Using Firm Level Data

for

Trade Competitiveness Diagnostic

International Trade Department
The World Bank

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ROAD MAP

1. Why firm level data
2. Which data, where to get them
3. How we use the firm level data in the TCD
4. Q&A

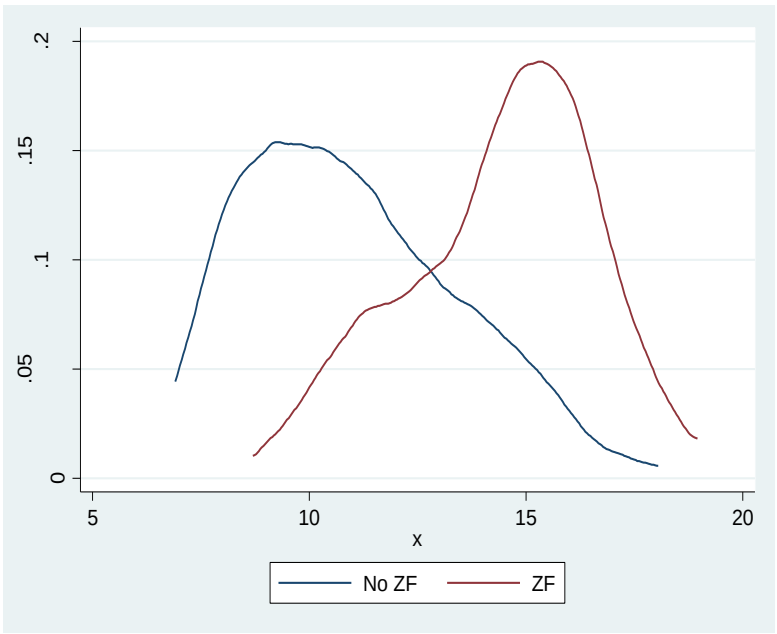
WHY FIRM LEVEL DATA

Why firm level data

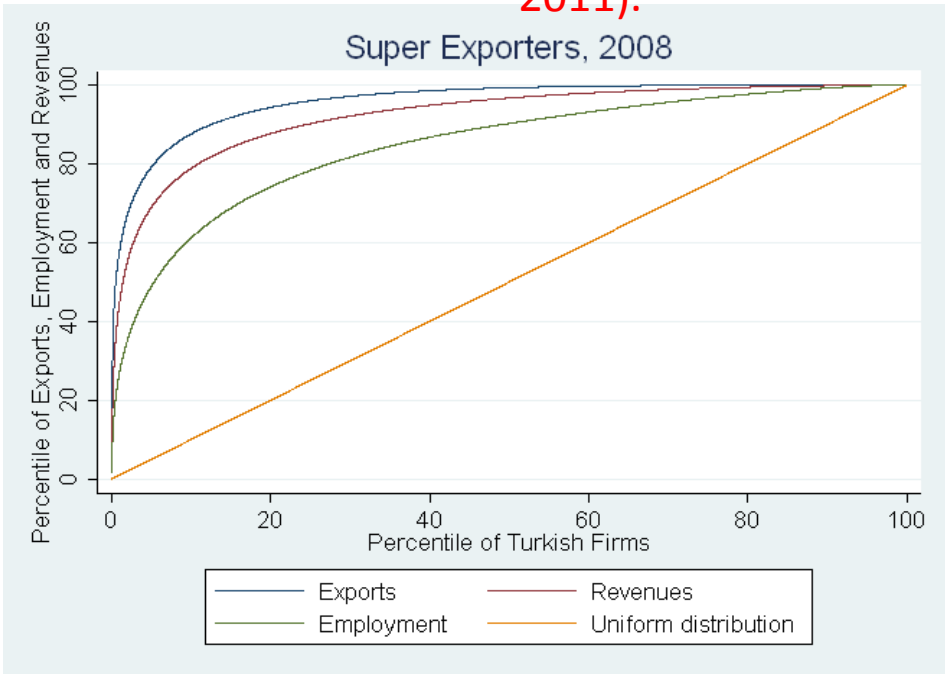
- **Firms react very differently to shocks depending on their specific characteristics**
  - **Aggregate or average performance is not sufficient**
  - **It doesn't give information on how firms are dispersed around the average**
  - **It doesn't allow to measure how shocks affect this dispersion**

"Contrary to common belief, in fact, there is no average firm" (Altomonte et all, 2011).

