

Financial development and central bank bilateral currency swaps: Is there trade effect?

Abdullahi Ahmed Mohammed

Department of Business and Management, Tishk International University, Kurdistan Region, Iraq
Corresponding author: mohammed.abdullahi@tiu.edu.iq, abdullaham138@gmail.com

Article Info

Article history:

Received 20 January 2024

Accepted 09 April 2024

Published 29 April 2024

JEL Classification Code:

B17, P34, P45, Q27.

Author's email:

mohammed.abdullahi@tiu.edu.iq

abdullaham138@gmail.com

DOI: [10.20885/ejem.vol16.iss1.art7](https://doi.org/10.20885/ejem.vol16.iss1.art7)

Abstract

Purpose — This paper aims to empirically investigate the impact of currency swaps on international trade, given China's differential level of financial development and its currency swap partners.

Methods — The study employs an empirical structural gravity model using datasets encompassing financial development, trade, and intuitive gravity equation variables for 27 countries from 1980 to 2013. The level of financial development and swaps was captured by the interaction term of the disaggregated measure of financial development, such as access, depth, and efficiency, each interacting with currency swaps.

Findings — The findings suggest that currency swaps are essential for trade and exhibit a large trade effect, especially for countries with relatively low levels of financial development. The paper substantiates empirical evidence indicating disparities in financial development across countries, and such differences are important in determining trade patterns.

Implication — Strong financial systems promote trade in advanced economies, whereas the opposite holds true for developing countries. The examination of the influence of financial systems on trade through empirical tests remains important on the research agenda of policymakers and researchers, especially those looking at industry-level import and export data.

Originality — The study delves into the nexus between financial development and trade within the framework of the Central Bank bilateral currency swap network by highlighting the role of financial institutions and market size (depth), activity (access), and efficiency. In addition, it addresses the drawbacks of previous empirical research that largely focuses on the private credit-to-GDP ratio as a key proxy for financial development.

Keywords — Financial development, central banks, RMB bilateral currency swap line, trade.

Introduction

The spread of Central Bank currency swaps since the financial crisis of 2007 has received substantial recognition around the global economy amongst Central Banks (Aizenman et al., 2011; Aizenman & Lee, 2008; Aizenman & Pasricha, 2010; Destais, 2016; Fawzy & Abd, 2021; Horn et al., 2023; Liao & McDowell, 2015; Lin et al., 2016; Lu et al., 2023; Mohammed, 2019b, 2019c; Perez Saiz & Zhang, 2023). The agreement allows a Central Bank in one country to exchange currency, usually its domestic currency, for a determined amount of foreign currency from the People's Bank of China (PBOC). The recipient Central Bank offers lending facilities to its domestic banks from the foreign currency obtained from the provider (Peoples' Bank of China (PBOC)) on its own

predetermined terms and conditions and risks. Swaps involving the People's Bank of China (PBOC) were one of the most important and rapidly growing swap networks in the space of international finance (Fawzy & Abd, 2021; Jiang et al., 2023; Lai & Yu, 2015; Lin et al., 2016; Mohammed, 2019; Perez Saiz & Zhang, 2023). Equally, currency swap usage may provide a buffer against financial crises in recent times. Which allows countries that subscribe to the arrangement to boost liquidity access in their financial systems.

In this manner, the study sheds light on the economies that have subscribed to China's cross-currency swap line (RMB swap line) since 2008 as a form of international financial derivative to facilitate trade. Thus, the People's Bank of China's (PBOC's) RMB swap line and the counterparties (signatories) to the agreement will be the focal point of our empirical investigation in terms of financial development and trade. In line with some of the earlier studies, for example, Levine (2003) argued that the debate about financial development and trade-cum growth still needs to be settled. The study addresses one central concern: whether there is too much financial development or too little. Also, can economists measure it well? Arcand et al. (2015) used the private credit to GDP to examine whether there is too much finance, and Becerra et al. (2012) pointed out that several countries still have too little finance. In both theoretical and empirical literature, financial development and the degree of international trade openness are among the key variables the economic growth literature highlights as being highly connected with growth performance across countries (e.g Beck, 2002; Darrat et al., 2006; Demetriades & Andrianova, 2004; Demirgüç-Kunt & Levine, 2009; Ductor & Grechyna, 2015; Guariglia & Poncet, 2008; Levine, 1997, 2003; Manova, 2013).

Similarly, one important source of financial development documented in the small but growing literature on international trade focuses on two variable relations between international trade and financial development (Beck, 2002; Beck et al., 2010; Braun & Raddatz, 2005; Do & Levchenko, 2004). International trade greatly differs in the world's most open and least open countries. For example, Argentina, one of the relatively least open economies, witnessed a trade volume of some 20% as a percentage of GDP compared to Singapore, which had around 440% throughout 1971 – 2010. For example, the average financial development traditionally measured by the domestic credit private sector (% of GDP) is more than 22 times higher in the most financially developed country like Japan compared to the least developed such as Ghana see Kiendrebeogo (2012)

Rajan and Zingales (2003) suggest that empirical findings based on the two-variable relationship will likely be misleading and incomplete. Furthermore, the Rajan and Zingales studies suggested three variable relationships: financial development, trade openness, and financial openness. Particularly, they maintained that trade openness without financial openness may not yield higher financial development, and they verified the hypothesis using data from 24 industrialized countries from the span of 1913 – 1999. Rajan and Zingales (2003) utilize the interest group theory to benchmark their findings. Their results argued that Interest groups, mainly industrial and financial incumbents, perhaps stand to lose from financial development. Since financial development provides new opportunities for new entrant firms to enter the market, this propels competition and erodes the incumbents' interests. They argued that financial development will weaken when the economy is open to trade and finance.

