

# *Financial Choice in a Non-Ricardian Model of Trade*

Katheryn N. Russ<sup>1</sup>    Diego Valderrama<sup>2</sup>

<sup>1</sup>Department of Economics  
University of California, Davis and NBER

<sup>2</sup>Federal Reserve Bank of San Francisco  
Franklin-Templeton and Associates

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# Financial Choice

*The combination of financial frictions faced by firms or investors*

- Firms choose between different credit instruments.
- The market for each credit instrument has different transaction costs.
- We propose that there is feedback between the decision to use different credit instruments and the decision to produce/export

## *How do financial choice and trade interact?*

- Does financial choice affect export behavior and the real exchange rate?  
(Yes)
  
- Does access to export markets affect firms' choice between different financial instruments, including aggregate measures of financial development?  
(Yes)

## *Results: Twitter version*

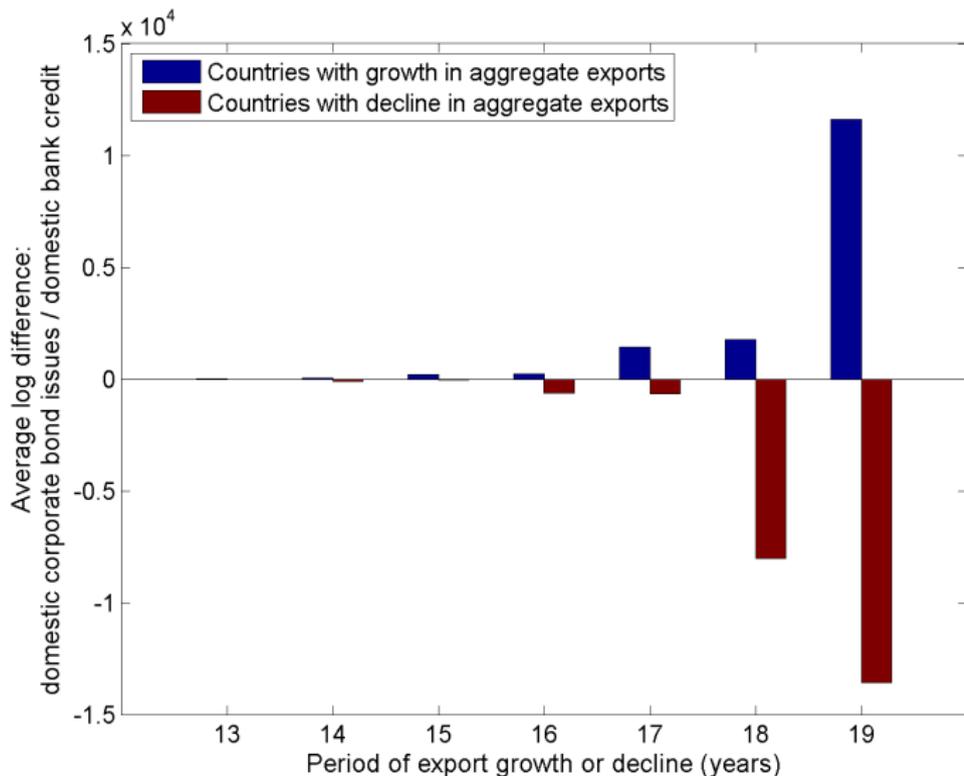
- Increased access to export markets boosts the relative size of the bond market, but making bank credit cheaper generates export-led growth
- Targeted development of either financial market yields similar welfare effects, much smaller than increasing access to export markets
- Targeted financial market development impacts the real exchange rate differently through intra-industry reallocation across firms of different size

# The problem

- No unified analytical framework: separate literatures on financial choice v. trade
- Both influence the distribution of firm size
  - ▶ Targeted financial market development can influence the distribution of firm size
  - ▶ Gains from trade may occur through intra-industry reallocation
  - ▶ Macroeconomic implications of interaction?
- Interaction:
  - ▶ Size of goods market (openness) is a constraint on firms' ability to overcome financial transaction costs
  - ▶ Use of a particular financial instrument affects marginal cost of capital and thus the profitability of exporting

