

Discussion of

**Volatility in the Small and in the Large:
The Lack of Diversification in International Trade**

by Francis Kramarz, Julien Martin, and Isabelle Mejean

Felix Tintelnot

University of Chicago and NBER

LSE, London

June 19, 2017

Overall comments

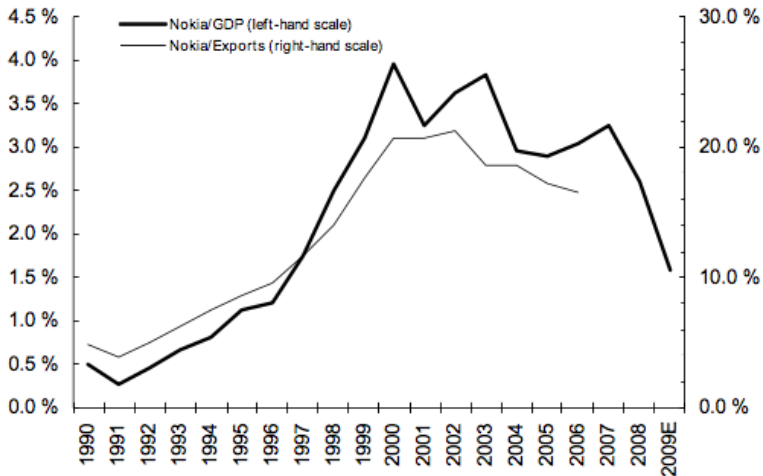
- ▶ Very interesting paper!

Overall comments

- ▶ Very interesting paper!
- ▶ New data:
 - ▶ Identity of foreign customers of French firms
- ▶ Interesting question:
 - ▶ How sensitive are country-level exports to micro-level shocks?
 - ▶ How well diversified are firms to shocks to their customers?