Baltagi et al. (2009) verify Rajan and Zingales (2003) hypothetical assertion using data drawn for developing and industrialized countries. They show the interactive effects of trade and financial openness on financial development. The interaction between trade openness, financial openness, and trade can be used to investigate the marginal effect of increasing trade (financial) openness on financial development conditional on financial (trade) openness. In addition, the financial system is considered an endowment; therefore, disparities across the country lead to different levels of trade performance. With identical technology and factor endowments between countries, comparative cost varies when countries differ in their respective institution of credit enforcement, see Kiendrebeogo (2012).

However, the interaction between the recipient and swap provider regarding currency swap, trade, and financial development is not yet clear. Understanding financial development and trade within the currency swap network is equally relevant. Similarly, a large empirical literature has established the importance of financial development for growth and trade; at the same time, a

fragile and overleveraged financial system may bring about a major crisis, as experienced in 2007, see Čihák et al. (2012).

This paper aims to empirically investigate the impact of currency swaps on international trade, given the differential level of financial development of both China and its currency swap partners. In addition, our empirical investigation seeks to assess the extent to which the mixture of financial institutions and markets influences trade. In the bid to examine whether too much or too little finance drives the bilateral currency swap agreement, we visually inspect the graphical plots of the financial development index for the 27 RMB currency swap recipients in both advanced and emerging economies (see Figure 2).

This paper, to the best of our knowledge, makes significant contributions to the existing literature in investigating the impact of financial development and trade in the light of the Central Bank bilateral currency swap network by highlighting the role of financial institutions and market size (depth), activity (access), and efficiency. In addition, we seek to overcome the drawback in major empirical work that largely focuses on ratio of private credit to GDP as a key proxy of financial development, see (Arcand et al., 2015; Becerra et al., 2012; Bencivenga & Smith, 1991; Blackburn & Hung, 1998; Darrat et al., 2006; Kiendrebeogo, 2012)¹.

The empirical findings in this study reinforce the intuition that financial development affects trade patterns positively. Moreover, the results show that bilateral currency swap enables countries to boost their liquidity access in the financial system and financial transactions with a large trade effect. Furthermore, the paper substantiates the empirical evidence that differences in financial development amongst countries differ, and such differences are important in the determination of trade patterns. However, we gauge and compare our empirical findings with some existing empirical studies on China's currency swap. For example, Lai and Yu (2015) evaluate the potential of the Renminbi for the denomination of cross-border transactions in the Asia-Pacific region. Their findings reveal a convex relationship between a currency's invoicing share and the issuing country's economic size because of a coalescing effect and thick market externalities. Similar findings were documented as in (Aizenman et al., 2011; Destais, 2016; Horn et al., 2023; Jiang et al., 2023; Liao & McDowell, 2015; Lin et al., 2016; Perez Saiz & Zhang, 2023). However, our study corroborates the empirical evidence that differences in financial development amongst countries differ, and such differences are important in determining trade patterns.

The remainder of the paper is organized as follows. Section 2 describes the data and econometric method used in the study, Section 3 presents the main results and discussion, and Section 4 concludes.

Research Method

The econometric model aims to examine the effect of financial development on trade flows in light of China's bilateral currency swap line. The study seeks to investigate the relationship between currency swaps in the light of financial development and trade, the following panel regressions à la structural gravity in line with Head and Mayer (2014) as follows:

$$X_{ni} = \frac{Y_i}{S_i} \frac{X_n}{M_n} \Phi_{ni}, \quad (1)$$

Where $Y_i = \sum_n X_{ni}$ is exporter income, $X_n = \sum_i X_{ni}$ is importer expenditure on all source destination, Ω_i and Φ_n are “multilateral resistance” term defined as follows:

$$\Phi_n = \sum_\ell \frac{\Phi_{n\ell} Y_\ell}{\Omega_\ell} \text{ and } \Omega_\ell = \sum_\ell \frac{\Phi_{n\ell} X_\ell}{\Phi_\ell} \quad (2)$$

The key and apparent feature of structural gravity is its multiplicative form. After taking logs, this denotes that the effect of multilateral resistance term can be captured by exporter and importer fixed effects. While Φ_{ni} captures a vector of bilateral trade cost variables, which includes RTAs and bilateral currency swaps:

¹ Recently, Čihák et al. (2012) and Sviryzdenka (2016) have introduced expanded versions of financial development and the recent trend in the database structure of development in financial institutions and markets across countries.

$$\ln X_{ni} = \ln G + \ln S_i + \ln M_n + \ln \Phi_{ni} \quad (3)$$

Moreover, another key characteristic of structural gravity is that trade flows between n, and i are affected by third countries only through Ω_i and Φ_n terms, which are specific to n and I, respectively. Once armed with measures of income and expenditure for each country and bilateral trade costs for all country pairs, those terms can be solved easily. In what follows, we incorporate the disaggregated measures of financial development into the structural gravity setup.

$$X_{ni,t} = \beta_1 \ln S_i + \beta_2 \ln M_n + \beta_3 FIA_{i,t} + \beta_4 FIA_{n,t} + \beta_5 \lambda'_{ni,t} + \beta_6 FIA_{i,t} * \lambda'_{ni,t} + \beta_7 FIA_{n,t} * \lambda'_{ni,t} + \gamma_{ni} + \rho_i + \mu_n + \varepsilon_{it} \quad (4)$$

Where $X_{ni,t}$ is the measure of bilateral trade between country i and n. $FIA_{i,t}$ and $FIA_{n,t}$ denotes financial institution access for both country i and n respectively, i.e. degree to which firms can and do use financial services. We use the percentage of firms with lines of credit to measure access. The $\ln S_i$ factor represents "capabilities" of exporter i as a supplier to all destinations. $\ln M_n$ captures all characteristics of destination market n that promote imports from all sources, in order words, the respective exporter income and importer expenditure of country i and n. $FID_{i,t}$, and $FID_{n,t}$ capture the financial institution depth, which is measured by the standard banking sector depth proxy (private credit to GDP). This proxy is defined as domestic private credit to the real sector by deposit money banks, excluding credits issued by central banks and credit issued to government agencies and public enterprises.