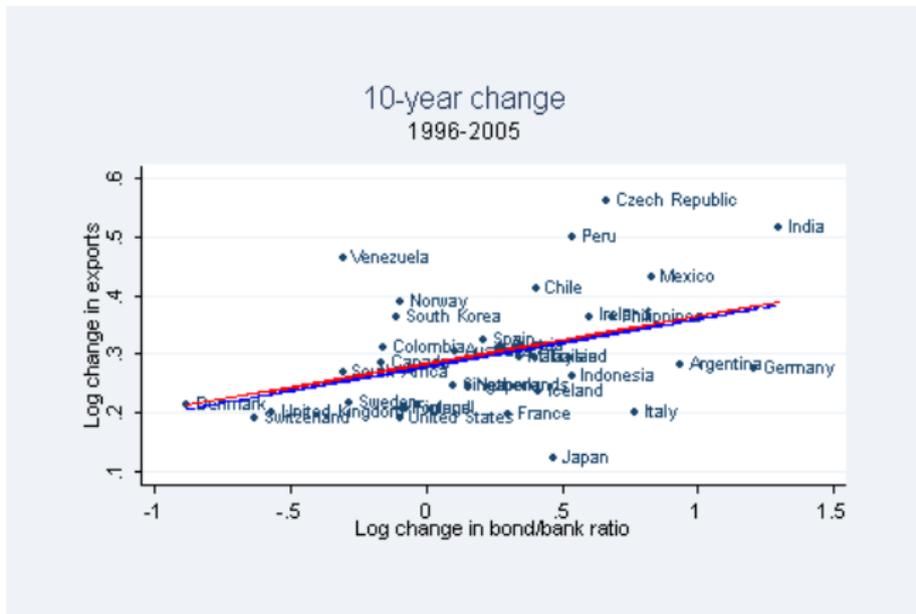
# Exports and financial choice (I)

Countries with trend growth in exports have trend growth in the ratio of domestic bond issues to bank credit



## Exports and financial choice (II)

Growth in level of exports positively correlated with growth in the size of local corporate bond markets relative to bank credit across countries



# *Related literature I*

## *Financial frictions and trade*

- Representative firm
  - ▶ Ju and Wei (2008)
  - ▶ Antras and Caballero (2009)
  
- Heterogeneous firms
  - ▶ Chaney (2005)
  - ▶ Manova (2008)

These models do not consider financial choice

# Related literature II

## Financial choice in general equilibrium

- closed economy, heterogeneous firms
  - ▶ de Fiore and Uhlig (2005)
  - ▶ Champonnois (2006,2010)
  - ▶ Ghironi and Lewis (2008)
  - ▶ Russ and Valderrama (2009)
  
- open economy
  - ▶ Razin and Sadka (2007): Focus on foreign investor
  - ▶ Smith and Valderrama (2009): Representative firm
  - ▶ Antras, Desai, and Foley (2009); Carluccio and Fally (2010): External finance versus FDI

These works do not analyze the relationship between financial choice, trade, and the distribution of firm size

## *A unified model*

- Endogenous number of heterogeneous, monopolistically competitive firms in a small open economy (c.f. Ghironi and Melitz 2005)
- Firms use both labor and capital as inputs for production, but must borrow funds to purchase capital
- Firms choose between bank and bond financing
  - ▶ “Monitored” bank lending  $\Rightarrow$  low fixed cost, high marginal cost
  - ▶ “Unmonitored” bond issues  $\Rightarrow$  high fixed cost, low marginal cost
  - ▶ Companion paper motivates these assumptions using (sparse) available data
- Analogous to models of technology adoption (Yeaple 2005, Bustos 2009), but with fully endogenous supply of labor and capital
  - ▶ Trade affects relative and absolute size of credit markets (**new**)

# Findings

- Both bank and bond market development increase welfare
- Opposite effects on the extensive margin, aggregate exports, and the real exchange rate
  - ▶ Increasing bank efficiency increases the extensive margin of trade and total exports, appreciates the real exchange rate
  - ▶ Reducing fixed costs of bond issuance reduces the extensive margin of trade and total exports, depreciates the real exchange rate
- Trade induces financial “upgrading”
  - ▶ Increasing access to export markets– by itself– increases the relative size of the bond market, as well as overall financial development
  - ▶ Lower financing costs are a new source of gains from trade

# Financial intermediaries: banks and bond markets

Transfer savings from households to firms

## Default

- Fraction  $\delta$  of firms default.
- Default means the intermediary incurs monitoring cost  $\mu_j$  and receives no interest on a loan or bond issue.

