Trade, Misallocation, and Capital Market Integration

Laszlo Tetenyi

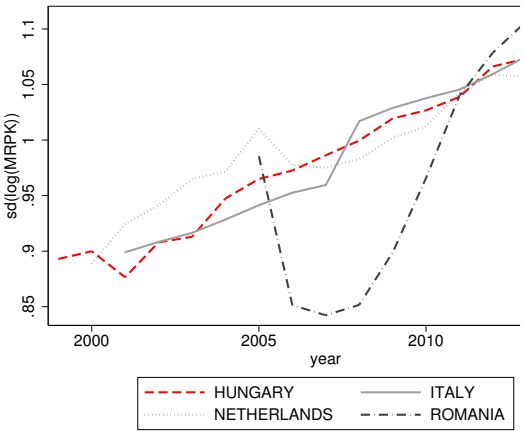
October 9, 2019

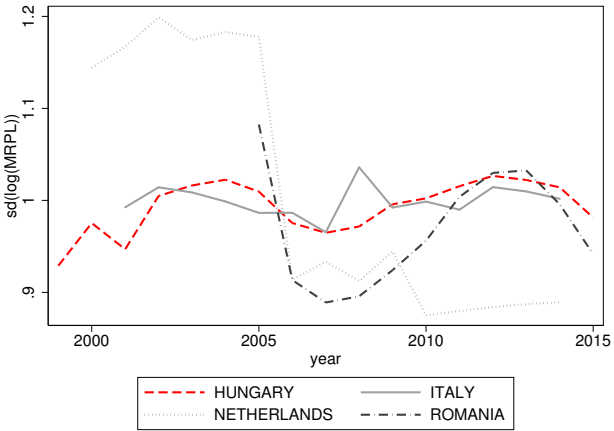
New York University

Integration into the world economy

- Countries with underdeveloped capital markets open up their markets
- Goods market — Reduce trade barriers
- Capital market — Dispose of capital controls
- Conventional wisdom:
  - Trade liberalization improves productivity/output/welfare
  - Ambiguous effect of capital market integration
- Only focus on the empirics in this presentation
- Preliminary results — all feedback is welcome

Dispersion of returns to capital and labor in the EU





How do capital markets affect the gains from trade?

Goal: understand correlations

Level	Country	Sector	Firm
Data	World 1950-2014	EU 2000-2014	Hungary 2005-2017
Source	IMF + WB + PWT	CompNet + WIOD	Administrative
Productivity	TFP	TFPR	TFPR
Resource allocation	-	s.d. (MRPK) & zombie	s.d. (ARPK) & entry/ exit
Trade liberalization	$\frac{\text{Import}}{\text{GDP}}$	$\frac{\text{Export revenue}}{\text{Total revenue}}$	Export revenue
Financial development	$\frac{\text{Domestic Credit}}{\text{GDP}}$	$\frac{\text{Trade Credit}}{\text{Asset}}$	$\frac{\text{Asset}}{\text{Equity}}$
Capital Market Integration	Chinn-Ito (2006) index	-	-

How do capital markets affect the gains from trade?

Level of data aggregation determining the question that can be asked

Level	Country	Sector	Firm
Data	World 1950-2014	EU 2000-2014	Hungary 2005-2017
Source	IMF + WB + PWT	CompNet + WIOD	Administrative
Productivity	TFP	TFPR	TFPR
Resource allocation	-	s.d. (MRPK) & zombie	s.d. (ARPK) & entry/ exit
Trade liberalization	$\frac{\text{Import}}{\text{GDP}}$	$\frac{\text{Export revenue}}{\text{Total revenue}}$	Export revenue
Financial development	$\frac{\text{Domestic Credit}}{\text{GDP}}$	$\frac{\text{Trade Credit}}{\text{Asset}}$	$\frac{\text{Asset}}{\text{Equity}}$
Capital Market Integration	Chinn-Ito (2006) index	-	-

How do capital markets affect the gains from trade?

Financial market development and integration affects productivity?

Level	Country	Sector	Firm
Data	World 1950-2014	EU 2000-2014	Hungary 2005-2017
Source	IMF + WB + PWT	CompNet + WIOD	Administrative
Productivity	TFP	TFPR	TFPR
Resource allocation	-	s.d. (MRPK) & zombie	s.d. (ARPK) & entry/ exit
Trade liberalization	$\frac{\text{Import}}{\text{GDP}}$	$\frac{\text{Export revenue}}{\text{Total revenue}}$	Export revenue
Financial development	$\frac{\text{Domestic Credit}}{\text{GDP}}$	$\frac{\text{Trade Credit}}{\text{Asset}}$	$\frac{\text{Asset}}{\text{Equity}}$
Capital Market Integration	Chinn-Ito (2006) index	-	-

How do capital markets affect the gains from trade?