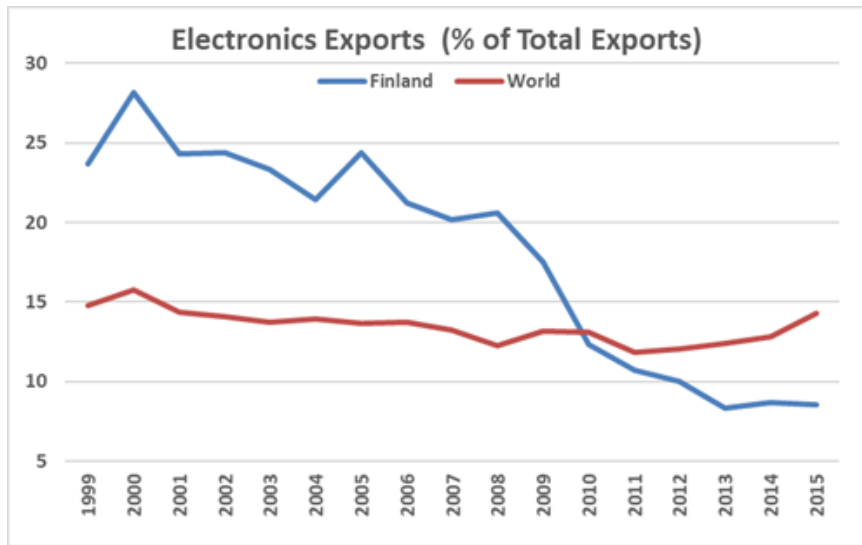
Nokia and Finland

Figure 1.1. Nokia as a share of exports and GDP, %



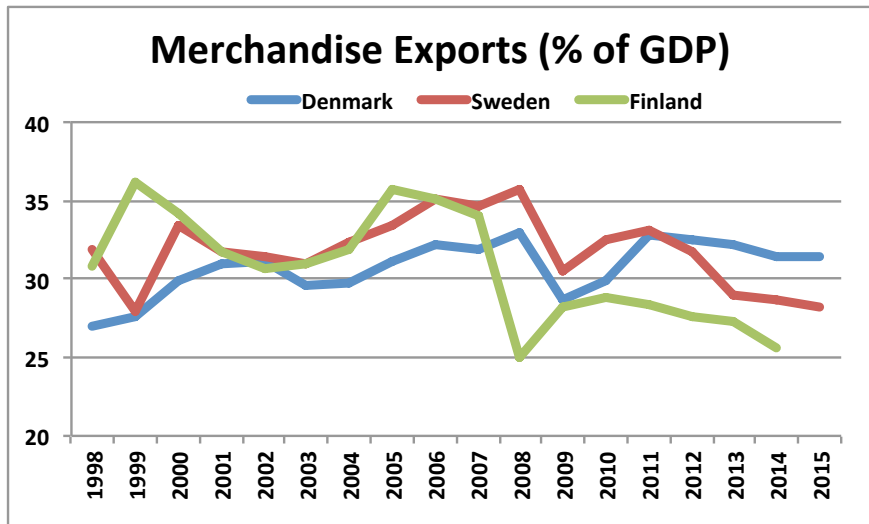
Source: ETLA - Research institute of the Finnish economy, 2010

Exports of electronics



Source: UN comtrade

Agg. exports from Finland



Source: UN comtrade and WEO database

Overview

- ▶ Findings:
 - ▶ Buyer-seller-specific shocks account for almost 2/3 of firm-destination-specific volatility in exports
 - ▶ Eliminating all micro shocks accounts for a greater reduction in agg. destination-specific sales than the elimination of destination-specific macro shock

- ▶ Main comments:
 - ▶ Model / Estimation of buyer-, seller-, and buyer-seller-specific shocks
 - ▶ Measurement
 - ▶ Does trade lead to more or less volatility?

Key equation in model

- Sales from seller $s(i)$ to buyer $b(j)$ at time t :

$$p_{s(i)b(j)t} x_{s(i)b(j)t} = \bar{\sigma} (Z_{it}/\omega_{it})^{\sigma-1} A_{jt} z_{s(i)t} z_{b(j)t}^{\tilde{\sigma}} z_{s(i)b(j)t}^{\sigma-1} \\ \times \left(\sum_i \sum_{s(i) \in \Omega_{b(j)t}} \left(\frac{\omega_{it}}{Z_{it} z_{s(i)t} z_{s(i)b(j)t}} \right)^{1-\sigma} \right)^{\frac{\sigma-\eta}{1-\sigma}}$$

Key equation in model

- ▶ Sales from seller $s(i)$ to buyer $b(j)$ at time t :

$$p_{s(i)b(j)t} x_{s(i)b(j)t} = \bar{\sigma} (Z_{it}/\omega_{it})^{\sigma-1} A_{jt} z_{s(i)t} z_{b(j)t}^{\tilde{\sigma}} z_{s(i)b(j)t}^{\sigma-1} \\ \times \left(\sum_i \sum_{s(i) \in \Omega_{b(j)t}} \left(\frac{\omega_{it}}{Z_{it} z_{s(i)t} z_{s(i)b(j)t}} \right)^{1-\sigma} \right)^{\frac{\sigma-\eta}{1-\sigma}}$$

- ▶ $\Omega_{b(j)t}$ is the *sourcing strategy* of buyer $b(j)$ at time t .

Key equation in model

- ▶ Sales from seller $s(i)$ to buyer $b(j)$ at time t :

$$p_{s(i)b(j)t} x_{s(i)b(j)t} = \bar{\sigma} (Z_{it}/\omega_{it})^{\sigma-1} A_{jt} z_{s(i)t} z_{b(j)t}^{\tilde{\sigma}} z_{s(i)b(j)t}^{\sigma-1} \\ \times \left(\sum_i \sum_{s(i) \in \Omega_{b(j)t}} \left(\frac{\omega_{it}}{Z_{it} z_{s(i)t} z_{s(i)b(j)t}} \right)^{1-\sigma} \right)^{\frac{\sigma-\eta}{1-\sigma}}$$

- ▶ $\Omega_{b(j)t}$ is the *sourcing strategy* of buyer $b(j)$ at time t .
- ▶ Key issue: $\Omega_{b(j)t}$ is endogenous
 - ▶ will be affected by shocks to $z_{s(i)b(j)\tau}$, $z_{s(i)\tau}$, $z_{b(j)\tau}$... $\tau \in \{t, t-1\}$