- **Knowing the distribution is important:**



Any measure of performance or size: exports, productivity, etc



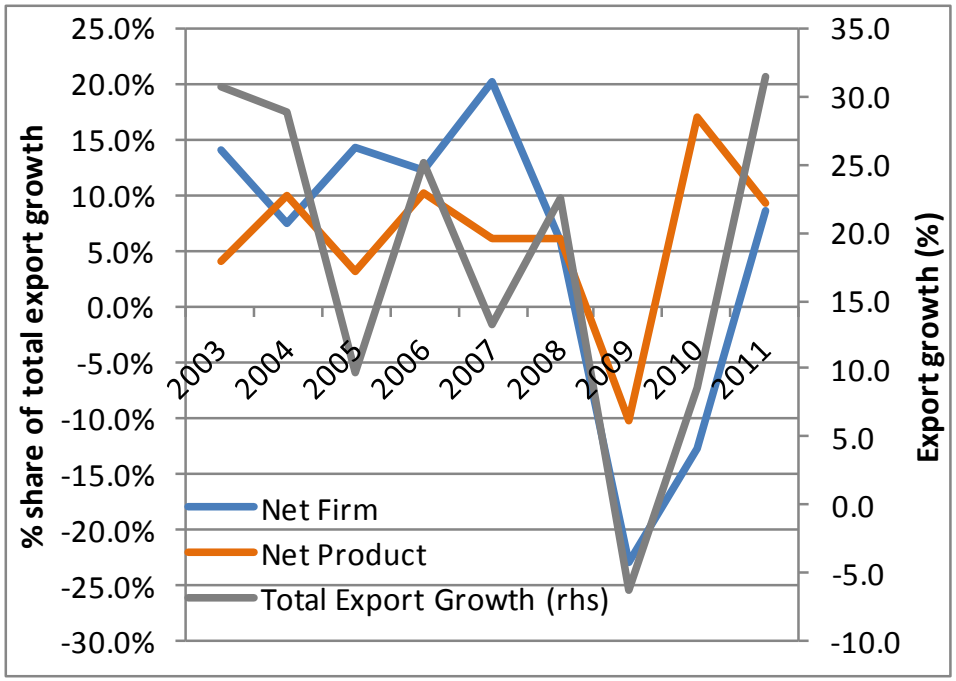
Why firm level data

- Export outcomes depend on a range of firm decisions
  - Exporting/Not Exporting?
  - Which export markets?
  - What product portfolio?
  - Compete on volumes, quality or price terms?
- We call these the margins of export
- Appropriate policy advice needs to understand how these decisions translate in aggregate exports
- Example:
  - Suppose you need to advise the government on how to increase their exports.
  - Aggregate data tell you that they did very well in the past 10 years.
    - Export coverage and market penetration is high.
    - The range of products exported increased a lot.
    - The average quality of the goods exported also improved.
  - What would your advice be if you learn that it is really few large firms, mostly located in KL, that are responsible for this good performance?
  - What would your advice be if you learn that there are many small firms each serving one or two destinations with one or two products and that these firms only manage to survive as exporters for very few years?

Why firm level data

- Understanding the margins of exports matters for aggregate outcomes!

Correlation of overall export growth with the margins of export (2003-2011).

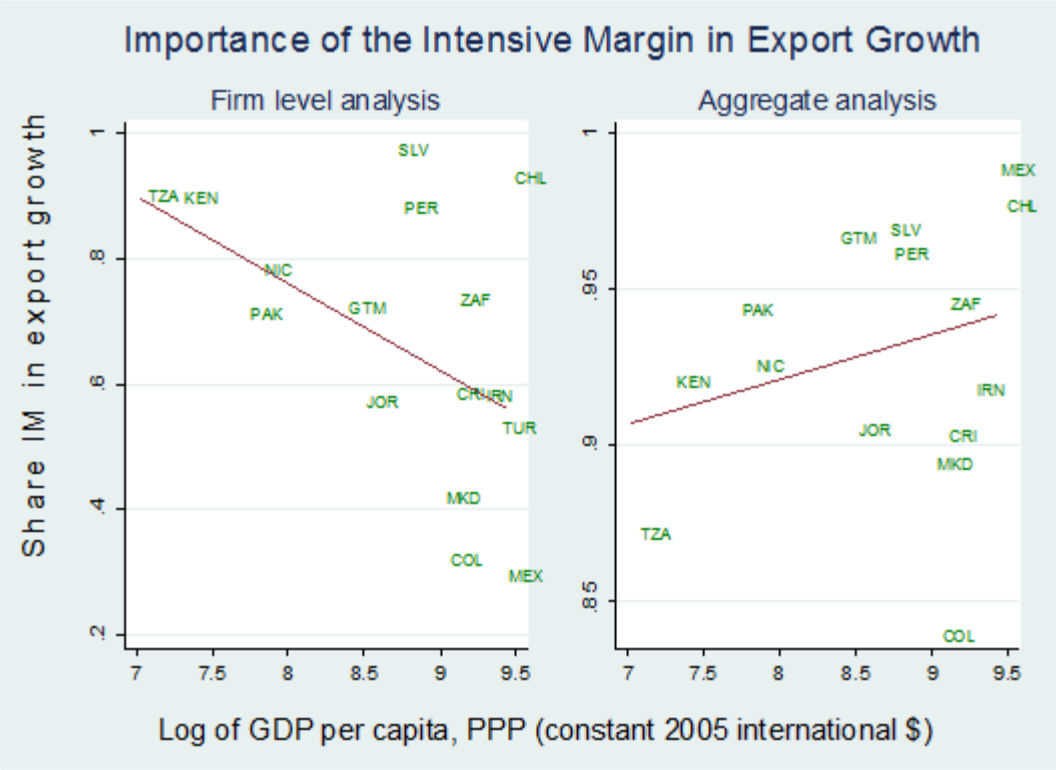


Export growth correlation with:	
Share of growth from firm extensive margin	65.8%
Share of growth from market extensive margin	-6.6%
Share of growth from product extensive margin	54.5%
Share of growth from intensive margin	-65.5%

Source: Trade CEM Turkey

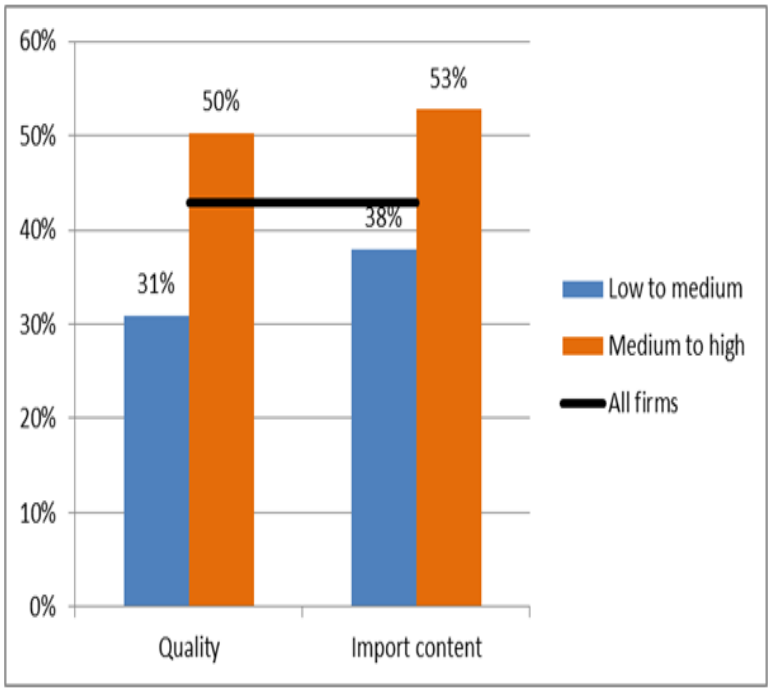
Why firm level data

- And carrying out the same computations in the aggregate and at the firm level can deliver completely different messages



Why firm level data

- Identifying the policy treatment requires not only a good diagnosis but also good "aetiology"
  - Linking outcomes to structural, micro and macroeconomic factors
- Example: 5-year export survival for firms of different export quality and import content



Why firm level data

- Linking outcomes with determinants often is not possible with aggregate data
  - Assessing the average reaction to a shock and administering the policy cure on that basis may kill many patients! Recall firms differs from each other
  - Aggregate quantitative assessments often suffer of severe problems of endogeneity and reverse causality
  - Most of the necessary information is not available at the aggregate level: e.g. TFP, R&D, investment, etc.

