

Harmful Pro-Competitive Effects of Trade in Presence of Credit Market Frictions

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St. Gallen / Lucerne

January 2018

Economics Seminar, Oxford University

Introduction (I)

Background:

- ▶ The recent literature emphasizes positive pro-competitive forces of international trade on productivity and output
- ▶ Stiffer competition is predicted to boost productivity by:
 - reallocating production factors from less to more productive firms (Melitz, 2003; Melitz and Ottaviano, 2008)
 - improving firm productivity: Companies trim their fat (e.g., Pavcnik, 2002) or focus on their core products (Bernard et al., 2011)

This paper:

- ▶ We explore the effects of stiffer foreign competition on productivity and output in an economy characterized by:
 - significant credit-market frictions (CMF)
 - asset inequality

i.e., under circumstances we encounter throughout the developing world (Banerjee and Duflo, 2010)

Introduction (II)

This paper (continued):

- ▶ We are interested in whether, and through which channels, stiffer competition affects factor misallocation (due to CMF) . . .
- ▶ . . . and identify and describe two harmful pro-competitive effects of international trade on productivity and output
- ▶ We further provide evidence (from 7 Latin American countries) in support of the key mechanism discussed in the paper

Theoretical set-up:

- ▶ We consider a monopolistically competitive economy with an endogenous distribution of mark-ups due to CMF and wealth inequality
- ▶ Loan repayment is imperfectly enforceable so that borrowing depends on wealth – which implies that poorer entrepreneurs:
 - run smaller firms
 - charge higher mark-ups

Preview of theoretical results:

- ▶ Exposure to international trade narrows down the mark-ups charged by smaller firms since:
 - import competition reduces the maximum prices that can be charged
 - borrowing costs increase (as bigger firms increase factor demand)
- ▶ Smaller mark-ups reduce the borrowing capacity – and hence investments – of the less-affluent firm owners
- ▶ Impact on economic performance depends on the degree to which the country integrates into the world economy:
 - “High” degree: Economic performance unambiguously improves as low-productivity firms are forced to exit
 - “Intermediate” degree: Economic performance may deteriorate through two different channels, both related to the credit market friction

Introduction (IV)

Preview of theoretical results (continued):

- ▶ The two adverse effects are called:
 - *Polarization effect*: Smaller firms are forced to use less productive technologies but are not driven out of the market
 - *Replacement effect*: Smaller firms produce less which requires the economy to spend more resources on trade-related costs

Preview of empirical results:

- ▶ Empirical analysis is based on a firm-level dataset (with a two-period panel structure) that includes 544 manufacturing firms
- ▶ Results are supportive of the key theoretical mechanism:
 - Reduction in tariff protection impairs access to finance enjoyed by smaller and medium-sized firms
 - Among larger firms, no such effect of tariff reductions on access to finance can be identified

Introduction (V)

Agenda:

- ▶ Related Literature
- ▶ The Closed Economy
- ▶ Integrating into the World Economy:
 - Overview / Assumptions
 - An Equilibrium with Intermediate Trade Costs
 - The Effects of Lower Trade Costs on Real Output
- ▶ From Autarky to Full Integration
 - From Autarky to Partial Integration
 - From Partial Integration to Full Integration
- ▶ Evidence on Trade and Access to Finance
- ▶ Summary and Conclusions

International trade and heterogeneous firms:

- ▶ Bernard et al. (2003), Melitz (2003), Melitz and Ottaviano (2008)
- ▶ Bustos (2011)

Credit market frictions and resource misallocation:

- ▶ Matsuyama (2000), Banerjee and Duflo (2005)
- ▶ Hsieh and Klenow (2009)
- ▶ Song et al. (2011)

International trade and credit market frictions:

- ▶ Banerjee and Newman (2004), Matsuyama (2005), Foellmi and Oechslin (2010)
- ▶ Feenstra et al. (2013), Manova (2013), Brooks and Dovis (2017)

The Closed Economy

Endowments, Technologies, and Preferences (I)

Assumptions:

- ▶ Continuum 1 of entrepreneurs who are heterogeneous regarding their capital endowment, ω_i , $i \in [0, 1]$, and their production possibilities
- ▶ Capital endowments are distributed according to $G(\omega)$, and the aggregate endowment is $K \equiv \int_0^\infty \omega dG(\omega)$
- ▶ Each entrepreneur is a monopoly supplier of a differentiated good
- ▶ All goods are produced with a simple technology that requires capital as the only input into production
- ▶ Following much of the CMF literature (e.g., Matsuyama, 2000), this technology is characterized by a non-convexity:

$$y_i = \begin{cases} bk_i & : k_i < \kappa \\ ak_i & : k_i \geq \kappa \end{cases}, \quad b < a, \quad (1)$$

The Closed Economy

Endowments, Technologies, and Preferences (II)

Assumptions (continued):

- ▶ The entrepreneurs' utility function is of the familiar CES-form,

$$U = \left(\int_0^1 c_j^{(\sigma-1)/\sigma} dj \right)^{\frac{\sigma}{\sigma-1}}, \quad \sigma > 1, \quad (2)$$

- ▶ and each entrepreneur maximizes (2) subject to

$$\int_0^1 p_j c_j dj = m(\omega_i), \quad (3)$$

where c_j and p_j are consumption and price of good j , respectively, and $m(\omega_i)$ is entrepreneur i 's nominal income

- ▶ Moreover,

$$\kappa < K(b/a)^{\sigma-1} \quad (R1)$$

The Closed Economy

Endowments, Technologies, and Preferences (III)

Implications:

- ▶ The equilibrium real price of good j is

$$\frac{p_j}{P} = \frac{p(y_j)}{P} \equiv \left(\frac{Y}{P} \right)^{\frac{1}{\sigma}} y_j^{-1/\sigma}, \quad (4)$$

where:

- $P \equiv (\int_0^1 p_j^{1-\sigma} dj)^{1/(1-\sigma)}$ is the CES price index
- $Y \equiv (\int_0^1 p_j y_j dj)$ is the aggregate nominal output

The Closed Economy

The Credit Market (I)

Assumptions:

- ▶ Entrepreneurs may borrow and lend in an economy-wide credit market
- ▶ The credit market is:
 - competitive in the sense that lenders and borrowers take the borrowing rate ρ as given
 - imperfect in the sense that borrowing at the equilibrium rate ρ may be limited
- ▶ Borrowing limit arises because repayment can be avoided by incurring a cost that is a fraction $\lambda \in (0, 1]$ of the current firm revenue, $p_i y_i$
- ▶ The parameter λ mirrors how well the credit market works:
 - λ close to 0: strong friction
 - λ close to 1: weak friction

The Closed Economy

The Credit Market (II)

Implications:

- ▶ Lenders will give credit only up to the point where the borrower has just the incentive to pay back – which means that:

$$\lambda p(y_i)y_i \geq \begin{cases} \rho(y_i/b - \omega_i) & : y_i < a\kappa \\ \rho(y_i/a - \omega_i) & : y_i \geq a\kappa \end{cases} \quad (5)$$

- ▶ Expressions (4) and (5) imply a maximum output level,

$$\bar{y} = \begin{cases} b(\omega + \lambda x \bar{y}^{(\sigma-1)/\sigma}) & : \omega < \omega_\kappa \\ a(\omega + \lambda x \bar{y}^{(\sigma-1)/\sigma}) & : \omega \geq \omega_\kappa \end{cases}, \quad (6)$$

where:

- ω_κ is the endowment required to be able to exactly invest κ units
- $x \equiv (Y/P)^{1/\sigma} / (\rho/P)$

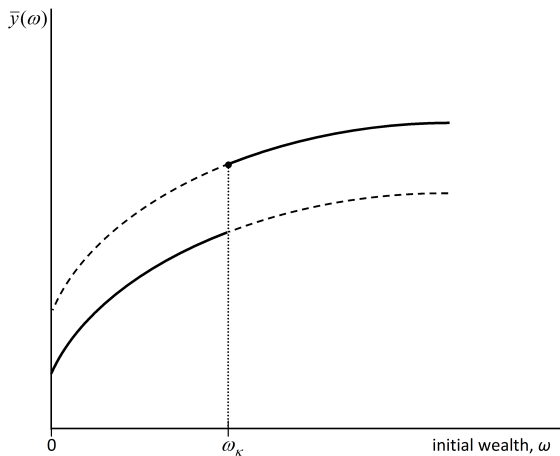
Implications (continued):