Similarly, $FIE_{i,t}$ and $FIE_{n,t}$ denotes the financial institution efficiency measures the banking sector efficiency in intermediating savings to investment, as proxied by the net interest margin (an equivalent of an accounting value of banks' net interest revenue as a share of its average interest-bearing assets) and lending – deposit spread. $\lambda'_{ni,t}$, is a dummy variable that captures the central bank bilateral currency swap of China (Renminbi swap line) signed by both Advanced and Emerging economies to exchange principal and interest payment in two different currencies at fixed intervals.³ During the life of the cross-currency swap each offers interest in the currency of the principal received. While at the swap's maturity, both parties exchange the principal amount back to back. The $FID * \lambda'_{ni,t}$, is an interaction term between financial institution depth and the currency swap variable. It investigates how deep financial institutions are with the existence of the bilateral currency swap line. γ_{ni} captures the country pair fixed effects, ρ_i denotes country i fixed effects, and μ_n denotes country n fixed effects.

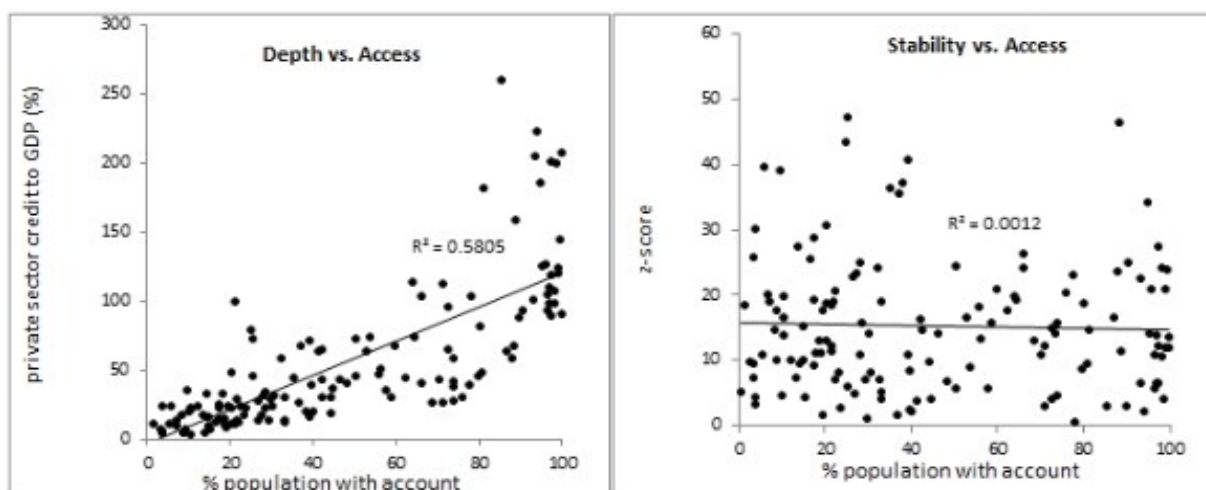
Source of Data and Measurement of Variables

The data is compiled from the IMF database to analyze the impact of trade, currency swap, and disaggregated measures of financial development in 27 countries that signed China's currency swap network using data from 1980 to 2013 obtained from IMF's international financial statistics database. The financial development is disaggregated into six different measures of financial development, namely, financial institutions size (depth) (FID), access (activity) (FIA), efficiency (FIE) and financial markets size (depth) (FMD) access (activity) (FMA), and efficiency (FME). The six sub-indices measure how deep, accessible, and efficient financial markets and institutions are overall across countries and time. In addition, these sub-indices are aggregated into higher-level sub-indices, FI and FM, which capture how developed financial institutions and markets are across the globe. Overall, FI and FM sub-indices are aggregated into the overall measure of financial development (FD index). Figure 1 indicates the correlation between financial institutions and market sub-indices. The data set, trade data relies on the direction of trade statistics (DOTs), and real GDP comes from the World Bank's *World Development Indicators (WDI)*.