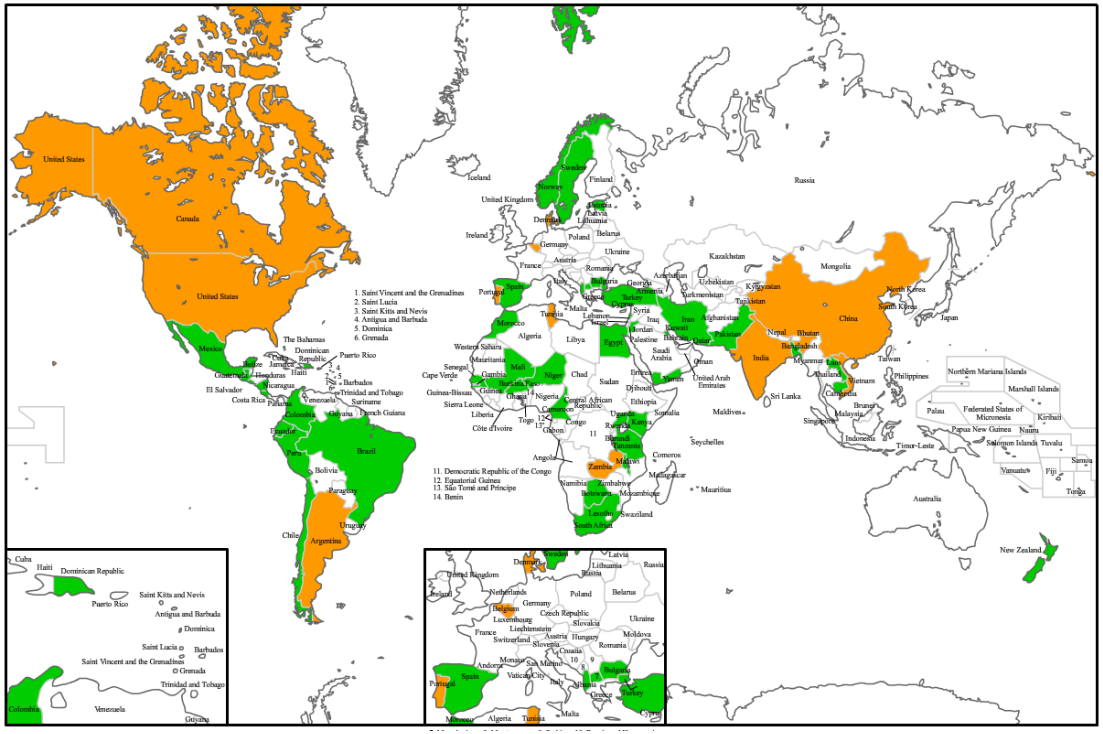
WHICH DATA, WHERE TO GET THEM

Which data, where to get them?

- **Customs data**:
  - Customs data on **all** goods imports and exports at the transaction level.
  - Information available:
    - Date of the export/import transaction (this variable could be expressed daily, monthly or yearly depending on its availability)
    - Exporter or Importer's ID (this variable can contain either the name of the exporter or any other exporter ID – or both if possible),
    - Customs office/border utilized by the exporter/importer
    - Product exported / imported (according to the HS classification at the highest level of disaggregation available),
    - Destination / Origin,
    - Value of merchandise exported / imported (in national currency), and
    - Quantities exported / imported by transaction (this could be expressed in net weight or in units)
  - Customs data on goods: normally collected/maintained by the National Statistical Agency or by the Customs Administration directly.
  - Customs data on services: normally collected/maintained by the Central Bank.

Which data, where to get them?

- **Customs data**:
  - WB-DEC Exporter Dynamics Database (forthcoming): customs data for exports in goods for 44 countries to date, for a range of years between 1998 and 2010.



Data currently available

Forthcoming data/under negotiation

Which data, where to get them?

- **Data on other firm-level information**:
  - Normally available through business registries, surveys undertaken and maintained by the National Statistical Agency
  - Data requirement vary according to the question one wants to study, but most commonly the following:
    - Unique firm identifier (same used for customs data)
    - Year
    - Turnover (value of sales)
    - Number of employees
    - Value Added of production
    - Wage costs
    - Material costs
    - Stock of capital
    - Total Assets (at beginning of year and at end of year)
    - Fixed Assets (at beginning of year and at end of year)
    - Total investment
    - Investment in R&D
  - Where plant data exist (e.g. Colombia), one can also look at the domestic economic geography of exporters

Confidentiality issues

- Initial reaction to firm level data requests is often: no!

- Many countries do not have experience in making these data available for analysis and research purposes. However once they recognize the usefulness of using these data, they engage actively in getting them (examples: Macedonia, Nicaragua).

- The WB has experience with dealing with the confidential nature of firm level data and the legal requirements in place for protecting that confidentiality (Exporter Dynamics Database).
  - For example, the World Bank's legal department has developed internal procedures that are designed to ensure that researchers maintain data integrity and confidentiality.

What to do when firm level data are not available?

- The TCD Framework is still able to give a very rich overview of the outlook in a country.
- Enterprise survey, field interviews, focus groups and qualitative analysis also help in connecting outcomes to determinants.
- Cross-country knowledge of how firm level dynamics is connected to more aggregate outcomes is also of guidance.