- * LEMMA 1: A firm's maximum output, $\bar{y}(\omega)$, is a strictly increasing function of the initial capital endowment, ω
- ▶ A higher ω means that an entrepreneur can invest more since:
 - there are more own resources under the entrepreneur's command
 - the borrowing capacity is higher as there is more “skin in the game”
- ▶ Note further that ($\rightarrow$ Figure 1):
 - the function is locally concave since the marginal return to investment falls in the investment level
 - there is a discontinuity at ω_K since, at that point, entrepreneurs switches to the more productive technology

The Closed Economy

The Credit Market (IV)

Figure 1— Maximum firm output



The Closed Economy

Actual Output Levels (I)

Entrepreneurs using the high-productivity technology ($\omega \geq \omega_\kappa$):

- ▶ Resources permitting, these entrepreneurs increase output up to the point where marginal revenues equal marginal costs
- ▶ The profit-maximizing output level is denoted by $\tilde{y}$ and $\tilde{\omega}$ is the wealth level which allows exactly for a production of $\tilde{y}$ units:

$$\tilde{y} = \left(ax \frac{\sigma - 1}{\sigma} \right)^\sigma \quad \text{and} \quad \tilde{\omega} = \left(1 - \lambda \frac{\sigma}{\sigma - 1} \right) \frac{\tilde{y}}{a}, \quad (7)$$

- * LEMMA 2: If $\lambda < (\sigma - 1)/\sigma$, firms with $\omega \in [\omega_\kappa, \tilde{\omega})$ produce the maximum output, $\bar{y}(\omega)$, and firms with $\omega \in [\tilde{\omega}, \infty)$ produce $\tilde{y}$. If $\lambda \geq (\sigma - 1)/\sigma$, all firms produce $\tilde{y}$.

The Closed Economy

Actual Output Levels (II)

Entrepreneurs using the low-productivity technology ($\omega < \omega_\kappa$):

- * LEMMA 3: Suppose $\lambda < (\sigma - 1)/\sigma$. Then, firms with $\omega < \omega_\kappa$ produce the maximum output, $\bar{y}(\omega)$.

Putting things together:

- Lemmas 2 and 3 imply that equilibrium firm outputs are given by

$$y(\omega) = \begin{cases} \bar{y}(\omega) & : \omega < \tilde{\omega} \\ \tilde{y} & : \omega \geq \tilde{\omega} \end{cases}, \quad (8)$$

where $\bar{y}(\omega)$ is implicitly determined by (6) and $\tilde{y}$ is given in (7)

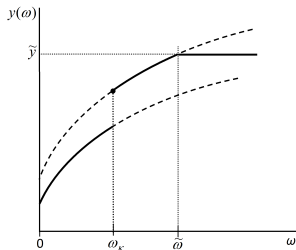
- Figure 2 shows two possible situations, $\omega_\kappa > 0$ (a.) and $\omega_\kappa \leq 0$ (b.)

The Closed Economy

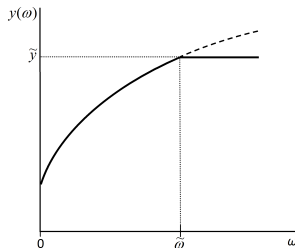
Actual Output Levels (III)

Figure 2 – Equilibrium firm outputs ($\lambda < (\sigma - 1)/\sigma$)

a. Some firms use the low-productivity technology



b. All firms use the high-productivity technology



The Closed Economy

Equilibrium under Autarky (I)

Capital demand and supply:

- ▶ So far, $x = (Y/P)^{1/\sigma}/(\rho/P)$ has been kept constant
- ▶ In equilibrium, x adjusts to ensure

$$\int_0^{\omega_K} \frac{\bar{y}(\omega; x)}{b} dG(\omega) + \int_{\omega_K}^{\tilde{\omega}} \frac{\bar{y}(\omega; x)}{a} dG(\omega) + \int_{\tilde{\omega}}^{\infty} \frac{\tilde{y}(x)}{a} dG(\omega) = K, \quad (9)$$

where the LHS is aggregate gross capital demand

The macroeconomic equilibrium:

- * PROPOSITION 1: There exists a unique macroeconomic equilibrium. If $\lambda < (\sigma - 1)/\sigma$, some entrepreneurs are credit-constrained (and the poorest ones may use the low-productivity technology). Otherwise, if $\lambda \geq (\sigma - 1)/\sigma$, no one is credit-constrained.