Higher export share leads to lower capital misallocation?

Level	Country	Sector	Firm
Data	World 1950-2014	EU 2000-2014	Hungary 2005-2017
Source	IMF + WB + PWT	CompNet + WIOD	Administrative
Productivity	TFP	TFPR	TFPR
Resource allocation	-	s.d. (MRPK) & zombie	s.d. (ARPK) & entry/ exit
Trade liberalization	$\frac{\text{Import}}{\text{GDP}}$	$\frac{\text{Export revenue}}{\text{Total revenue}}$	Export revenue
Financial development	$\frac{\text{Domestic Credit}}{\text{GDP}}$	$\frac{\text{Trade Credit}}{\text{Asset}}$	$\frac{\text{Asset}}{\text{Equity}}$
Capital Market Integration	Chinn-Ito (2006) index	-	-

How do capital markets affect the gains from trade?

Is external finance important for exporting?

Level	Country	Sector	Firm
Data	World 1950-2014	EU 2000-2014	Hungary 2005-2017
Source	IMF + WB + PWT	CompNet + WIOD	Administrative
Productivity	TFP	TFPR	TFPR
Resource allocation	-	s.d. (MRPK) & zombie	s.d. (ARPK) & entry/ exit
Trade liberalization	$\frac{\text{Import}}{\text{GDP}}$	$\frac{\text{Export revenue}}{\text{Total revenue}}$	Export revenue
Financial development	$\frac{\text{Domestic Credit}}{\text{GDP}}$	$\frac{\text{Trade Credit}}{\text{Asset}}$	$\frac{\text{Asset}}{\text{Equity}}$
Capital Market Integration	Chinn-Ito (2006) index	-	-

How do capital markets affect the gains from trade?

Some consistency checks across datasets

Level	Country	Sector	Firm
Data	World 1950-2014	EU 2000-2014	Hungary 2005-2017
Source	IMF + WB + PWT	CompNet + WIOD	Administrative
Productivity	TFP	TFPR	TFPR
Resource allocation	-	s.d. (MRPK) & zombie	s.d. (ARPK) & entry/ exit
Trade liberalization	$\frac{\text{Import}}{\text{GDP}}$	$\frac{\text{Export revenue}}{\text{Total revenue}}$	Export revenue
Financial development	$\frac{\text{Domestic Credit}}{\text{GDP}}$	$\frac{\text{Trade Credit}}{\text{Asset}}$	$\frac{\text{Asset}}{\text{Equity}}$
Capital Market Integration	Chinn-Ito (2006) index	-	-

TFP is positively correlated with trade

	$\log(\frac{Import}{GDP})$	$\log(\frac{Credit}{GDP})$	$\log(\frac{Import}{GDP}) \times \log(\frac{Credit}{GDP})$	CMI	$\log(\frac{Import}{GDP}) \times CMI$
Log(TFP)	0.184***	0.185***	0.1061***	-0.0343	-0.0889***
s.e.	(0.0183)	(0.0107)	(0.008)	(0.0216)	(0.0168)

Standard errors in parentheses. N = 3983, Country and time FE

corr(TFP,trade) is stronger with financial development

	$\log(\frac{Import}{GDP})$	$\log(\frac{Credit}{GDP})$	$\log(\frac{Import}{GDP}) \times \log(\frac{Credit}{GDP})$	CMI	$\log(\frac{Import}{GDP}) \times CMI$
Log(TFP)	0.184***	0.185***	0.1061***	-0.0343	-0.0889***
s.e.	(0.0183)	(0.0107)	(0.008)	(0.0216)	(0.0168)

Standard errors in parentheses. N = 3983, Country and time FE

corr(TFP,trade) is not/negatively affected if capital markets are integrated

	$\log(\frac{Import}{GDP})$	$\log(\frac{Credit}{GDP})$	$\log(\frac{Import}{GDP}) \times \log(\frac{Credit}{GDP})$	CMI	$\log(\frac{Import}{GDP}) \times CMI$
Log(TFP)	0.184***	0.185***	0.1061***	-0.0343	-0.0889***
s.e.	(0.0183)	(0.0107)	(0.008)	(0.0216)	(0.0168)

Standard errors in parentheses. N = 3983, Country and time FE

Implied TFP change in pp. in 1992 to 10 $\%$ import liberalization

Country	$\frac{\text{Credit}}{\text{GDP}}$	$\Delta TFP_{\emptyset CMI}$	ΔTFP_{CMI}
Germany	88.7	4.9	2.6
Italy	58.15	3.6	2.3
Hungary	32.2	1.8	1.8

