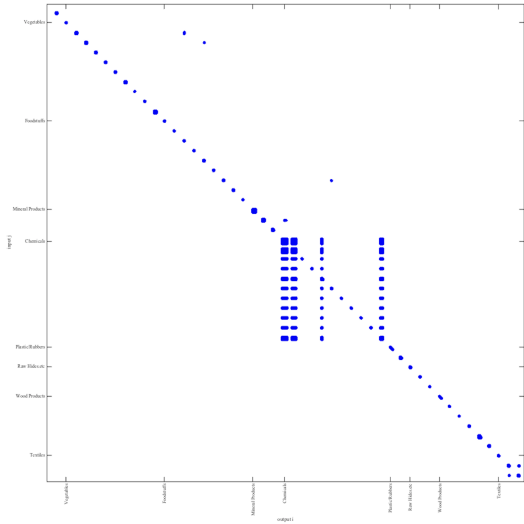
- RoO_{ij} : dummy equal to 1 is RoO on final good i restricts sourcing of j .

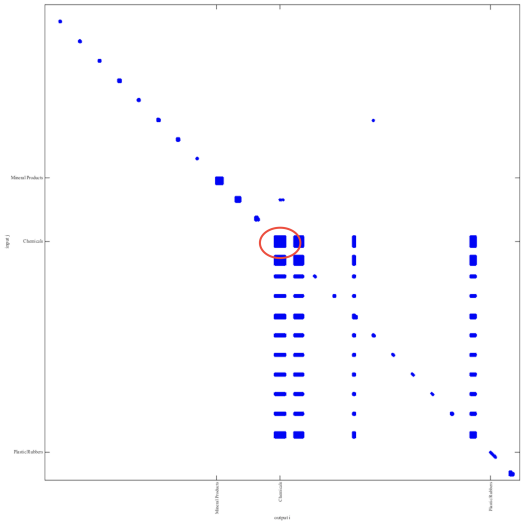
NAFTA Rules of Origin (RoO_{ij})