The Closed Economy

Equilibrium under Autarky (II)

The macroeconomic equilibrium (continued):

- ▶ The properties of the equilibrium are broadly consistent with a large body of evidence from developing countries
- ▶ We have a coexistence of:
 - more and less advanced technologies
 - high and low marginal (revenue) products of capital→ See Banerjee and Duflo (2005)
- ▶ There is variation in revenue productivities (TFPR) across firms, as has been documented for China and India
→ See Hsieh and Klenow (2009)

Integrating into the World Economy

Overview

Focus:

- ▶ The focus is now on how a reduction in trade barriers affects the equilibrium in the home economy
- ▶ We consider international trade between two trading partners, the
 - home economy (South) which represents a developing economy
 - rest of the world (North) which represents an advanced economy

Assumptions:

- ▶ 'Iceberg' trade costs: $\tau \geq 1$ units of a good have to be shipped in order for 1 unit to arrive at the destination region
- ▶ Northern markets work perfectly (i.e., there are no credit market frictions and the goods markets are perfectly competitive)
- ▶ The price level in the North is set to 1 (which means that the prices of all northern goods – and also the marginal cost – are 1)

Integrating into the World Economy

An Equilibrium with Intermediate Trade Costs (I)

Intermediate per-unit trade costs:

- ▶ Price of any good produced in the North and exported to the South is given by τ so that:
 - all southern producers face a northern competitive fringe
 - cannot set a price above τ
- ▶ To illustrate through which channels trade affects the economy, we first assume that τ is such that:
 - the price that would make domestic demand (for a given good) equal to an output of $a\kappa$ exceeds the upper bound τ
 - the profit-maximizing price charged by entrepreneurs who are not credit-constrained lies below the upper bound

Formally, with $p(y)$ given in (4), this means:

$$p(a\kappa) > \tau > p(\tilde{y})$$

Integrating into the World Economy

An Equilibrium with Intermediate Trade Costs (II)

Changes relative to the closed economy:

- ▶ An equilibrium with a positive mass of price-constrained entrepreneurs involves imports and hence exports – which pins down ρ :

$$\rho = a/\tau$$

- ▶ The fact that there is a binding upper bound on prices changes the $\bar{y}$ -function (for price-constrained firms):

$$\bar{y}' = \begin{cases} b(\omega + \lambda\tau\rho^{-1}\bar{y}') & : 0 \leq \omega < \omega_{\kappa}^I \\ a(\omega + \lambda\tau\rho^{-1}\bar{y}') & : \omega_{\kappa}^I \leq \omega < \omega_{\tau}^I \end{cases}, \quad (6')$$

where:

- $\omega_{\kappa}^I = (1 - \lambda\tau^2) \kappa$
- $\omega_{\tau}^I = (1 - \lambda\tau^2) (Y/P)(\tau/P)^{-\sigma}/a$

Integrating into the World Economy

An Equilibrium with Intermediate Trade Costs (III)

Required parameter restrictions (for the case analyzed first):

- ▶ To ensure that $p(a\kappa) > \tau > p(\tilde{y})$:

$$\frac{\sigma}{\sigma - 1} < \tau^2 < \frac{1}{\lambda}. \quad (\text{R2})$$

- ▶ To ensure that the low-productivity technology is used:

$$a/b < \tau^2 \quad (\text{R3})$$

Integrating into the World Economy

An Equilibrium with Intermediate Trade Costs (IV)

Establishing the equilibrium – aggregate exports:

- ▶ In a balanced trade equilibrium, the total value exports must be equal to the total value of imports
- ▶ In formal terms,

$$EXP = YP^{\sigma-1}\tau^{1-\sigma}G(\omega_{\tau}^I) \quad (10)$$

$$-\tau \int_0^{\omega_{\kappa}^I} \frac{b}{1 - \lambda\tau^2 b/a} \omega dG(\omega) - \tau \int_{\omega_{\kappa}^I}^{\omega_{\tau}^I} \frac{a}{1 - \lambda\tau^2} \omega dG(\omega),$$

where (on the RHS):