## Bank loans: “monitored lending”

Low fixed cost,  $f_l$ , high monitoring cost  $\mu_l$

## Bonds: “unmonitored lending”

High fixed cost of issuance  $f_b$ , low monitoring cost  $\mu_b$

WLG:  $\mu_b \equiv 0$

⇒ Spread between bond rate and bank rate

$$r_l = r_b + \frac{\delta \mu_l}{1 - \delta}.$$

## Financial choice and production

- Marginal producer will be a bank borrower if  $\frac{f_b}{f_l}$  is large enough relative to the spread
- Marginal exporter will be a bank borrower if the fixed cost of exporting  $f_x$  is not “too large”
- If any bank borrower exports, all bond issuers export.

## Numerical Results

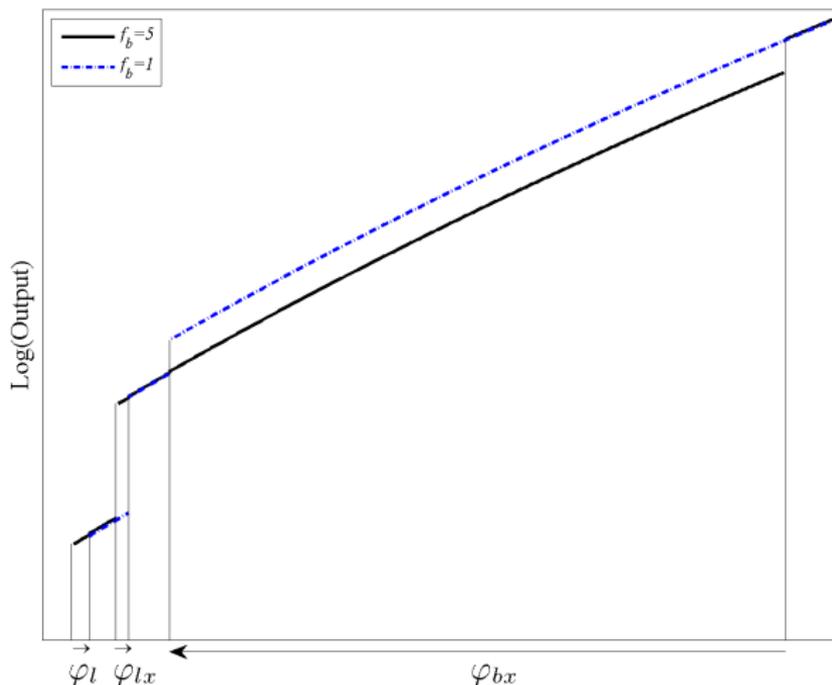
### *Reduce bond issuance costs $f_b$*

- from 5: bond issuance costs 10 times as large as fixed cost of bank credit (approximating Pakistan)
- to 1: bond issuance costs twice as large as fixed cost of bank credit (approximating United States)

### *Reduce bank monitoring costs $\mu$*

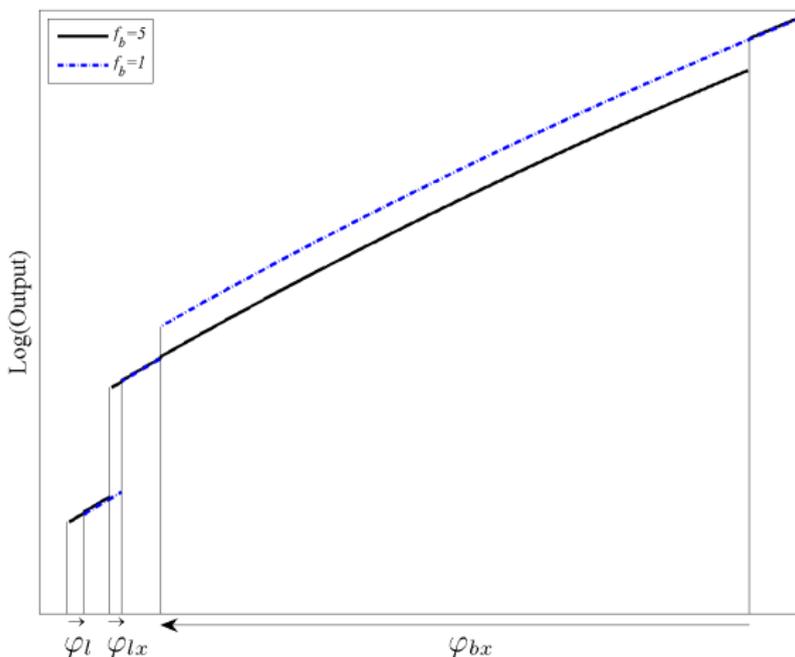
- from 0.3: approximating level “loss given default” in Latin America
- to 0.1: approximating level “loss given default” in United States/Portugal