² (See Head and Maye, 2014)

³ $\ln X_{ni,t} = \beta_1 \ln S_i + \beta_2 \ln M_n + \beta_3 FID_{i,t} + \beta_4 FID_{n,t} + \beta_5 \lambda'_{ni,t} + \beta_6 FID_{i,t} * \lambda'_{ni,t} + \beta_7 FID_{n,t} * \lambda'_{ni,t} + \gamma_{ni} + \rho_i + \mu_n + \varepsilon_{it}$ (5)

$\ln X_{ni,t} = \beta_1 \ln S_i + \beta_2 \ln M_n + \beta_3 FIE_{i,t} + \beta_4 FIE_{n,t} + \beta_5 \lambda'_{ni,t} + \beta_6 FIE_{i,t} * \lambda'_{ni,t} + \beta_7 FIE_{n,t} * \lambda'_{ni,t} + \gamma_{ni} + \rho_i + \mu_n + \varepsilon_{it}$ (6)



Source: World Bank Data calculations based on the Global Financial Development

Figure 1. Financial depth, stability, and inclusion

Beck et al. (2010), Čihák et al. (2012), World Bank (2012), and Svirydzenka (2016) introduced financial development incorporated into both the IMF and World Bank database structure, which presents the expanded and updated trends in structure and development of financial institution and markets across time and countries. The database provides new multi-dimensional measure of financial development that comprises the size (depth) of financial institutions and markets, the degree to which individuals use financial services (access), and the efficiency of financial intermediaries and markets in intermediating resources and facilitating financial transactions (efficiency) of the financial system see Čihák et al. (2012).

Table 1. 3 x 2 Matrix of Financial System Characteristics

	Financial Institutions	Financial Markets
Depth	Private credit to GDP Pension fund to GDP Mutual fund to GDP Insurance premiums and non-life to GDP Gross value-added of the financial sector to GDP	Stock market capitalization plus outstanding domestic private debt securities to GDP Private debt securities to GDP Public debt securities to GDP International debt securities to GDP Stock market capitalization to GDP Stocks traded to GDP
Access	Accounts per thousand adults (commercial banks) Branches per 100,000 adults (commercial banks) % of people with a bank account % of firms with line of credit (all firms) % of firms with line of credit (small firms)	Percent of market capitalization outside of the top 10 largest companies Percent of value traded outside of top 10 traded companies Government bond yields (3 months and 10 years) Ratio of domestic to total debt securities Ratio of private to total debt securities (domestic) Ratio of new corporate bond issues to GDP
Efficiency	Net interest margin Lending-deposits spread Non-interest income to total income Overhead costs (% of total assets) Profitability (return on assets, return on equity) Boone indicator (or Herfindahl or H-statistics)	Turnover ratio (turnover/capitalization) for the stock market Price synchronicity (co-movement) Private information trading Price impact Liquidity/transaction costs Quoted bid-ask spread for government bonds Turnover of bonds (private, public) on securities exchange Settlement efficiency

Source: Calculations based on the Global Financial Development Database and Čihák et al. (2012) and World Bank (2012) and (Svirydzenka, 2016).

The measures were highlighted in bold. All the newly constructed dimensions of financial development measured both financial institutions and financial markets to take account of the overall financial system. The matrix below in Table 1 contains a subset of measures of financial development for the dimensions defined by the 3x2 matrix.

Results and Discussions

Table 2 shows that overall financial development has a positive impact on trade, and, to some extent, that translates to other sub-indices, such as access efficiency and depth. Furthermore, the results show that the estimated parameters of the disaggregated measures of financial development measure of origin and destination of currency swap, i.e., China and the recipients' partners, are statistically significant at 1 percent level. However, the magnitude of each component of financial development relatively differs. First, Currency swap results suggest a high impact on trade, suggesting a huge trade effect. Also, the results in Table 3 depict a positive effect on trade for both the swap provider (financial development in the origin country, i.e. China) and signatories (financial development in the destination country)⁴.

Table 2. Currency Swap and Disaggregated Measures of Financial Development

Dependent variable: Exports	(1)	(2)	(3)	(4)	(5)	(6)
FIA_Destination	0.476*** (0.060)					
FIA_Origin	0.226*** (0.076)					
Currency swap	0.695*** (0.117)	0.889*** (0.102)	0.889*** (0.103)	0.897*** (0.117)	0.805*** (0.103)	0.903*** (0.104)
FID_Destination		0.410*** (0.057)				
FID_Origin		0.146** (0.066)				
FIE_Destination			0.449*** (0.097)			
FIE_Origin			0.233*** (0.088)			
FMA_Destination				0.201*** (0.029)		
FMA_Origin				0.112*** (0.030)		
FMD_Destination					0.188*** (0.031)	
FMD_Origin					0.118*** (0.031)	
FME_Destination						0.038* (0.022)
FME_Origin						0.006 (0.021)
Observations	15,402	15,402	15,402	14,663	15,402	13,676
R-squared	0.616	0.616	0.615	0.615	0.615	0.559

In addition, that also suggests that currency swaps can also substitute or complement reserves apart from their usage for trade, which is a safety verve in case of unexpected shortages in international liquidity. Although there could be a limit to which swap line can be used, the usage is

⁴ FIA_Destination/FIA_Origin (Financial institutions access), FID_Destination/FID_Origin (Financial institutions depth), FIE_Destination /FIE_Origin (Financial institutions efficiency), FMA_Destination/FMA_Origin (Financial market access), FMD_Destination/FMD_Origin (Financial market depth), FME_Destination/FME_Origin ((Financial market efficiency). Financial institutions and market development in the origin denote China as the initiator of the swap line, while Financial institutions and market development in the destination denote swap recipients.

determined by the recipient's level of financial development and the provider's credibility. Another evidence suggests that swap lines are motivated essentially by the self-interest of the provider (China), but the benefits are substantial for recipient countries. This result contrasts [Lin et al. \(2016\)](#), who found that economic factors, political considerations, and institutional characteristics, including trade intensity, economic size, strategic partnership, free trade agreements, corruption, and stability, affect the decision to sign a swap line agreement. [Liao and McDowell \(2015\)](#) argued that the presence of preferential trade agreements (PTAs) and bilateral investment treaties (BITs) would increase the probability of dyadic BSA cooperation.

