The role of finance in production and international trade*

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Abstract

We *introduce finance in a neo-classical general equilibrium model of production and international trade to integrate the core microeconomic theory with the theory of finance*. The stock of credit, as past savings, finances employment and the acquisition of machines or capital goods. The availability of finance or international financial flows does not affect production or trade patterns, *except for nominal factor prices,* in undistorted competitive structures. However, *distortions such as unemployment, imperfect credit markets, and factor mobility do affect real outcomes and trade*. Our results are *consistent with contemporary empirical evidence and have policy implications for financial development and institutional quality.* Numerical illustrations provide further insights. Finance capital ***could have neutral as well as non-neutral impacts on real interest rate, wage, and employment***. These aspects are quite crucial esp. after economies are hit hard due to financial crises or pandemic-led credit crunch.
JEL Classification: B12, B17, F11, F63, F65, F16, O12;
Keywords: General Equilibrium, Trade, Credit Rationing, Financial Development, Unemployment.

Lacunae and Point of Departure

The usual approach to incorporating the impact of financial problems in trade models has been to consider the ***role of trade credit or trade finance for exports/imports.***

- ***Chor and Manova (2012):*** *adverse impacts of tightened credit conditions, particularly* ***access to trade credit, on export volumes.***
- ***Manova (2013):*** *analysis within a firm-heterogeneity model featuring imperfect competition, discussing* ***the role of financial market imperfections and frictions in shaping trade volume.***
- ***Wittwer (2021):*** *role of* ***connecting or integrating financial markets for*** *achieving higher welfare and efficient transactions.*
- ***Kabir et al. (2024):*** *effect of* ***trade finance for boosting exports or global sales*** *is* ***pronounced for financially-constrained firms with finance-intensive products.***
- ***Fuchs et al. (2022):*** *role of* ***credit availability and supply-side barriers*** *for financially constrained vendors in Africa.*
- *However, the* ***importance of finance or credit for carrying out production for trade has received much less attention****, unlike the* ***typical 'trade-finance' literature****,*
- ***Shifting the focus from trade-credit or financing of trade*** *and commercial transactions*
- ***Incorporating financial capital into the analysis of issues related to production, trade, and growth****, enhancing understanding of the* ***definitive role of finance (capital) in standard trade models.***
- ***Here, we examine the issue where credit finances purchase of factor input services, labor costs, capital goods, and other material inputs,*** *consider* ***the consequences of changes in the availability of this 'financial capital' and how it can alter production structure, trade patterns, and factor returns.***
- ***Reveal the role of finance in production and trade patterns and volumes with or without distortions such as, Minimum wage-led unemployment and credit-rationing.***

Research Question: Highlights

- ***Access to financial capital is crucial*** for firm performance, trade flows, economic growth, and employment. Trade volumes hinge on production capabilities.
- During ***financial crises or even pandemic, many firms struggle to survive*** due to disruptions in short-term financing.
- Despite the central role of credit in enabling production and trade, **traditional trade models have largely overlooked the financial aspects of the problem.**
- This paper ***fills this gap by incorporating entrepreneurial finance and borrowing constraints into a standard general equilibrium (GE) trade framework***. One-Period Static Model
- ***The fundamental question we address is***: **How significant is the *role of finance availability in an otherwise standard neoclassical general equilibrium trade model***, when financial capital is necessary to purchase the services of labor and machines or capital goods to produce final goods? ***Impacts on Returns to Factors***?

Core contribution: **extension of the canonical production model in trade theory** to

- **(i) explicitly incorporate the role of credit in financing production** across different supplying countries; implications for **understanding the macroeconomic effects of credit market imperfections**
- **(ii) derive numerical implications for how monetary policy or financial conditions can shape counterfactual scenarios**, such as the dynamics of financial crises;
- **(iii) the distributional impacts on production and trade patterns, elucidate the role of easy money policies**, default risks, and entrepreneurial finance during financial debacle.