↓  $f_b$  reallocates output toward medium-sized producers



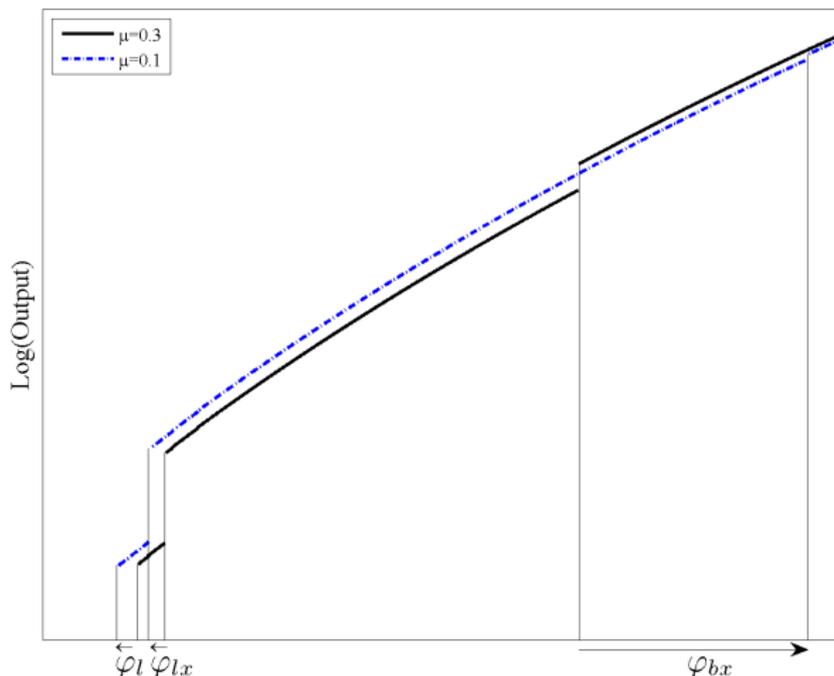
- Largest bank borrowers switch to bond issuance as a source of credit
- Switchers have lower marginal cost of capital, cut their prices

↓  $f_b$  reallocates output toward medium-sized producers



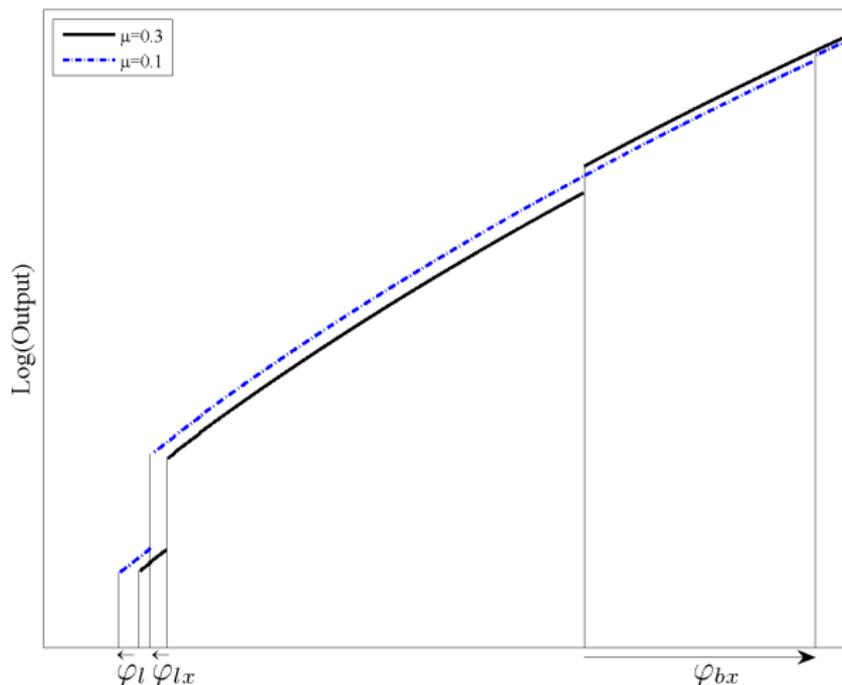
- Remaining (less efficient) bank borrowers **lose** market share to switchers
- Increase in exports among switchers < decrease among quitters
- Reduction in extensive margin of trade and in aggregate exports