More so, other studies corroborate the findings of [Liao and McDowell \(2015\)](#) and [Lin et al. \(2016\)](#) on China's currency swap. For example, [Lai and Yu \(2015\)](#) evaluate the potential of the Renminbi for the denomination of cross-border transactions in the Asia-Pacific region. Their findings reveal a convex relationship between a currency's invoicing share and the issuing country's economic size because of a coalescing effect and thick market externalities. Similar findings were documented as in ([Aizenman et al., 2011](#); [Destais, 2016](#); [Horn et al., 2023](#); [Jiang et al., 2023](#); [Liao & McDowell, 2015](#); [Lin et al., 2016](#); [Perez Saiz & Zhang, 2023](#)). Indeed, our study substantiates the empirical evidence that differences in financial development amongst countries differ, and such differences are important in the determination of trade patterns ([Aizenman et al., 2011](#); [Baltagi et al., 2009](#); [Čihák et al., 2012](#); [Demirgüç-Kunt & Levine, 2009](#); [Menyah et al., 2014](#); [Niroomand et al., 2014](#)).

For instance, for a provider like China, swaps are useful in safeguarding their economic interest in those countries where they extend the swap lines. Similarly, the currency swap interests may take different dimensions for the provider – e.g., significant export share or market in the swap destinations. For recipient countries, swaps can foster financial stability, especially when reserves cannot reassure markets during the financial crisis, mainly for countries with low financial development and weak macroeconomic fundamentals. Therefore, swaps may possess mutual benefits that are not only a last resort in the period of crisis but also in good times. Swap lines can be formalized or institutionalized from a temporary anti-crisis measure to a long-term financial tool to boost liquidity, especially when precautionary reserve holding is necessary.

All things being equal exporter income or origin (Exp_Income) and importer or destination expenditure (Imp_Exp) predicted a positive impact on trade in line with the conventional trade structural gravity equation literature (see Table 3). Overall, the alternative measures of financial development have in Table 3 depicts the estimation results for the gravity equation with disaggregated measures of financial development index across the countries that are signatories to the bilateral currency swap line.

Moreover, another key impact that our model illustrates is that swap and alternative financial development measures affect trade differently.⁵ For example, swap cum financial development interaction term is negative and significant at 1% level. Row 5 and 7 indicate a complete set of swap interaction terms paired with the financial institution and market sub-indices that include access, depth, and efficiency.

This allows the effect of other regressors on trade to be affected differentially for countries with high and low levels of financial development. The results indicate that RMB currency swap matter for trade differentially based on countries level of financial development. It is evident and well documented in the literature that differences in financial development amongst countries are substantial and are key determinants of trade patterns (see Figure 2). Also, the negative impact of financial development and swap interaction on trade should be attributed to disparity in terms of financial development across China's swap line partners. Visual inspection of Figure 2 depicts the varying level of financial development of China's swap line partners. In addition, the negative coefficients of the interaction enter with negative results, which means that a low level of financial development is likely to drive the currency swap line.

⁵ The extent of financial access, depth, and efficiency of a country's financial system determines the local demand and supply for external finance like currency swap lines. Therefore, the impact of swap on trade is expected to be differential across countries. Suppose trade results in increased specialization in financially dependent commodities, which leads to the growth of the financial system. Conversely, countries that rely on the imports of financially dependent commodities rather than produce them domestically weaken their financial systems because of trade opening, *ceteris paribus*.