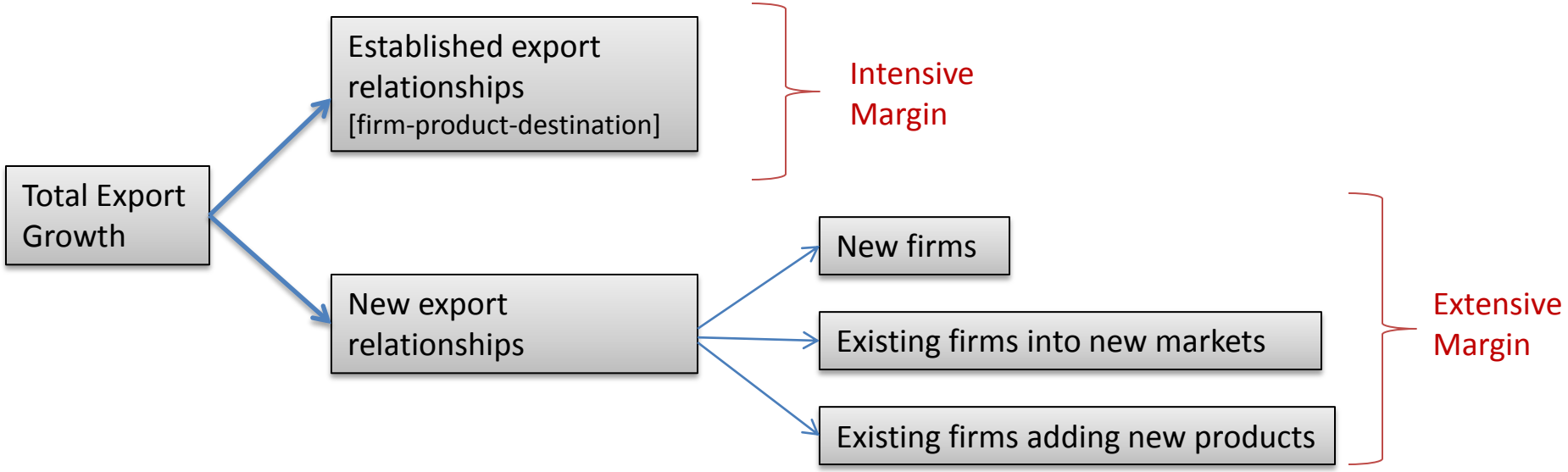
HOW DO WE USE FIRM LEVEL DATA IN THE TCD

Integrating the firm level analysis in the TCD framework

- Export growth decomposition.
- Using firm level data to assess market and product expansion and diversification.
- Compositional issues: churning, importance of old vs. new exporters, dynamism of the export sector, existence of a “mittlestand”.
- Aetiology: Relating outcomes to determinants
  - Importance of firm-specific determinants vs. institutional or trade policy determinants
  - Assessing importance of sensitive issues: imported inputs, exchange rate, etc.
  - Quantify linkages between e.g. diversification, value addition, quality and export growth

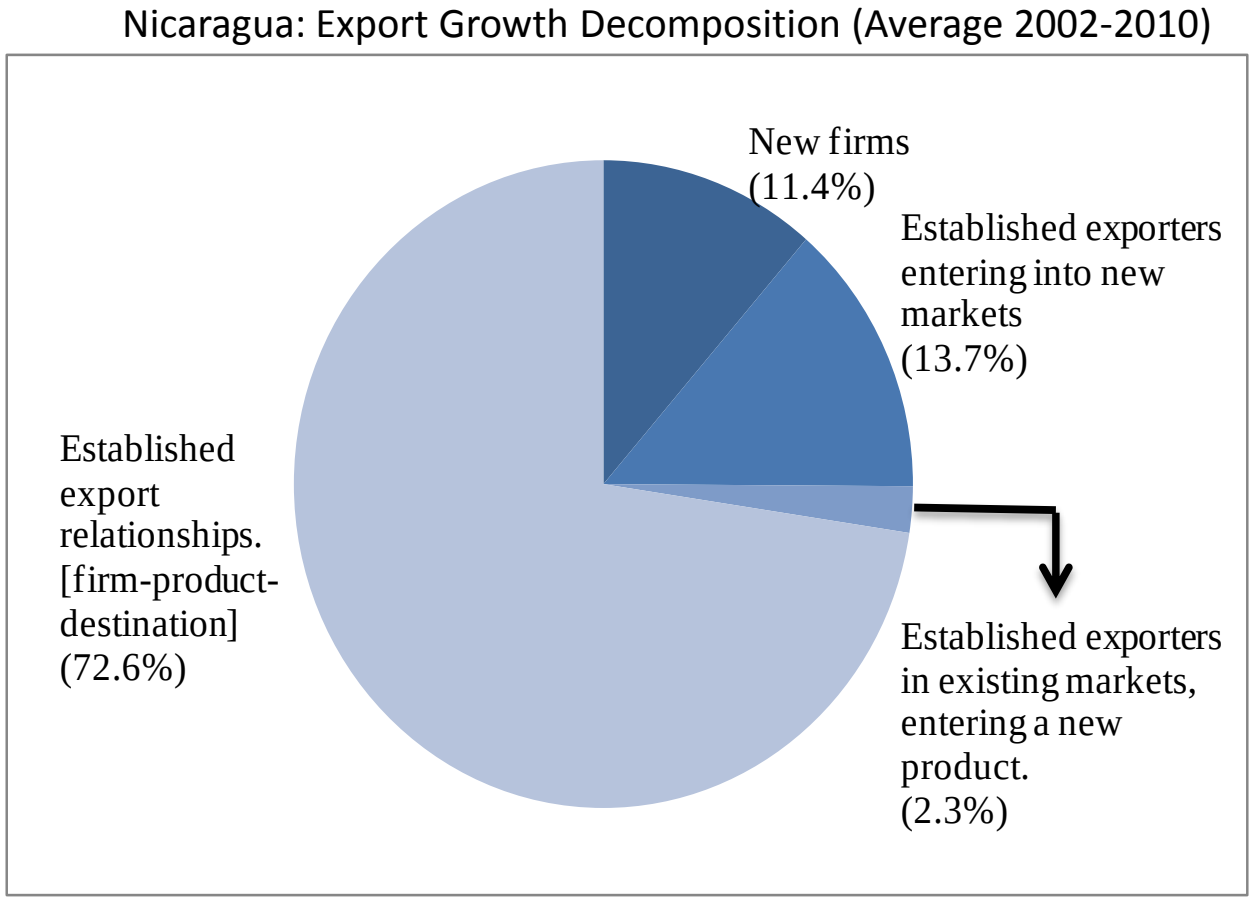
Export growth decomposition

- It is crucial to know from where the observed aggregate dynamism (or lack) of exports is coming from.
  - Exporters exploiting established trade relationships?
  - Exporters expanding into new markets, products, or both?
  - Brand new exporting firms?
- To respond these question we need a framework:



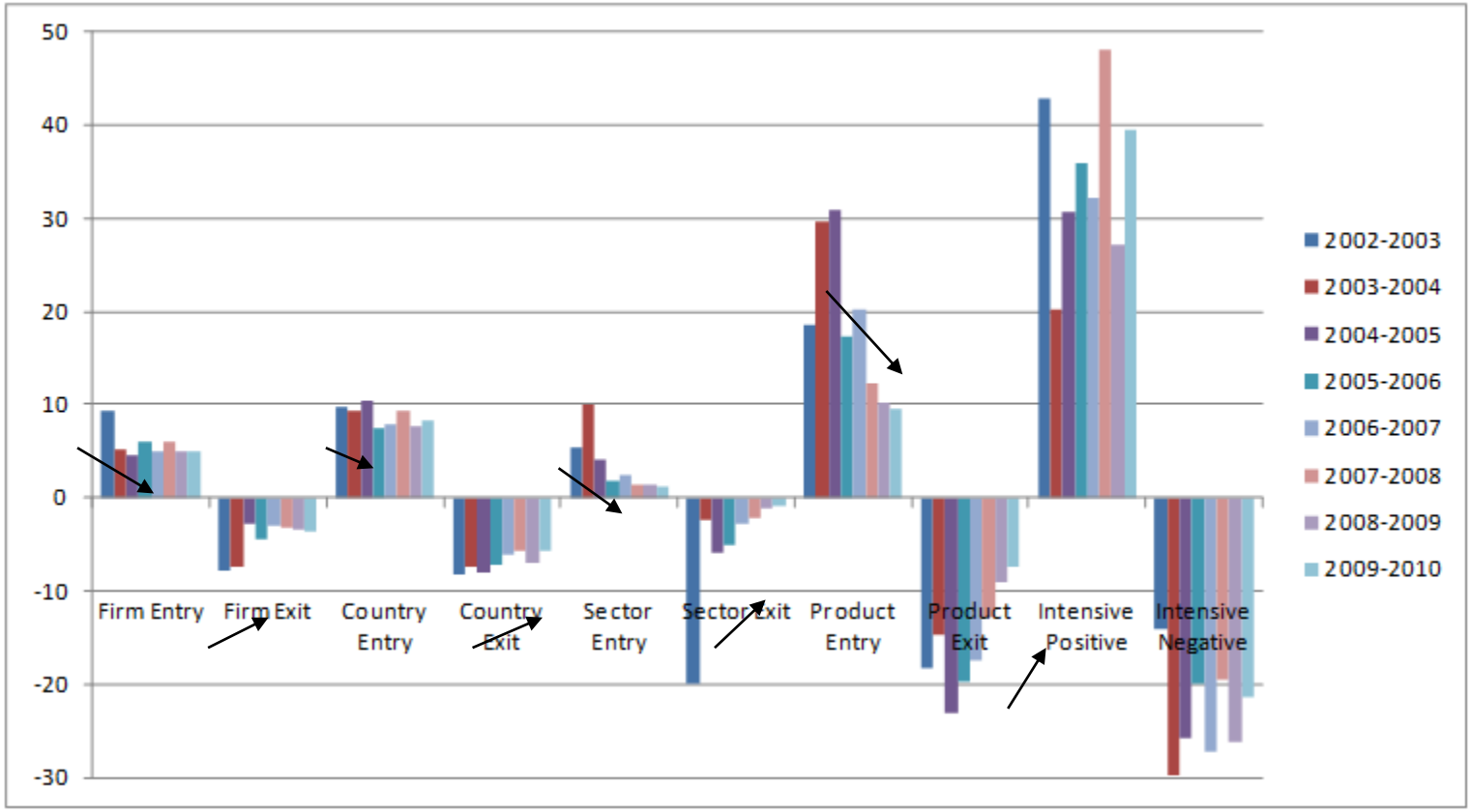
Export growth decomposition

- Nicaragua: Dominance of the intensive margin



Export growth decomposition

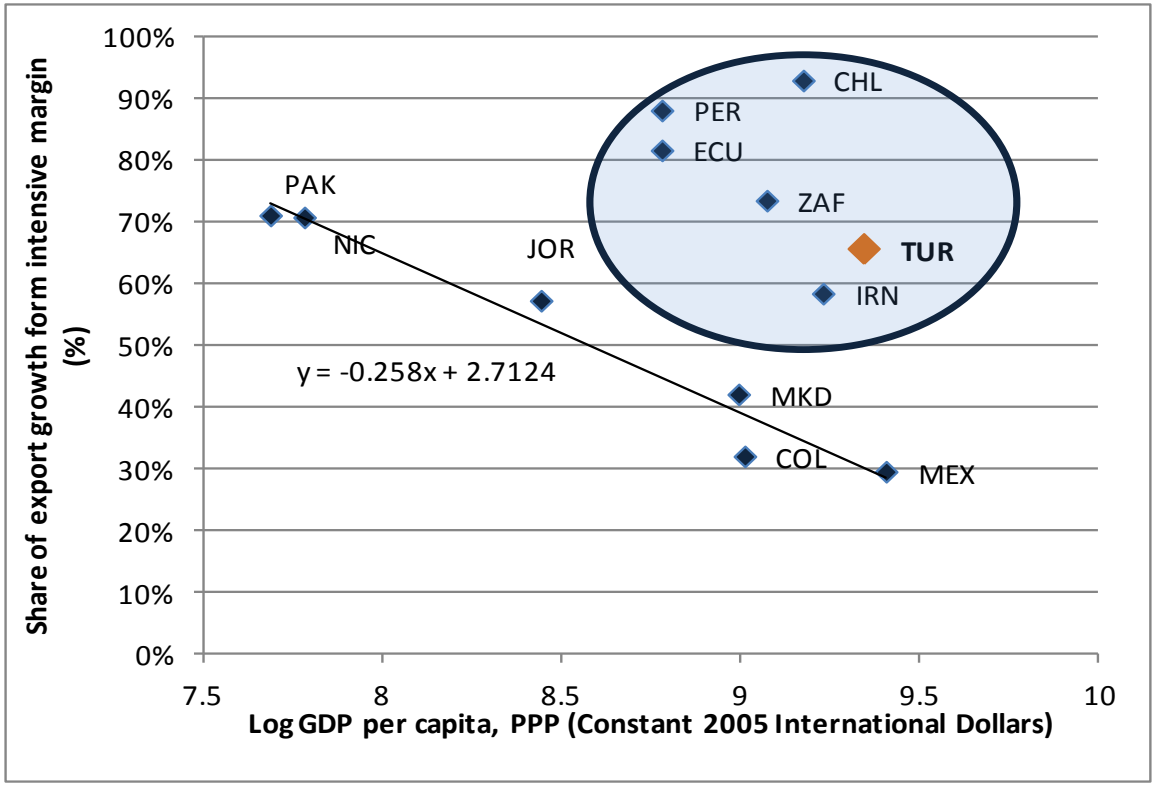
- Pakistan: decreasing dynamism along the extensive margin