↓  $\mu_l$  reallocates output toward smaller producers



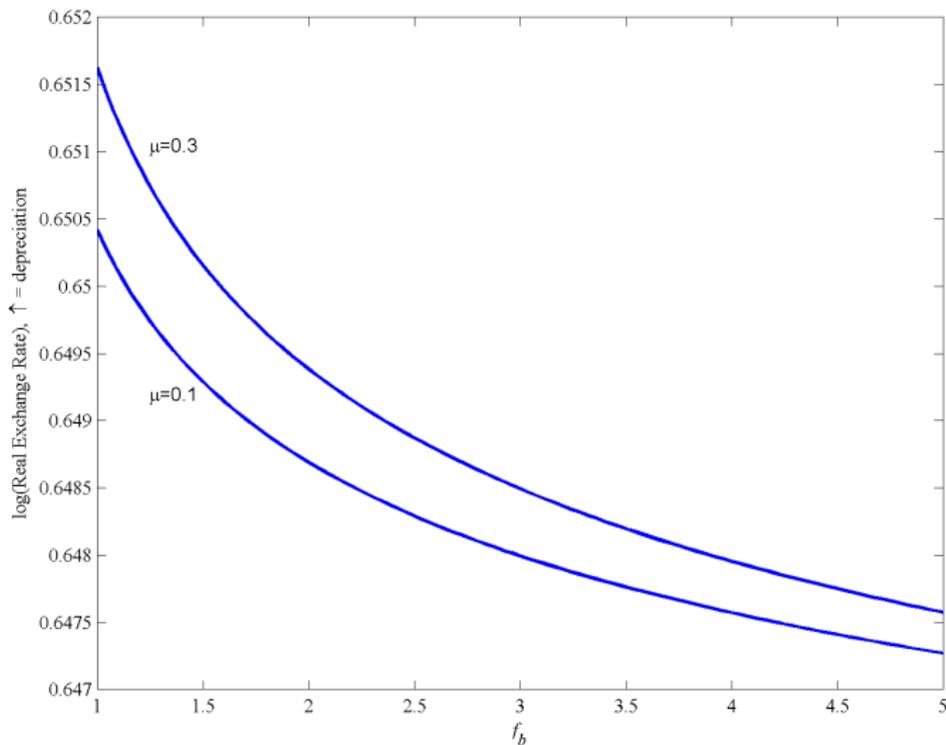
- Smallest bond issuers switch to bank loans as a source of credit
- Switchers have higher marginal cost of capital, increase their prices