Key equation in model

- ▶ Sales from seller $s(i)$ to buyer $b(j)$ at time t :

$$p_{s(i)b(j)t} x_{s(i)b(j)t} = \bar{\sigma} (Z_{it}/\omega_{it})^{\sigma-1} A_{jt} z_{s(i)t} z_{b(j)t}^{\tilde{\sigma}} z_{s(i)b(j)t}^{\sigma-1} \\ \times \left(\sum_i \sum_{s(i) \in \Omega_{b(j)t}} \left(\frac{\omega_{it}}{Z_{it} z_{s(i)t} z_{s(i)b(j)t}} \right)^{1-\sigma} \right)^{\frac{\sigma-\eta}{1-\sigma}}$$

- ▶ $\Omega_{b(j)t}$ is the *sourcing strategy* of buyer $b(j)$ at time t .
- ▶ Key issue: $\Omega_{b(j)t}$ is endogenous
 - ▶ will be affected by shocks to $z_{s(i)b(j)\tau}$, $z_{s(i)\tau}$, $z_{b(j)\tau}$... $\tau \in \{t, t-1\}$
- ▶ Consider a positive shock to $z_{s(i)b(j)t}$, where $s(i) \in \Omega_{b(j)t}$

Key equation in model

- ▶ Sales from seller $s(i)$ to buyer $b(j)$ at time t :

$$p_{s(i)b(j)t} x_{s(i)b(j)t} = \bar{\sigma} (Z_{it}/\omega_{it})^{\sigma-1} A_{jt} z_{s(i)t} z_{b(j)t}^{\tilde{\sigma}} z_{s(i)b(j)t}^{\sigma-1} \\ \times \left(\sum_i \sum_{s(i) \in \Omega_{b(j)t}} \left(\frac{\omega_{it}}{Z_{it} z_{s(i)t} z_{s(i)b(j)t}} \right)^{1-\sigma} \right)^{\frac{\sigma-\eta}{1-\sigma}}$$

- ▶ $\Omega_{b(j)t}$ is the *sourcing strategy* of buyer $b(j)$ at time t .
- ▶ Key issue: $\Omega_{b(j)t}$ is endogenous
 - ▶ will be affected by shocks to $z_{s(i)b(j)\tau}$, $z_{s(i)\tau}$, $z_{b(j)\tau}$... $\tau \in \{t, t-1\}$
- ▶ Consider a positive shock to $z_{s(i)b(j)t}$, where $s(i) \in \Omega_{b(j)t}$
 - ▶ Suppose $\eta > \sigma$

Key equation in model

- ▶ Sales from seller $s(i)$ to buyer $b(j)$ at time t :

$$p_{s(i)b(j)t} x_{s(i)b(j)t} = \bar{\sigma} (Z_{it}/\omega_{it})^{\sigma-1} A_{jt} z_{s(i)t} z_{b(j)t}^{\tilde{\sigma}} z_{s(i)b(j)t}^{\sigma-1} \\ \times \left(\sum_i \sum_{s(i) \in \Omega_{b(j)t}} \left(\frac{\omega_{it}}{Z_{it} z_{s(i)t} z_{s(i)b(j)t}} \right)^{1-\sigma} \right)^{\frac{\sigma-\eta}{1-\sigma}}$$

- ▶ $\Omega_{b(j)t}$ is the *sourcing strategy* of buyer $b(j)$ at time t .
- ▶ Key issue: $\Omega_{b(j)t}$ is endogenous
 - ▶ will be affected by shocks to $z_{s(i)b(j)\tau}$, $z_{s(i)\tau}$, $z_{b(j)\tau}$... $\tau \in \{t, t-1\}$
- ▶ Consider a positive shock to $z_{s(i)b(j)t}$, where $s(i) \in \Omega_{b(j)t}$
 - ▶ Suppose $\eta > \sigma$
 - ▶ Marginal benefit of adding supplier $s(i) \notin \Omega_{b(j)t}$ increases