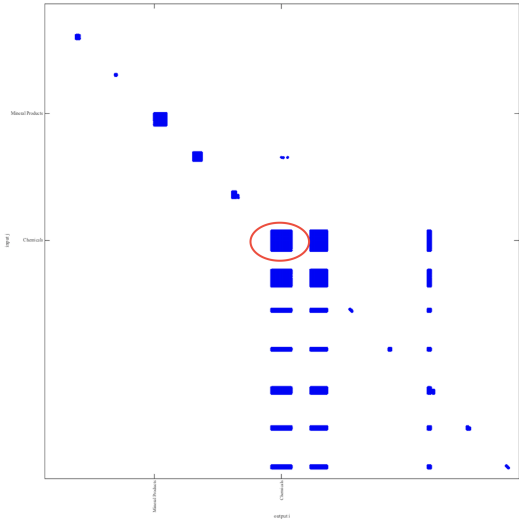


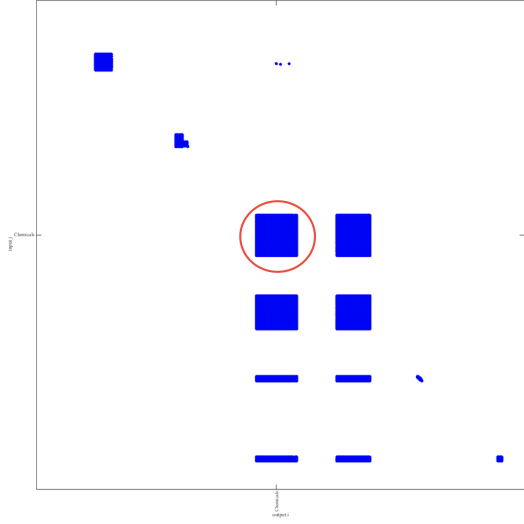


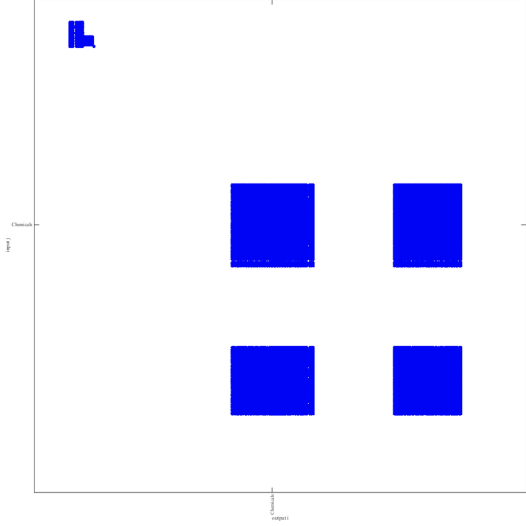


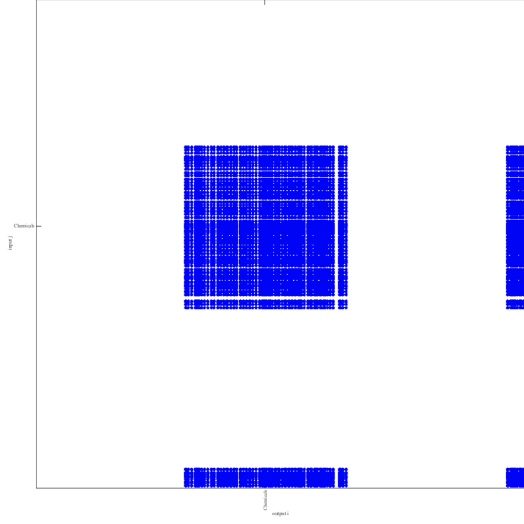


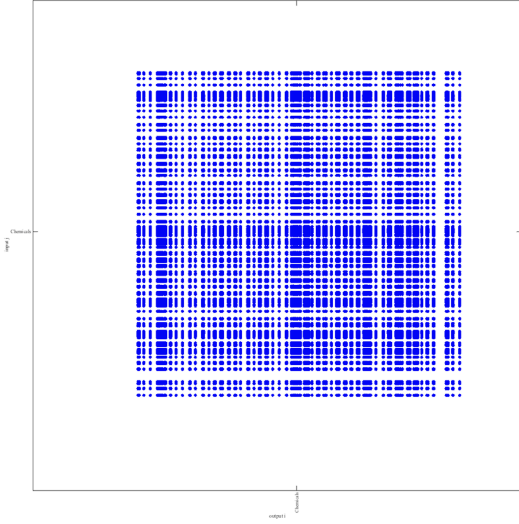


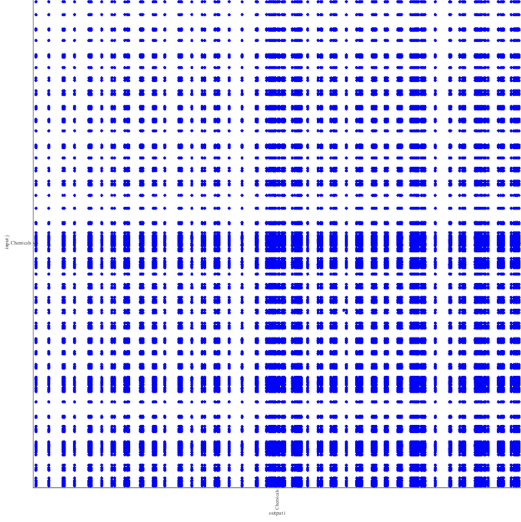


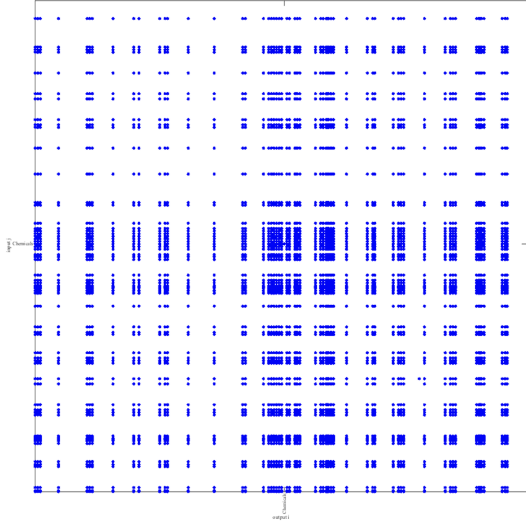


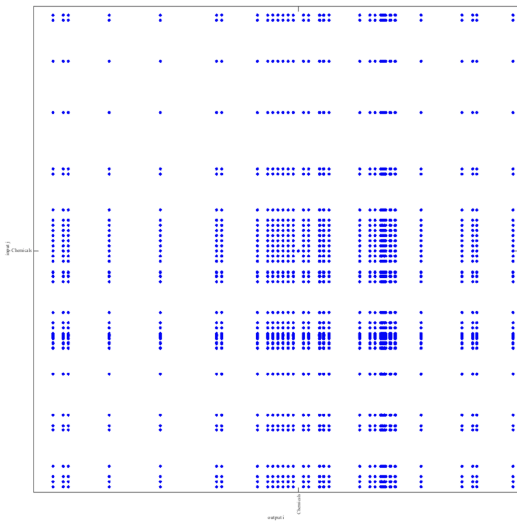