↓  $\mu_l$  reallocates output toward smaller producers

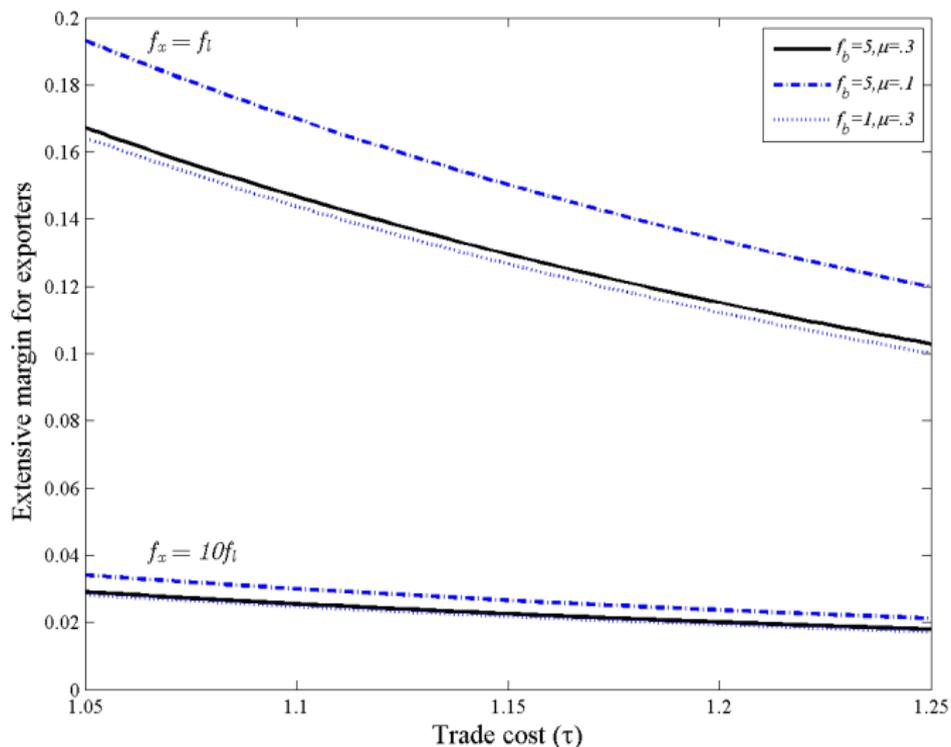


- Remaining (less efficient) bank borrowers **gain** market share from switchers
- Expansion of the extensive margin of trade and increased aggregate exports

The real exchange rate *depreciates* as bond issuance costs fall, but *appreciates* as bank monitoring costs fall



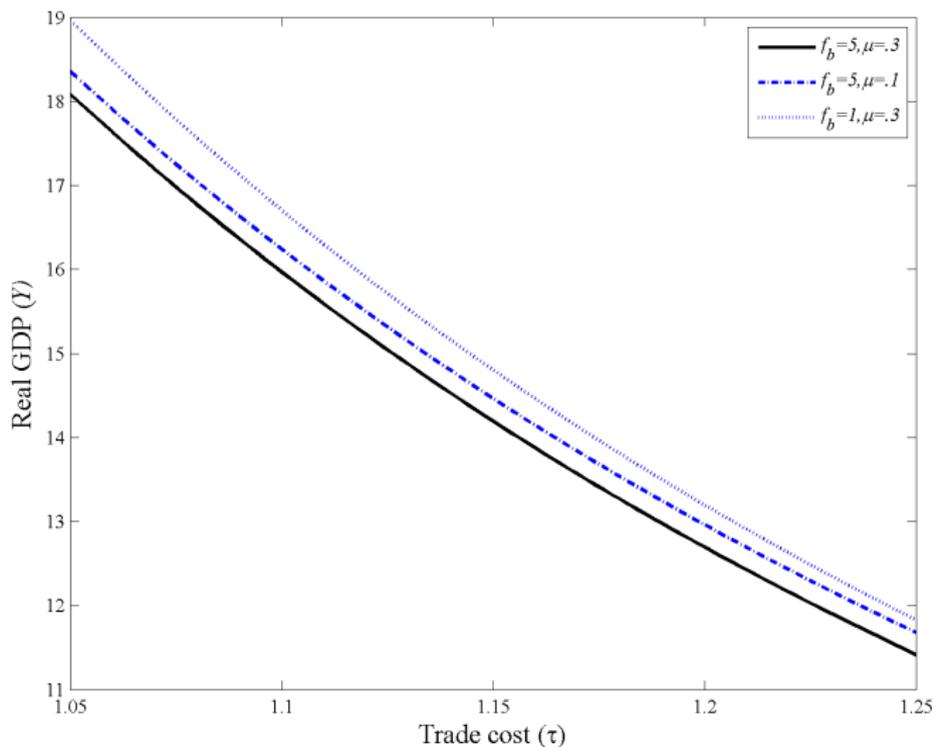
*Extensive margin of trade falls as bond issuance costs fall,  
rises as bank monitoring costs fall*



## *Increased access to export markets ( $\downarrow \tau$ ) generates financial switching into bond issuance*

- Increases the relative size of the bond market
  - ▶ Some exporters grow enough to switch to bonds
  - ▶ Exporters who already issue bonds expand
- Increases the extensive margin of trade and total exports
- Positive correlation between exports and relative size of bond market
- Increases output, consumption, the real wage rate and welfare– financial switching has small influence size of gains

*Lowering issuance cost accelerates gains from trade liberalization, lowering monitoring cost dampens them*



# Conclusions

## *Bank versus bond market development*

- Making bank credit cheaper results in export-led growth
- Targeted bond market development generates growth, but can dampen exports
- Similar welfare effects

## *Increased access to export markets*

- Generates financial “upgrading”
  - ▶ Lowers costs of capital and the reallocates production toward more efficient switchers  $\Rightarrow$  lower domestic prices on these goods
  - ▶ A new source of gains from trade
- Increases relative size of bond market, total private credit
- Much bigger welfare effect than financial market development, doubles impact of bond market development

# Exports and financial choice (I)

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