- 1st term on 1st line: Total expenditure on goods that are imported
- 1st term on 2nd line: Value of production by firms with $\omega < \omega_{\kappa}^I$
- 2nd term on 2nd line: Value of production by firms with $\omega_{\kappa}^I \leq \omega < \omega_{\tau}^I$

Integrating into the World Economy

An Equilibrium with Intermediate Trade Costs (V)

Establishing the equilibrium – resource constraint:

- ▶ The credit market equilibrium condition is now given by

$$\int_0^{\omega_K^l} \frac{1}{1 - \lambda \tau^2 b/a} \omega dG(\omega) + \int_{\omega_K^l}^{\omega_\tau^l} \frac{1}{1 - \lambda \tau^2} \omega dG(\omega) + \int_{\omega_\tau^l}^{\tilde{\omega}} \frac{\bar{y}^l(\omega)}{a} dG(\omega) + \int_{\tilde{\omega}}^{\infty} \frac{\tilde{y}}{a} dG(\omega) + \tau \frac{EXP}{a} = K$$

- ▶ Taking (10) into account gives

$$\int_0^{\omega_K^l} \frac{1 - \tau^2 b/a}{1 - \lambda \tau^2 b/a} \omega dG(\omega) + \int_{\omega_K^l}^{\omega_\tau^l} \frac{1 - \tau^2}{1 - \lambda \tau^2} \omega dG(\omega) + \int_{\omega_\tau^l}^{\tilde{\omega}} \frac{\bar{y}^l(\omega)}{a} dG(\omega) + \frac{1}{a} YP^{\sigma-1} \tau^\sigma \left(\frac{\sigma-1}{\sigma} \right)^\sigma [1 - G(\tilde{\omega})] + \frac{1}{a} YP^{\sigma-1} \tau^{2-\sigma} G(\omega_\tau^l) = K$$

Integrating into the World Economy

An Equilibrium with Intermediate Trade Costs (VI)

The macroeconomic equilibrium:

- * PROPOSITION 2: Suppose that (R2) and (R3) hold. Then, there is a unique equilibrium where (i) the poorest entrepreneurs use the low-productivity technology; (ii) all poorer ones are price-constrained; (iii) all richer entrepreneurs set the profit-maximizing price; (iv) the richest ones export parts of their output
- ▶ The properties of the equilibrium are broadly consistent with stylized facts (see, e.g., Bernard et al., 2003)
- ▶ In particular, we have that exporting firms
 - are the biggest ones and are more productive than the average firm
 - are a small minority (if the set of richest entrepreneurs is small)

Integrating into the World Economy

The Effects of Lower Trade Costs on Aggregate Output/Productivity (I)

Polarization effect (–):

- ▶ A fall in τ forces some firms to switch from the high-productivity to the low-productivity technology:
 - The maximum price τ decreases while $\rho = a/\tau$ rises so that small firms make lower profits and hence can put up less collateral
 - Less collateral implies a lower borrowing capacity so that some additional firms turn unable to meet the κ –threshold
- ▶ As a result, the number of firms using the low-productivity technology, $G(\omega'_\kappa) = G((1 - \lambda\tau^2)\kappa)$, increases
- ▶ The impact on aggregate firm productivity is ambiguous, though. The share of K invested in low-productivity firms is:

$$\frac{1}{1 - \lambda\tau^2 b/a} \int_0^{\omega'_\kappa} \omega dG(\omega) / K$$

Integrating into the World Economy

The Effects of Lower Trade Costs on Aggregate Output/Productivity (II)

Replacement effect (—):

- ▶ A fall in τ forces the remaining price-constrained high-productivity firms to produce less (as credit constraints become tighter):

$$\bar{y}'(\omega) = \frac{1 - \lambda}{1 - \lambda\tau^2} a\omega$$

- ▶ As a result, part of the output that used to be produced by these firms needs to be replaced with imports from abroad
- ▶ This replacement is a source of inefficiency because it leads to an increase in aggregate trade costs

Better availability of consumption goods (+):

- ▶ A fall in τ reduces the dispersion of prices and mark-ups
- ▶ Individuals thus consume a more balanced basket of goods

From Autarky to Full Integration

From Autarky to Partial Integration (I)

Overview:

- ▶ How is aggregate real output is affected by the three different channels as trade costs fall from prohibitive levels to zero?
- ▶ Analysis is based on:
 - the general model when we explore the impact of τ at the border (called τ^{AT}) between the “no-trade” and the “trade” equilibrium
 - a model version relying on a two-point distribution when we explore the impact of τ if $\tau < \tau^{AT}$

Trade costs and real output at τ^{AT} :

- * PROPOSITION 3: Consider an equilibrium where the poorest entrepreneurs use the low-productivity technology. Suppose further that $\tau = \tau^{AT}$. Then, a (marginal) reduction in trade costs, τ , leads to a fall in aggregate real output, Y/P :

$$d(Y/P)/d\tau|_{\tau=\tau^{AT}} > 0$$

From Autarky to Full Integration

From Autarky to Partial Integration (II)

Trade costs and real output at τ^{AT} (continued):

- ▶ Output falls although some smaller firms rely on the low-productivity technology (and the supply of goods is particularly uneven)
- ▶ This result continues to hold in the alternative case where all firms have access to the high-productivity technology under autarky
- ▶ The negative impact of international trade in the neighborhood of τ^{AT} is due to the fact that:
 - the adverse replacement effect has first-order consequences
 - the improvement in consumption possibilities is a second-order effect

From Autarky to Full Integration

From Partial Integration to Full Integration (I)

A specific distribution:

- ▶ We assume a two-point distribution:
 - A fraction β of entrepreneurs (the “poor”, P) is endowed with $\omega_P = \theta K$, where $\theta < 1$
 - A fraction $1 - \beta$ of entrepreneurs (the “rich”, R) is endowed with $\omega_R = (1 - \beta\theta)K / (1 - \beta)$
- ▶ Advantage: Real output and group-specific real incomes can be calculated explicitly (which is done in the paper . . .)
- ▶ Here: Focus on numerical example

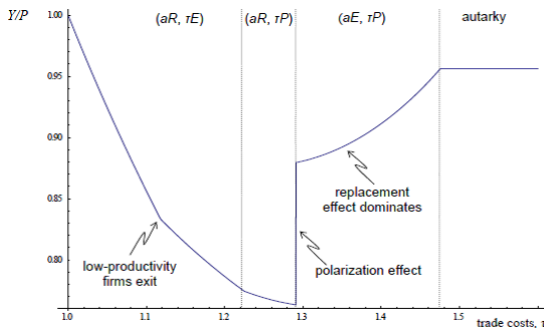
Two different situations:

- ▶ Figure 3: “Mild” credit-market friction
- ▶ Figure 4: “Severe” credit-market friction

From Autarky to Full Integration

From Partial Integration to Full Integration (II)

Figure 3 – Real output as a function of τ

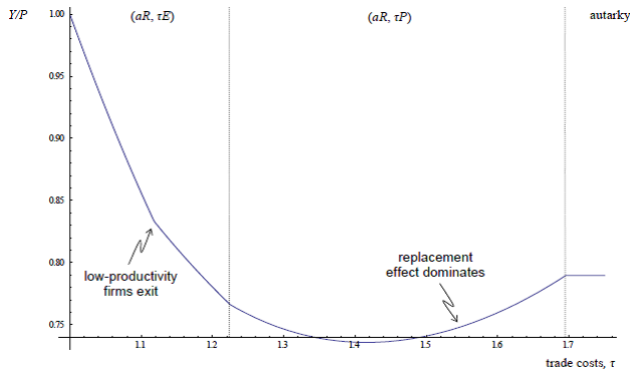


$$K = 1, a = 1, b = 0.8, \beta = 0.8, \kappa = 0.6, \lambda = 0.2, \sigma = 3, \theta = 0.4$$

From Autarky to Full Integration

From Partial Integration to Full Integration (III)

Figure 4 – Real output as a function of τ (“severe” CMF)



$$K = 1, a = 1, b = 0.8, \beta = 0.8, \kappa = 0.6, \lambda = 0.1, \sigma = 3, \theta = 0.4$$

Evidence on Trade and Access to Finance (I)

Overview:

- ▶ There is substantial evidence on the relationship between firm size and credit constraints (e.g., Beck and Demirguc-Kunt, 2006)
- ▶ Only little is known, however, about the effect of trade openness on access to finance by (smaller) firms
- ▶ We present some new findings in this regard

Data:

- ▶ We rely on a firm-level dataset that has recently been put together by Foellmi, Legge, and Tiemann (2016)
- ▶ The dataset combines two data sources:
 - WBES: Provides firm-level survey data, including information on access to finance, firm size, and industry classification
 - WITS: Provides information on tariff rates at the four-digit ISIC level

Evidence on Trade and Access to Finance (II)

Data (continued):

- ▶ The dataset covers all Latin American countries,
 - in which firms were interviewed twice (in 2006 and 2010)
 - for which tariff rates were available,
i.e., Argentina, Bolivia, Chile, Colombia, Paraguay, Peru, Uruguay
- ▶ Our regression sample consists of 544 manufacturing firms:
 - which were interviewed in both years
 - which did not change industry between 2006 and 2010
- ▶ Main variable of interest is *FIN_CONS*,
 - a dummy variable that takes on the value 1 if a firm responds “access to finance” (atf) when asked . . .
 - . . . which element of the business environment represents the biggest obstacle (15 possible answers)

Evidence on Trade and Access to Finance (III)

Two (related) questions:

- ▶ Did the share of firms saying “atf” increase by more in the subset of firms which were in industries that saw a substantial tariff reduction?
- ▶ Is the negative effect (if any) of such a substantial tariff reductions on access to finance stronger among smaller firms?
- ▶ We consider tariff cuts of 0.5 percentage points or more to be substantial

Results: Table 1,

- ▶ Panel A: Sample of smaller firms includes firms with less than 20 employees (i.e., firms classified as small by WBES)
- ▶ Panel B: Sample of smaller firms consists of firms with less than 100 employees (i.e., firms classified as either small or medium-sized)

Evidence on Trade and Access to Finance (IV)

Table 1 — Tariff protection and access to finance

	substantial tariff reduction (1)	no substantial tariff reduction (2)	substantial tariff reduction (3)	no substantial tariff reduction (4)
<i>PANEL A:</i>				
	small firms		medium-sized and large firms	
Share of firms with <i>FIN_CONS</i> = 1 in 2006	0.020	0.138	0.106	0.114
Share of firms with <i>FIN_CONS</i> = 1 in 2010	0.100	0.124	0.133	0.106
Difference estimator	0.080* (0.095)	-0.014 (0.729)	0.027 (0.541)	-0.008 (0.769)
DiD est. (country fixed effects included)	0.111^ (0.142)		0.110* (0.059)	
Number of observations	50	145	113	236
<i>PANEL B:</i>				
	small and medium-sized firms		large firms	
Share of firms with <i>FIN_CONS</i> = 1 in 2006	0.083	0.129	0.071	0.1
Share of firms with <i>FIN_CONS</i> = 1 in 2010	0.132	0.125	0.095	0.057
Difference estimator	0.049 (0.215)	-0.004 (0.904)	0.024 (0.697)	-0.043 (0.350)
DiD est. (country fixed effects included)	0.135*** (0.003)		0.006 (0.965)	
Number of observations	121	311	42	70

Note: *p*-values in parentheses; ***, **, *, and ^ denote significance at the 1, 5, 10, and 15% levels, respectively; the *p*-values are based on *t*-tests with unequal variances (difference estimator) or robust standard errors (difference-in-difference estimator).

Summary and Conclusions (I)

Main points:

- ▶ We study the macroeconomic implications of a fall in trade barriers in a monopolistically competitive economy with credit-market frictions
- ▶ We show that a piecemeal proportional reduction in trade barriers
 - may/must have a negative impact on aggregate real output
 - may have a negative effect on aggregate firm productivityalthough the average markup and the dispersion of markups fall
- ▶ The reason is that lower trade barriers imply lower markups and hence less access to finance for smaller firms (something we see in the data)
- ▶ The deterioration in the access to finance has two adverse effects:
 - *Polarization effect*: More smaller firms are forced to use the low-productivity technology
 - *Replacement effect*: Trade costs increase as loss in output needs to be replaced with imports

Summary and Conclusions (II)

Main points (continued):

- ▶ This finding echoes an insight highlighted by Bhagwati (1971):

Lowering trade barriers may lead to losses if the result is an even sharper deviation of the actual output distribution from the undistorted distribution

- ▶ From this perspective, the contribution here is that to show that credit-market friction exactly imply such harmful adjustments