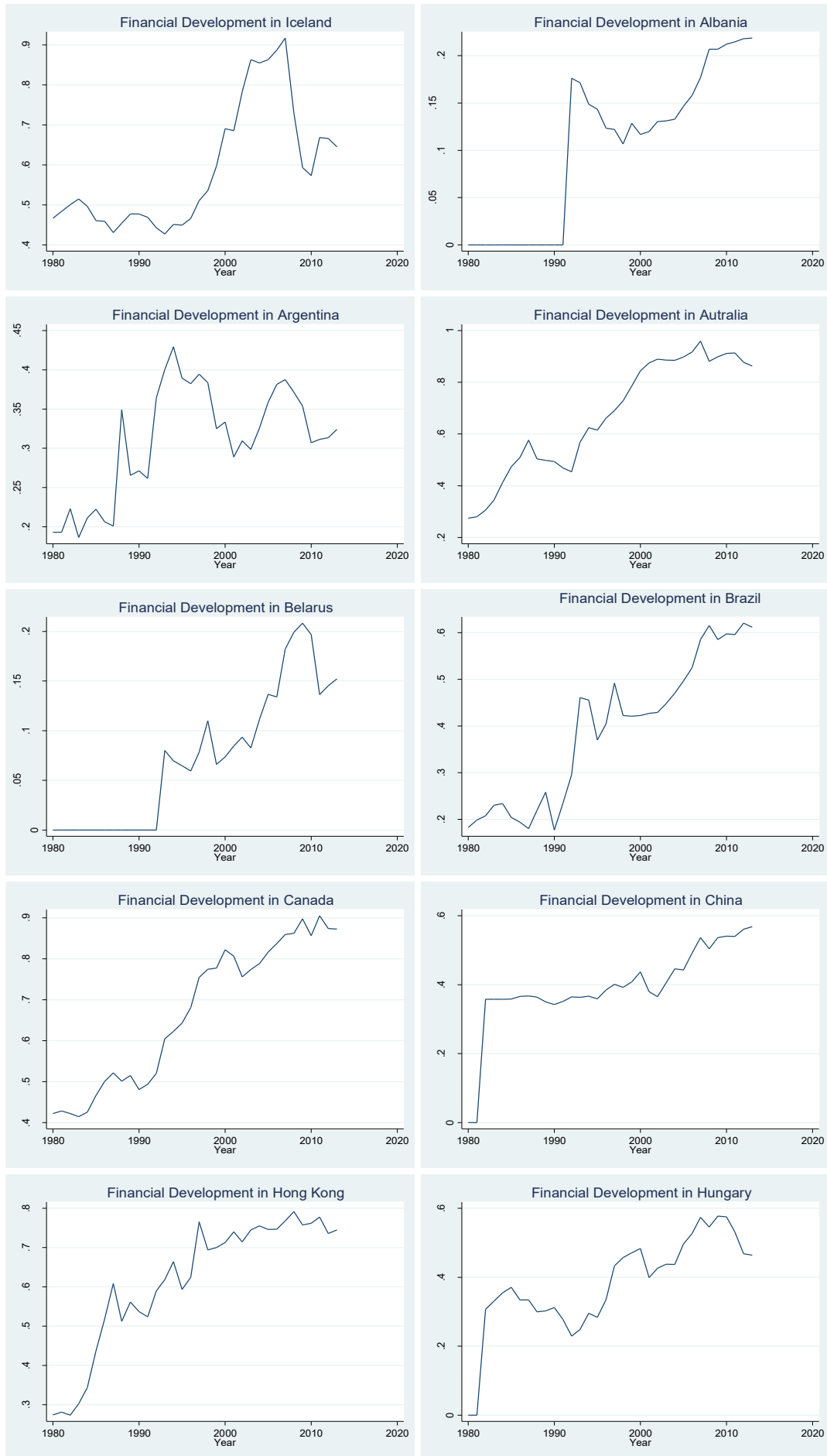
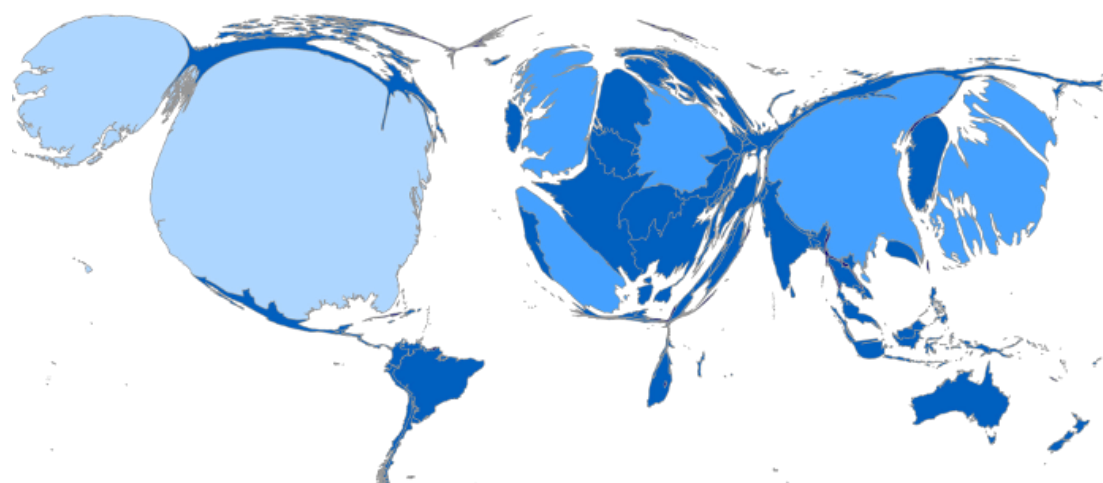


Figure 2. Financial Development of Bilateral Currency Swap Recipients

Table 3. Structural Gravity Equation, Currency Swap, and Financial Development

	[1]	[2]	[3]	[4]	[5]	[6]
Exp_Income	0.900*** (0.111)	0.993*** (0.105)	1.030*** (0.100)	1.044*** (0.106)	1.022*** (0.102)	1.087*** (0.106)
Imp_Exp	0.880*** (0.090)	0.991*** (0.085)	1.092*** (0.088)	1.047*** (0.089)	1.058*** (0.090)	1.067*** (0.091)
FinDev_Destina tion	0.394*** (0.054)	0.303*** (0.055)	0.363*** (0.095)	0.0778*** (0.030)	0.0820*** (0.029)	0.00338 (0.019)
FinDev_ Origin	0.161** (0.072)	0.0364* (0.065)	0.131** (0.086)	-0.0107 (0.028)	0.0127* (0.028)	0.0358* (0.0190)
FinDev_Destina tion#swap	-0.031* (0.155)	-0.233** (0.099)	-0.969*** (0.296)	-0.0868 (0.082)	-0.225*** (0.065)	-0.158*** (0.051)
FinDev_ Origin#swap	-0.026* (0.147)	-0.514** (0.865)	-0.4.61* (0.404)	-0.313* (0.326)	-0.749* (0.645)	-0.72** (0.084)
Currency swap	0.695*** (0.117)	0.889*** (0.102)	0.889*** (0.103)	0.897*** (0.117)	0.805*** (0.103)	0.903*** (0.104)
Observations	15,300	15,300	15,300	14,565	15,300	13,582
R-squared	0.671	0.616	0.673	0.611	0.652	0.6132
Fixed effects	Yes	Yes	Yes	Yes	Yes	Yes