Key equation in model

- ▶ Sales from seller $s(i)$ to buyer $b(j)$ at time t :

$$p_{s(i)b(j)t} x_{s(i)b(j)t} = \bar{\sigma} (Z_{it}/\omega_{it})^{\sigma-1} A_{jt} z_{s(i)t} z_{b(j)t}^{\tilde{\sigma}} z_{s(i)b(j)t}^{\sigma-1} \\ \times \left(\sum_i \sum_{s(i) \in \Omega_{b(j)t}} \left(\frac{\omega_{it}}{Z_{it} z_{s(i)t} z_{s(i)b(j)t}} \right)^{1-\sigma} \right)^{\frac{\sigma-\eta}{1-\sigma}}$$

- ▶ $\Omega_{b(j)t}$ is the *sourcing strategy* of buyer $b(j)$ at time t .
- ▶ Key issue: $\Omega_{b(j)t}$ is endogenous
 - ▶ will be affected by shocks to $z_{s(i)b(j)\tau}$, $z_{s(i)\tau}$, $z_{b(j)\tau}$... $\tau \in \{t, t-1\}$
- ▶ Consider a positive shock to $z_{s(i)b(j)t}$, where $s(i) \in \Omega_{b(j)t}$
 - ▶ Suppose $\eta > \sigma$
 - ▶ Marginal benefit of adding supplier $s(i) \notin \Omega_{b(j)t}$ increases
 - ▶ Caused by a seller-buyer-specific shock, additional supplier(s) will increase purchases from all suppliers in $\Omega_{b(j)t}$

Key equation in model

- ▶ Sales from seller $s(i)$ to buyer $b(j)$ at time t :

$$p_{s(i)b(j)t} x_{s(i)b(j)t} = \bar{\sigma} (Z_{it}/\omega_{it})^{\sigma-1} A_{jt} z_{s(i)t} z_{b(j)t}^{\tilde{\sigma}} z_{s(i)b(j)t}^{\sigma-1} \\ \times \left(\sum_i \sum_{s(i) \in \Omega_{b(j)t}} \left(\frac{\omega_{it}}{Z_{it} z_{s(i)t} z_{s(i)b(j)t}} \right)^{1-\sigma} \right)^{\frac{\sigma-\eta}{1-\sigma}}$$

- ▶ $\Omega_{b(j)t}$ is the *sourcing strategy* of buyer $b(j)$ at time t .
- ▶ Key issue: $\Omega_{b(j)t}$ is endogenous
 - ▶ will be affected by shocks to $z_{s(i)b(j)\tau}$, $z_{s(i)\tau}$, $z_{b(j)\tau}$... $\tau \in \{t, t-1\}$
- ▶ Consider a positive shock to $z_{s(i)b(j)t}$, where $s(i) \in \Omega_{b(j)t}$
 - ▶ Suppose $\eta > \sigma$
 - ▶ Marginal benefit of adding supplier $s(i) \notin \Omega_{b(j)t}$ increases
 - ▶ Caused by a seller-buyer-specific shock, additional supplier(s) will increase purchases from all suppliers in $\Omega_{b(j)t}$
 - ▶ Additional supplier will be misinterpreted as a buyer-specific shock when ignoring the endogeneity of the buyer's sourcing strategy

Measurement: Identity of foreign buyers

- ▶ KMM list 74,427 buyers of French exports in Belgium in 2007

Measurement: Identity of foreign buyers

- ▶ KMM list 74,427 buyers of French exports in Belgium in 2007
- ▶ A look into the Belgian trade data:
 - ▶ 12,328 unique VAT numbers in Belgian trade data that import from France

Measurement: Identity of foreign buyers

- ▶ KMM list 74,427 buyers of French exports in Belgium in 2007
- ▶ A look into the Belgian trade data:
 - ▶ 12,328 unique VAT numbers in Belgian trade data that import from France
 - ▶ Dropping VAT numbers that do not have any positive employment in Belgium, leaves 10801 VAT numbers.

Measurement: Identity of foreign buyers

- ▶ KMM list 74,427 buyers of French exports in Belgium in 2007
- ▶ A look into the Belgian trade data:
 - ▶ 12,328 unique VAT numbers in Belgian trade data that import from France
 - ▶ Dropping VAT numbers that do not have any positive employment in Belgium, leaves 10801 VAT numbers.
 - ▶ Next, merging the VATs into firms yields 9671 firms with employment in Belgium that import from France.