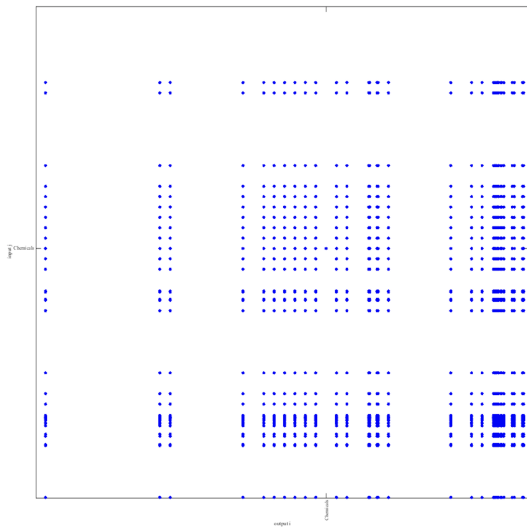


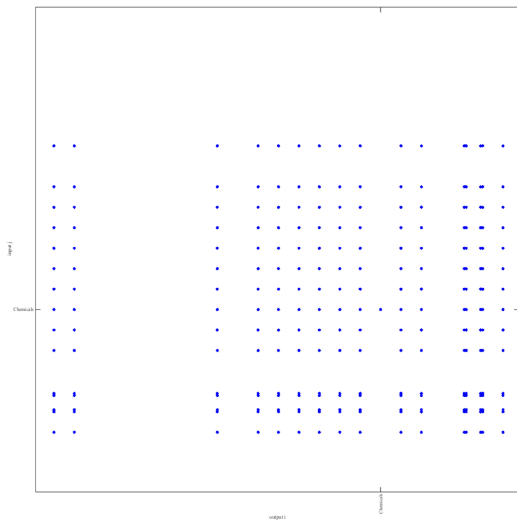


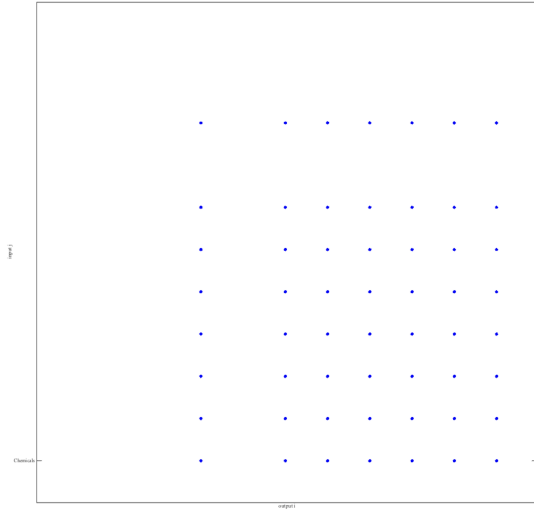


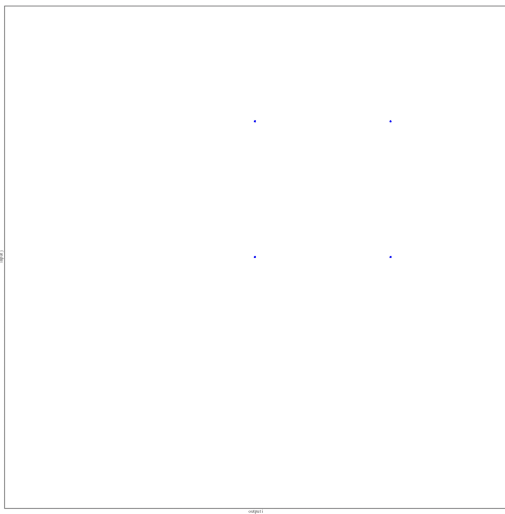












RoO variables

- Main treatment variables for a given intermediate good j :

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- $x = 3$ further excludes final goods i with alternative VA rules