**Figure 3.** The Uneven Size of Financial System across the Globe

The cartogram in Figure 3 depicts the uneven development of financial systems worldwide. For instance, Russia's financial system far exceed that of China, and Germany's alone is bigger than the combined financial systems of the entire sub-Saharan Africa, indeed, the disparities are huge.⁶ More so, in Table 3 the level of financial development – cum currency swap was captured by the interaction term of the disaggregated measure of financial development such access, depth, and efficiency each interacted with swaps. Overall, results further suggest that financial access, depth and efficiency has different impacts on trade both in China and its trading partners that are in the Renminbi swap line. Moreover, our empirical evidence reaffirms the relevance of both financial institutions and markets access, depth and efficiency for trade as positively depicted row 3 and 4 of Table 3. Notably, large declines in the access and depth index reflect the volatility of returns by financial institutions in many countries and most financial markets. More so, another implication of the positive impact of financial institutions and market access, depth and efficiency on trade indicates high financial requirement for China and its trading partners. More so, industrial incumbents have an incentive to face competition in financial markets and demand for more

⁶ Recent evidence suggests that banking crises negatively influence international trade flows through their effect on trade-finance-cum growth see for example (Hussain & Mohammed, 2017; Kiendrebeogo, 2012; Manova, 2013; Mati et al., 2024; Mohammed, 2016; Mohammed et al., 2017; Mohammed, 2019c, 2019a).

external finance like swaps. This will push for greater access and efficiency for firms that intends to recover investments or main the status quo.

Conclusion

The paper provides empirical evidence that currency swaps are important for trade, especially for countries with relatively low levels of financial development. The analysis shows that differences in development amongst countries are substantial, and such differences are important in determining trade patterns. Furthermore, our empirical evidence reveals that differential level of financial development determines whether a country can adopt currency swap lines for international trade or not. In Advanced countries, strong financial systems promote trade; the opposite is true in developing countries. Empirical tests on the influence of the financial system on trade remain on the research agenda, especially looking at industry-level import and export data.

Similarly, economies with a well-developed financial system tend to have faster growth. Consequently, finance is not only pro-growth but also pro-poor economies, suggesting that financial development can serve well the less developed economies to catch up with the rest of the world (Baltagi et al., 2009; Demirgüç-Kunt & Levine, 2009; Menyah et al., 2014; Niroomand et al., 2014). Furthermore, the theory of endogenous growth, as articulated by Greenwood and Jovanovic (1990) and Bencivenga and Smith (1991), among others, maintained that financial development is a vital factor in strengthening long-run growth given that finance helps in fostering growth via efficient intertemporal allocation of resources, technological innovation, and capital accumulation.⁷ Similarly, cross-country evidence establishes the coexistence of positive long-run and negative short-run relationships between trade flows and financial development, as in Kim et al. (2010). Levine (2005) stressed that financial development is accompanied by the enhancement of production *ex ante* information on possible investment opportunities, pooling savings, mobilization and exchange of goods and services for efficient utilization of resources and this influence trade flows and translates into growth.

References

- Aizenman, J., Jinjark, Y., & Park, D. (2011). International reserves and swap lines: Substitutes or complements? *International Review of Economics & Finance*, 20(1), 5–18.
- Aizenman, J., & Lee, J. (2008). Financial versus monetary mercantilism: long-run view of large international reserves hoarding. *World Economy*, 31(5), 593–611.
- Aizenman, J., & Pasricha, G. K. (2010). Selective swap arrangements and the global financial crisis: Analysis and interpretation. *International Review of Economics & Finance*, 19(3), 353–365.
- Arcand, J. L., Berkes, E., & Panizza, U. (2015). Too much finance? *Journal of Economic Growth*, 20(2), 105–148. <http://www.jstor.org/stable/44113443>
- Baltagi, B. H., Demetriades, P. O., & Law, S. H. (2009). Financial development and openness: Evidence from panel data. *Journal of Development Economics*, 89(2), 285–296.
- Becerra, O., Cavallo, E., & Scartascini, C. (2012). The politics of financial development: The role of interest groups and government capabilities. *Journal of Banking & Finance*, 36(3), 626–643.
- Beck, T. (2002). Financial development and international trade: Is there a link? *Journal of International Economics*, 57(1), 107–131.
- Beck, T., Demirgüç-Kunt, A., & Levine, R. (2010). Financial institutions and markets across

⁷ Moreover, several empirical and theoretical studies analyzed finance growth nexus and provided more supportive evidence. For example, the theoretical model in Blackburn and Hung (1998) also opines that trade liberalization and financial development foster economic growth.