Framework and Model

General Equilibrium a la **Jones (1965, 2018).** and Marjit and Das (2021), Marjit and Nakanishi (2023)- ***See the Published Vn in NAJEF (2024) for references.***

- ***ASSN:*** **Small Open Economy, Perfect Competition, Constant Returns to Scale, Mobile homogeneous Labor (L), and Machines with fixed Coefficients production** (return **W and Pm**) for **X =X (M, L); Y = Y (M, L). X is M-intensive while Y is L-intensive.**
- **Demand for Finance/Credit, K = WL+ Pm.M (Eq. 1).**
- 7 endogenous variables to solve from 7 equations. **Key Equations are:**

$$[Wa_{Lx} + p_M a_{Mx}](1+r) = P \quad (2)$$

$$[Wa_{Ly} + p_M a_{My}](1+r) = 1 \quad (3)$$

$$a_{LX}X + a_{LY}Y = L \quad (4)$$

$$a_{MX}X + a_{MY}Y = M \quad (5)$$

$$K^d = W(r).L + p_M(r).M \quad (6)$$

Financial market equilibrium condition

$$K^d(r) = \overline{K}$$

$$r = r(P, \overline{L}, \overline{M}, \overline{K}) \quad (9)$$

$$(\widehat{W}, \widehat{p_M}) < 0 \text{ if } \widehat{(1+r)} > 0$$

$$\frac{P}{(1+r)} = \overline{W}a_{LX} + p_M a_{MX} \quad (13)$$

$$B + K_e = \overline{W}L_e + p_M M \quad (23)$$

$$B = \frac{qS}{(1+R)-qS}K_e \quad (22)$$

Analytical Results

Proposition 1*: Availability of finance does not affect* $\frac{W}{P_M}$*; but affects 'W' and 'p_M' via changes in 'r'.*

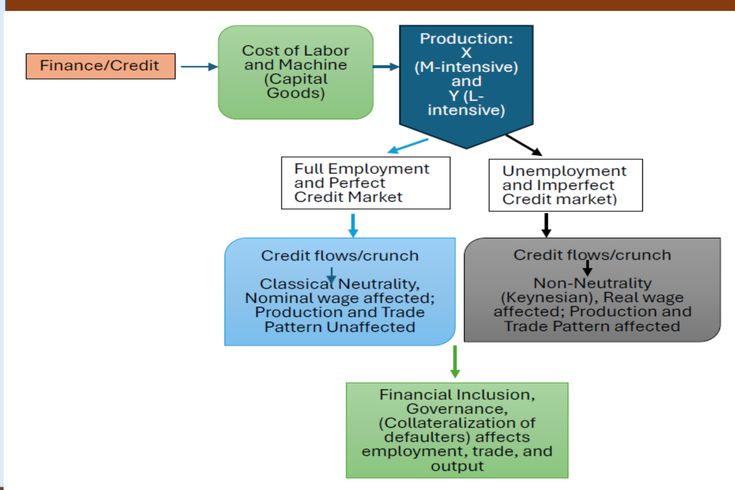
Proposition 2: *Given* $P = \overline{P}$, $\hat{L} = 0, \widehat{M} = 0$, $\widehat{K_S} > 0$ *does not affect trade patterns.*

Proposition 3: *Given M=M*, L=L*, and* $\widehat{K} > 0$*, without capital control, FPE will hold.*

Proposition 4: *Financial boom* ($\widehat{K} > 0$) *or crisis* ($\widehat{K} < 0$) *affects trade patterns, relative price 'P',* $\frac{\overline{W}}{P_M}$*, in a minimum wage driven unemployment equilibrium.*

Proposition 5: *Given* $\overline{P}$*, as* $(qS) > (qS^*)$ *i.e., with higher extent of collateralization via institution or financial development, we have* $L_e > L_e^*$. $\widehat{L_e} = \frac{\widehat{qS}(B/K_e)}{A1 - A2.\frac{B}{K_e}}$