Export growth decomposition

- Turkey: cross-country comparisons suggest underperfomance of extensive margin

Participation of the Intensive Margin at Different Levels of Development

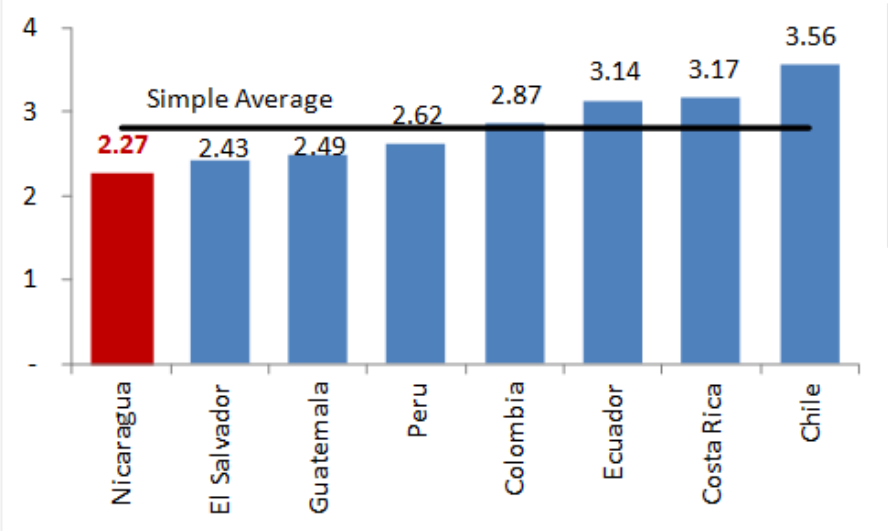


Using firm level data to assess market and product expansion and diversification

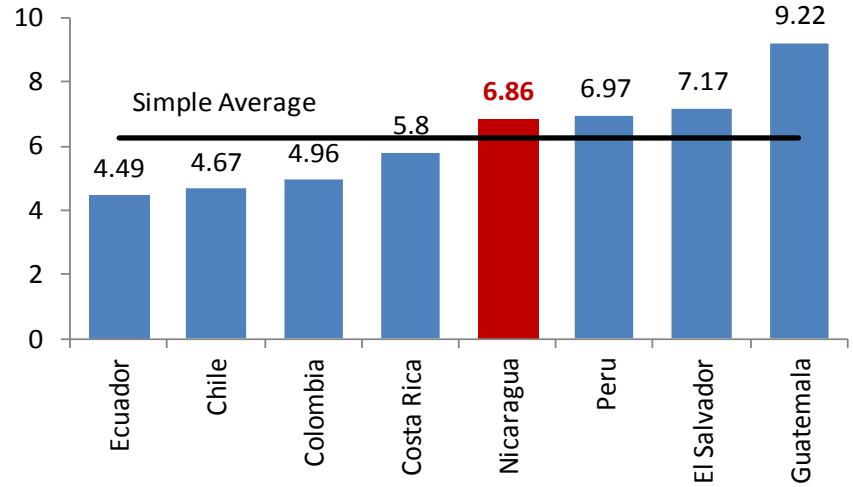
- It helps understanding if market and product diversification observed through bilateral, product specific trade data corresponds to:
  - Strategies pursued by a broad set of firms
  - Few firms, that dominate
- It helps understanding patterns of expansion and change
  - Is it existing exporters that switch sectors and products or structural changes are the result of new exporters replacing old exporters?
  - What is the pattern of market/product expansion and retrenchment?
  - Is there an optimal number of markets and/or products that the firm exports?
  - How do firms react in terms of market and product diversification when there is an exogenous shock or policy change?

Using firm level data to assess market and product expansion and diversification

Number of Markets Reached by the Average Exporter (2009)