Table 1: The effect of an increase of the import share from 30% to 40%

Misallocation and trade exposure

	$\sigma(ARPK)$	$\sigma(ARPL)$	% Zombie firms	Avg. t. Zombie	% firms constrained
$\frac{\text{Export}}{\text{Output}}$	0.0513*	0.0276	0.0377***	0.419***	0.0282*
	(0.0212)	(0.0202)	(0.00910)	(0.109)	(0.0111)
$\frac{\text{Trade credit}}{\text{Assets}}$	0.202**	0.0439	-0.0649*	-0.479	0.0307
	(0.0754)	(0.0515)	(0.0281)	(0.298)	(0.0448)
$\frac{\text{Trade credit}}{\text{Assets}} \times \frac{\text{Export}}{\text{Output}}$	-0.245*	-0.104	-0.194***	-1.830***	-0.284***
	(0.117)	(0.0934)	(0.0484)	(0.515)	(0.0540)
N	6115	6115	3667	2236	4132
Time & Country FE	✓	✓	✓	✓	✓

Exporting probability is persistent

	$\mathbf{1}(X_{i,t-1} > 0)$	λ	$\log \frac{\text{Asset}}{\text{Equity}}$	Controls	Firm FE	N
$\mathbf{1}(X_{i,t} > 0)$	0.460***	-	0.000747***	Rev, K, ARPK	✓	1713052
s.e.	(0.00196)	-	(0.000162)	-	-	
ΔX	-	55.77***	0.074***	ARPK	✓	64257
s.e.	-	(4.965)	(0.0102921)	-	-	-

Exporting probability correlated with access to external finance

	$\mathbf{1}(X_{i,t-1} > 0)$	λ	$\log \frac{\text{Asset}}{\text{Equity}}$	Controls	Firm FE	N
$\mathbf{1}(X_{i,t} > 0)$	0.460***	-	0.000747***	Rev, K, ARPK	✓	1713052
s.e.	(0.00196)	-	(0.000162)	-	-	
ΔX	-	55.77***	0.074***	ARPK	✓	64257
s.e.	-	(4.965)	(0.0102921)	-	-	-

Unobserved and truncated exports - Heckman Selection

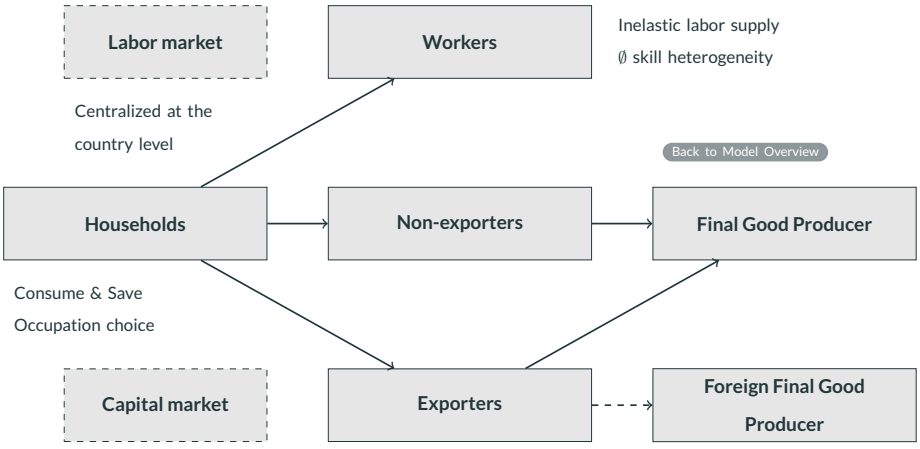
$\lambda =$ Inverse Mills Ratio

	$\mathbf{1}(X_{i,t-1} > 0)$	λ	$\log \frac{\text{Asset}}{\text{Equity}}$	Controls	Firm FE	N
$\mathbf{1}(X_{i,t} > 0)$	0.460***	-	0.000747***	Rev, K, ARPK	✓	1713052
s.e.	(0.00196)	-	(0.000162)	-	-	
ΔX	-	55.77***	0.074***	ARPK	✓	64257
s.e.	-	(4.965)	(0.0102921)	-	-	-

Export growth correlated with access to external finance

	$\mathbf{1}(X_{i,t-1} > 0)$	λ	$\log \frac{\text{Asset}}{\text{Equity}}$	Controls	Firm FE	N
$\mathbf{1}(X_{i,t} > 0)$	0.460***	-	0.000747***	Rev, K, ARPK	✓	1713052
s.e.	(0.00196)	-	(0.000162)	-	-	
ΔX	-	55.77***	0.074***	ARPK	✓	64257
s.e.	-	(4.965)	(0.0102921)	-	-	-

Model of heterogeneous firms



Findings

- Financial frictions & lower trade barriers can explain increase in misallocation
- Aggregate impact is magnified if there is a capital inflow to the country:
  - Productivity declines despite the increased trade — inequality increases further
  - But both output, consumption and welfare increases even more
- It is driven by the increased survival of unproductive firms
- The increase in misallocation takes time after trade liberalization