CONCEPTUAL FLOW CHART



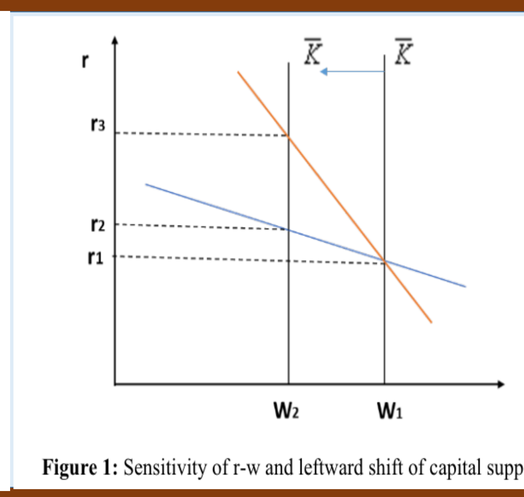


Figure 1: Sensitivity of r-w and leftward shift of capital supply

Intuitive Explanation

Proposition I and II:. ***Without any distortion,*** *Real wage is unaffected. This result is analogous to the canonical macroeconomic systems where credit is similar to money supply and it has neutrality in the same sense that it affects absolute factor prices pM and W, but not the relative ones and the output itself as X and Y do not change.* ***No effects on Trade Patterns with K****.*

Proposition III: *At a given P and the same L and M,* **if one country has larger K (K>K*), only (1+r) will be smaller, W and Pm both will be higher but W/Pm will be same. X/Y will be same as M/L is same.** P will be the same and **no commodity trade occurs**. But ***as (1+r) is smaller, given a chance K will flow out to get higher return*** squeezing both W and Pm. ***Two countries with the same L and M*** can still engage in **trade in factors of production iff higher amount of finance attracts workers and machines and drive away capital or credit.** Factor trade **complements** Commodity Trade unlike HOS model with K-flows or migration. FPE holds.

Proposition IV: With unemployment, *finance plays pivotal role with cash-in-advance or easy money to affect employment, export and import****—non-neutrality/Keynesian result.***
Given P, in this case, extra cash-in-advance will increase employment and will determine Le, X and Y ***(i.e., real changes or non-neutrality unlike the full employment scenarios****). With min wage, finance affects production, trade, rel. price and real wage. It will export Y, import X with TOT effects.*

Proposition V: With imperfect credit market, credit rationing and borrowing constraints with default risk, *W is lower. Collaterization depends on risk of default due to penalty.* ***Banks then charge higher interest than the deposit rate. Employment increases with higher probability of penalty of defaulter with better institution.*** *Countries suffering from financial underdevelopment (****qs really low****) ,greater autarkic inequality might be able to reduce inequality through trade.*

Conclusion and Policy insights

(1) in a *full employment setting without any distortions*, the level of available finance does not impact the pattern of trade but influences factor prices and the prevailing interest rate, absolute levels of factor prices (Classical Dichotomy/Money Neutrality).
(2) Shortage of finance increases r and machine-intensive technological progress (robotics!) tends to stimulate production of X and Pm/W rises at a given P, **causing a sustained decline in share of labor income all across the world.**
(3) Credit market imperfections impact unemployment, finance plays a pivotal role. **Greater credit-finance increases global income and employment (Non-Neutrality: Keynesian Outcome).** Shortage of finance does not hurt capital owners that much, but definitely the workers.
(4) with borrowing constraints and credit rationing and some default risk, financiers collateralize defaulters' assets. ***Production will suffer for both, affecting volume of trade*** without altering the trade pattern. ***Cash-in-advance or Easy Money Policy*** could facilitate production.

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Accepted in North American Journal of Economics and Finance (forthcoming January 2025)
https://doi.org/10.1016/j.najef.2024.102273