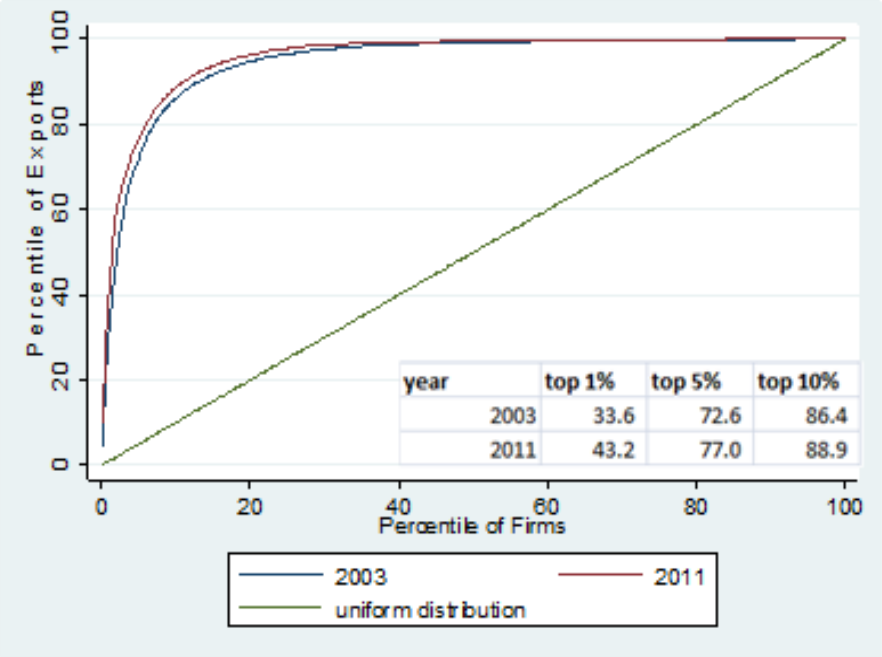


Number of Products exported by the Average Exporter (2009)



Compositional Issues: 1. Concentration

- Exports are highly concentrated around few exporters…

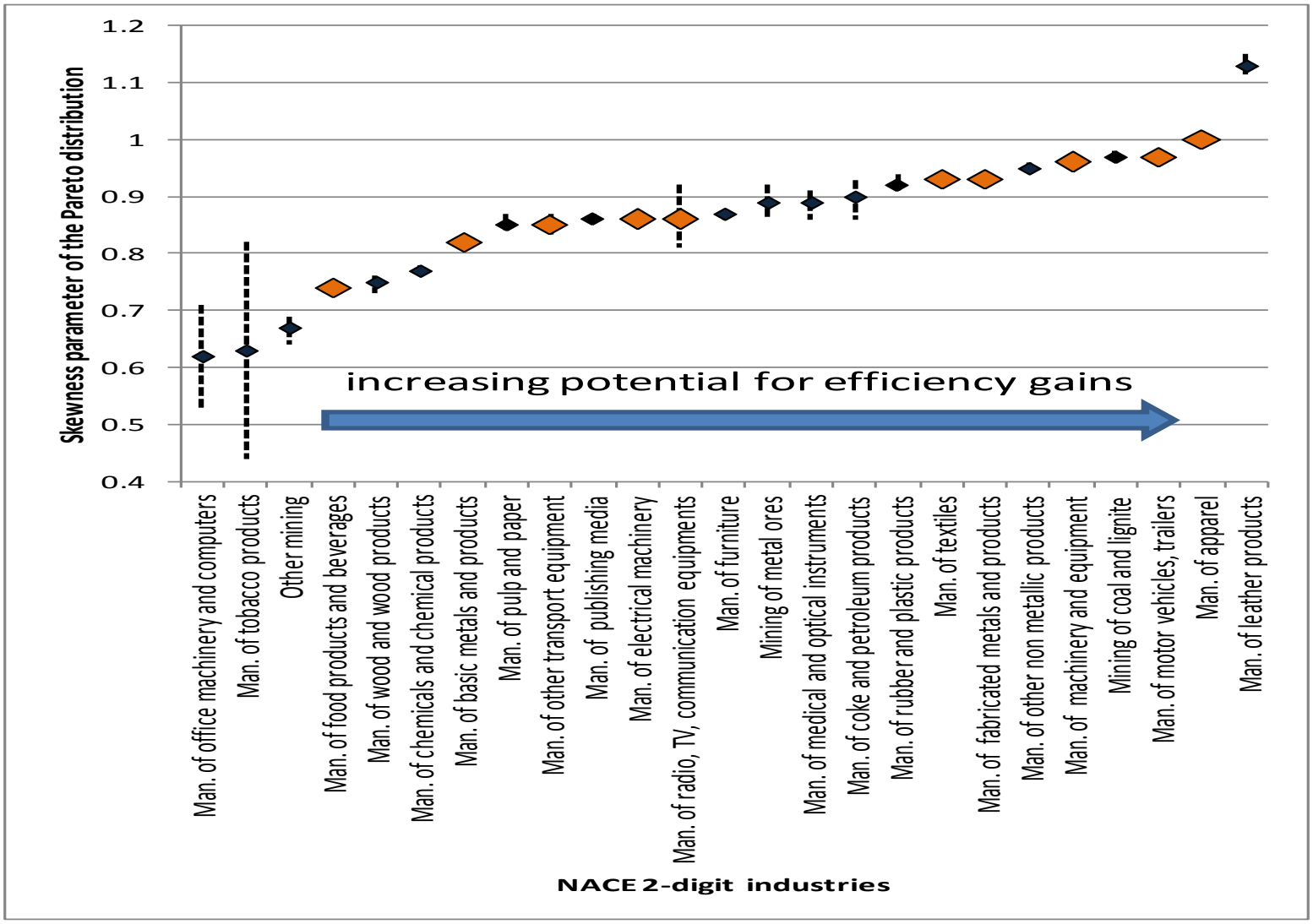


country	top 1%	top 5%	top 10%
Nicaragua (2011)	43.2	77.0	88.9
El Salvador (2009)	47.9	80.9	91.5
Guatemala (2010)	48.5	80.2	90.5
Costa Rica (2007)	56.7	82.2	91.2
Colombia (2009)	67.6	87.6	93.4
Ecuador (2009)	67.4	88.2	94.7
Mexico (2009)	69.6	90.7	96.1
Chile (2009)	75.4	91.4	95.7
Peru (2009)	77.6	91.4	95.3

… but not as much as in other peer countries.

Finding: Compared to peer countries, Nicaragua has few exporters that are very large. Many small and medium exporters. Is it a problem?