Measurement: Identity of foreign buyers

- ▶ KMM list 74,427 buyers of French exports in Belgium in 2007
- ▶ A look into the Belgian trade data:
 - ▶ 12,328 unique VAT numbers in Belgian trade data that import from France
 - ▶ Dropping VAT numbers that do not have any positive employment in Belgium, leaves 10801 VAT numbers.
 - ▶ Next, merging the VATs into firms yields 9671 firms with employment in Belgium that import from France.
 - ▶ These multi-VAT firms account for 66.3 % of Belgian imports from France

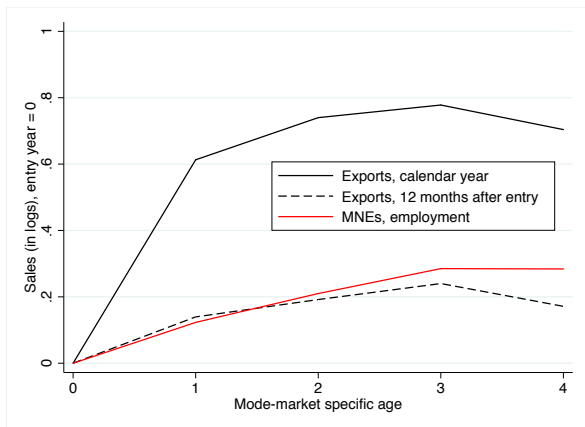
Measurement: Identity of foreign buyers

- ▶ KMM list 74,427 buyers of French exports in Belgium in 2007
- ▶ A look into the Belgian trade data:
 - ▶ 12,328 unique VAT numbers in Belgian trade data that import from France
 - ▶ Dropping VAT numbers that do not have any positive employment in Belgium, leaves 10801 VAT numbers.
 - ▶ Next, merging the VATs into firms yields 9671 firms with employment in Belgium that import from France.
 - ▶ These multi-VAT firms account for 66.3 % of Belgian imports from France
- ▶ What explains these differences? Measurement error?

Measurement: Identity of foreign buyers

- ▶ KMM list 74,427 buyers of French exports in Belgium in 2007
- ▶ A look into the Belgian trade data:
 - ▶ 12,328 unique VAT numbers in Belgian trade data that import from France
 - ▶ Dropping VAT numbers that do not have any positive employment in Belgium, leaves 10801 VAT numbers.
 - ▶ Next, merging the VATs into firms yields 9671 firms with employment in Belgium that import from France.
 - ▶ These multi-VAT firms account for 66.3 % of Belgian imports from France
- ▶ What explains these differences? Measurement error?
- ▶ These measurement errors could plausibly lead to an overstatement of the importance of firm-buyer-specific shocks.

Measurement: Partial-year effects



- ▶ Partial-year effects plausibly lead to an overstatement of the importance of firm-buyer-specific shocks.
- ▶ Remedies:
 - ▶ Calculate 12 months instead of calendar year exports
 - ▶ Drop first year of export sales to every destination

Bigger picture

- ▶ Does trade lead to more or less aggregate volatility?
 - ▶ “Does international trade foster or dampen the risk exposure of firms and countries?”

Bigger picture

- ▶ Does trade lead to more or less aggregate volatility?
 - ▶ “Does international trade foster or dampen the risk exposure of firms and countries?”
- ▶ The paper does not fully answer this question

Bigger picture

- ▶ Does trade lead to more or less aggregate volatility?
 - ▶ “Does international trade foster or dampen the risk exposure of firms and countries?”
- ▶ The paper does not fully answer this question
 - ▶ Need g.e. model to account for the hedging implied by the g.e. price effects after productivity shocks
 - ▶ Requires characterizing what the country would produce in the absence of trade

Bigger picture

- ▶ Does trade lead to more or less aggregate volatility?
 - ▶ “Does international trade foster or dampen the risk exposure of firms and countries?”
- ▶ The paper does not fully answer this question
 - ▶ Need g.e. model to account for the hedging implied by the g.e. price effects after productivity shocks
 - ▶ Requires characterizing what the country would produce in the absence of trade
- ▶ Related to this question, KMM make an important point: We should not ignore micro-shocks since they account for a large share of the aggregate volatility in export sales.

Summary

- ▶ Great paper - I learned a lot from reading it.