- countries and over time: The updated financial development and structure database. *The World Bank Economic Review*, 24(1), 77–92.
- Bencivenga, V. R., & Smith, B. D. (1991). Financial intermediation and endogenous growth. *The Review of Economic Studies*, 58(2), 195–209.
- Blackburn, K., & Hung, V. T. Y. (1998). A theory of growth, financial development and trade. *Economica*, 65(257), 107–124.
- Braun, M., & Raddatz, C. E. (2005). *Trade liberalization and the politics of financial development* (Vol. 3517). World Bank Publications.
- Čihák, M., Demirgüç-Kunt, A., Feyen, E., & Levine, R. (2012). Benchmarking financial systems around the world. *World Bank Policy Research Working Paper*, 6175.
- Darrat, A. F., Elkhail, K., & McCallum, B. (2006). Finance and macroeconomic performance. Some evidence for emerging markets. *Emerging Markets Finance and Trade*, 42(3), 5–28.
- Demetriades, P., & Andrianova, S. (2004). Finance and growth: what we know and what we need to know. In *Financial development and economic growth: Explaining the links* (pp. 38–65). Springer.
- Demirgüç-Kunt, A., & Levine, R. (2009). Finance and inequality: Theory and evidence. *Annu. Rev. Financ. Econ.*, 1(1), 287–318.
- Destais, C. (2016). Central bank currency swaps and the international monetary system. *Emerging Markets Finance and Trade*, 52(10), 2253–2266.
- Do, Q.-T., & Levchenko, A. A. (2004). Trade and financial development. *Available at SSRN 610391*.
- Ductor, L., & Grechyna, D. (2015). Financial development, real sector, and economic growth. *International Review of Economics & Finance*, 37, 393–405.
- Fawzy, M., & Abd, T. (2021). *Currency SWAP Agreement with China : A new paradigm to penetrate the Markets*. 20(2), 267–279.
- Greenwood, J., & Jovanovic, B. (1990). Financial development, growth, and the distribution of income. *Journal of Political Economy*, 98(5, Part 1), 1076–1107.
- Guariglia, A., & Poncet, S. (2008). Could financial distortions be no impediment to economic growth after all? Evidence from China. *Journal of Comparative Economics*, 36(4), 633–657.
- Head, K., & Mayer, T. (2014). Gravity equations: Workhorse, toolkit, and cookbook. In *Handbook of international economics* (Vol. 4, pp. 131–195). Elsevier.
- Horn, S., Parks, B. C., Reinhart, C. M., & Trebesch, C. (2023). *China as an international lender of last resort*. National Bureau of Economic Research.
- Hussain, M., & Ahmed Mohammed, A. (2017). *Oil and Non-Oil Foreign Direct Investment and Economic Growth in Nigeria: An Empirical Evidence from Autoregressive Distributed Lag Model*.
- Jiang, L., Liu, S., & Zhang, G. (2023). The effect of bilateral currency swap agreements on foreign capital inflows: Evidence from China. *Southern Economic Journal*, 90(2), 444–473.
- Kiendrebeogo, Y. (2012). *The effects of financial development on trade performance and the role of institutions*.
- Kim, D.-H., Lin, S.-C., & Suen, Y.-B. (2010). Are financial development and trade openness complements or substitutes? *Southern Economic Journal*, 76(3), 827–845.
- Lai, E. L., & Yu, X. (2015). Invoicing currency in international trade: An empirical investigation and some implications for the renminbi. *The World Economy*, 38(1), 193–229.
- Levine, R. (1997). Financial development and economic growth: views and agenda. *Journal of Economic Literature*, 35(2), 688–726.

- Levine, R. (2003). More on finance and growth: more finance, more growth? *Review-Federal Reserve Bank of Saint Louis*, 85(4), 31–46.
- Levine, R. (2005). Finance and growth: theory and evidence. *Handbook of Economic Growth*, 1, 865–934.
- Liao, S., & McDowell, D. (2015). Redback rising: China's bilateral swap agreements and renminbi internationalization. *International Studies Quarterly*, 59(3), 401–422.
- Lin, Z., Zhan, W., & Cheung, Y. (2016). China's Bilateral Currency Swap Lines. *China & World Economy*, 24(6), 19–42.
- Lu, K., Wang, X., & Jin, L. (2023). The impact of China's bilateral currency swap agreements on bilateral direct investments. *Applied Economics*, 1–17.
- Manova, K. (2013). Credit constraints, heterogeneous firms, and international trade. *Review of Economic Studies*, 80(2), 711–744.
- Mati, S., Ismael, G. Y., Masoud, S., Hamad, K. Q., Mohammed, A. A., & Hussaini, M. (2024). Revisiting ECOWAS-Eurozone exports in the light of asymmetry. *Cogent Economics & Finance*, 12(1), 2309812.
- Menyah, K., Nazlioglu, S., & Wolde-Rufael, Y. (2014). Financial development, trade openness and economic growth in African countries: New insights from a panel causality approach. *Economic Modelling*, 37, 386–394.
- Mohammed, A. A. (2016). *Exchange Rate Pass Through into Consumer Price Inflation in Nigeria: An Empirical Investigation*.
- Mohammed, A. A. (2019a). *Central bank bilateral currency swap and trade flows: an implication for Renminbi internationalisation*.
- Mohammed, A. A. (2019b). *China's Bilateral Currency Swap Agreement: Strategic Move to Foster Political and Financial Hegemony*.
- Mohammed, A. A. (2019c). *China's Bilateral Currency Swap in International Trade Clearance: An Empirical Investigation*.
- Mohammed, A. A., Mati, S., & Hussaini, M. (2017). Exchange Rate Pass-Through Elasticity to Domestic Consumer Prices in Nigeria and Taylor's Hypothesis: A Structural Vector Auto Regression Analysis #. 7(5), 201–210. <https://doi.org/10.5923/j.economics.20170705.01>
- Niroomand, F., Hajilee, M., & Al Nasser, O. M. (2014). Financial market development and trade openness: Evidence from emerging economies. *Applied Economics*, 46(13), 1490–1498.
- Perez Saiz, H., & Zhang, L. (2023). *Renminbi Usage in Cross-Border Payments: Regional Patterns and the Role of Swaps Lines and Offshore Clearing Banks*.
- Rajan, R. G., & Zingales, L. (2003). The great reversals: the politics of financial development in the twentieth century. *Journal of Financial Economics*, 69(1), 5–50.
- Svirydzhenka, K. (2016). *Introducing a new broad-based index of financial development*. International Monetary Fund.
- World Bank. (2012). *Global financial development report 2013: Rethinking the role of the state in finance*. The World Bank.