Compositional Issues: 2. Measuring the potential for efficiency gains



Compositional Issues: 3. Entry, exit, survival patterns: dynamism VS resilience

Nicaragua: Export Survival of New Exporters (2003-2011)

Entry Year -->	2003	2004	2005	2006	2007	2008	2009	2010	2011
2003	405								
2004	42.0%	325							
2005	32.8%	47.1%	383						
2006	28.9%	40.0%	55.9%	302					
2007	24.2%	30.5%	43.3%	47.7%	333				
2008	20.0%	27.1%	37.3%	35.1%	49.5%	339			
2009	21.0%	21.2%	31.6%	29.5%	32.7%	50.7%	317		
2010	19.3%	20.6%	26.6%	24.2%	27.0%	38.9%	46.4%	241	
2011	17.0%	17.2%	23.5%	24.5%	26.1%	28.6%	38.8%	45.2%	200

Aetiology: Relating outcomes to determinants

A baseline econometric framework for OLS regressions (Turkey)

Firm level determinants

Macro factors

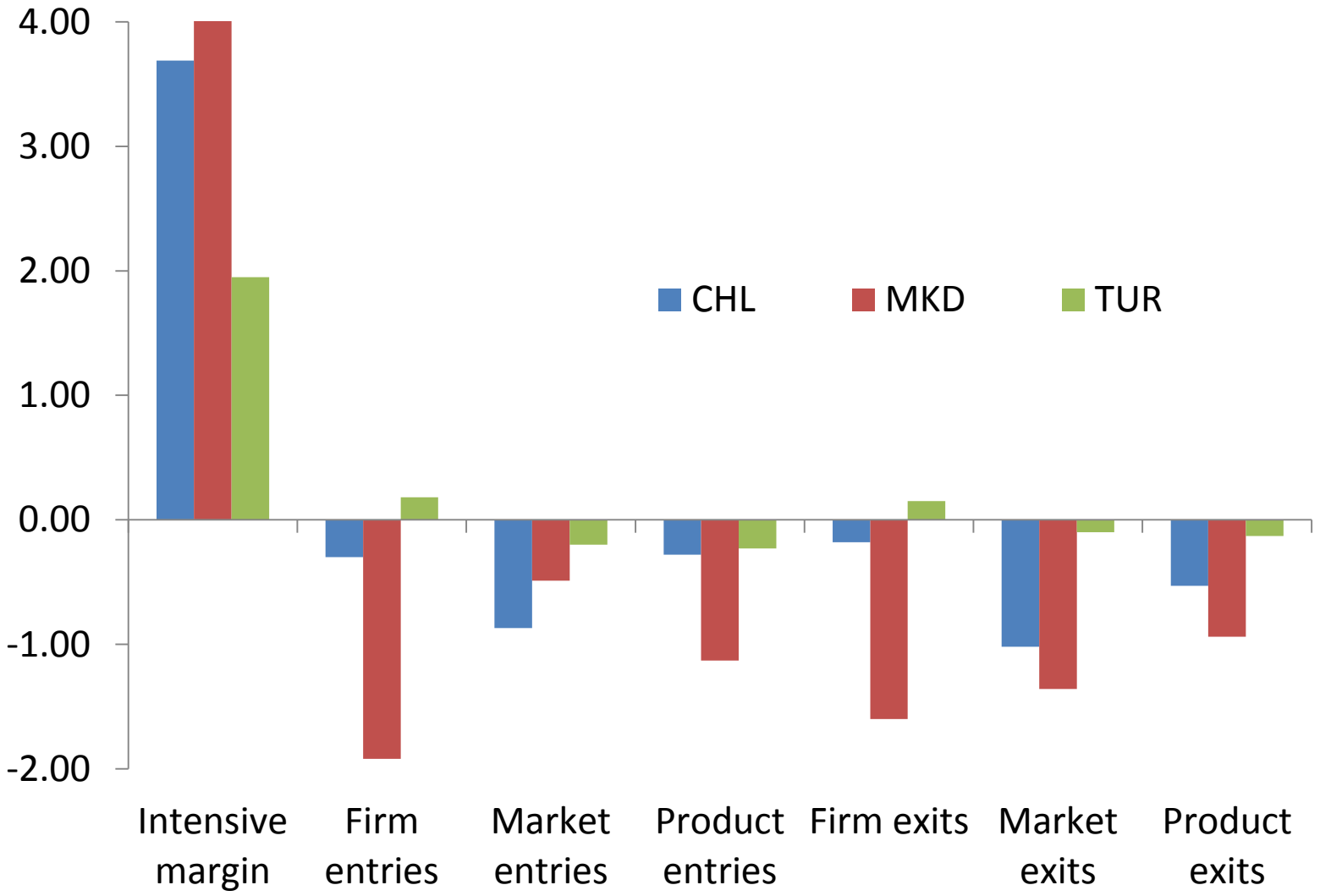
Trade policy determinants

FACTORS	VARIABLES	gr_try
PRODUCTIVITY:	**dln(TFP)**	**0.12***** (0.008)
SIZE:	**ln(revenue)**	**0.05***** (0.003)
UNIT VALUE OF EXPORTS:	**ln(xruvi)**	**0.04***** (0.010)
HIGH IMPORT CONTENT OF PRODUCTION:	**ln(imports/turnover)**	**0.00** (0.002)
UNIT VALUE OF IMPORTS:	**ln(mruvi)**	**-0.02***** (0.003)
SPECIALIZATION IN EXPORTS OF INTERMEDIATES :	**ln(exports_intermediates/exports)**	**-0.07***** (0.03)
FOREIGN DEMAND:	**dln(netimport)**	**0.07***** (0.014)
BILATERAL EXCHANGE RATE:	**dln(RER)**	**-0.16*** (0.1)
PREFERENTIAL TRADE AGREEMENTS:	**PTA**	**0.001** (0.030)
BARRIERS TO EXPORT:	**dln(time_trade)**	**-6.24***** (1.70)
	Observations	780034
	R-squared	0.015

Market diversification determinants at firm level

Regressor	spec 1	spec 2	spec 3	spec 4
# of Enterprises	**0.244*** **	**0.177*** **	**0.177*** **	**0.181*** **
# of Markets		-0.520***	-0.516***	-0.405***
# of Products			0.013	-0.008
Size of firms				0.038***
HS2 F.E.	Yes	Yes	Yes	Yes
Destination F.E.	Yes	Yes	Yes	Yes
Year F.E.	Yes	Yes	Yes	Yes
Observations	5840	5840	5840	5840

Example: Effect on Entries and Exits of a 10% Devaluation of the Exchange Rate



Questions & Answers

THANK YOU

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