Bilateral Currency Swap Agreements and International Trade -The Case of China-

Bilateral Currency Swap Agreements and International Trade: The Case of China

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Abstract

Together with its growing economic power and trade balance, a considerable number of studies have been conducted on the Chinese economy and its economic policies. Focusing on the financial aspect of international trade, trade finance in specific, this paper aims to address the relationship between currency swap agreements that China has signed and China's international trade with the currency swap counterparties. By employing a dataset that includes finance-related variables, this paper reports a strong and positive relationship between the currency swap agreements and China's bilateral import/export.

Keywords: International trade, Trade finance, Bilateral Currency Swap, RMB, China

1. Introduction

Payment and goods delivery in international trade go hand in hand. While the methods of cross-border transactions of goods have been sophisticated over time, so are the payment methods, trade finance in a specific term, related to international trade. The term trade finance generally refers to the payment methods, financial instruments and services that are designed to cover the risk related to the payment of international trade.

Trade finance plays a key role in international transactions for

mainly two reasons. Firstly, the transaction time of goods regarding international trade is generally longer than domestic transactions and this implies possible capital constraints for exporting companies. According to Djankov, Freund and Pham (2010), it takes 21 days on average for a good to be loaded on the ship from the factory that it was manufactured and 23 days on average for the same good to be stored in the warehouse of the importing company. Regarding the transportation time, Hummels and Schaur (2013) reports 20 days on average for maritime transportation to the U.S. Above numbers give a 2-month period between the time the good leaves the manufacture's factory and reaches the importer's warehouse. On top of that, there are also countries that provide a 90-day moratorium for the payment of international transactions. All in all, an exporter might have to wait more than 3 months in maximum to receive the payment of the transaction conducted and this poses a significant risk on cash management of exporters if the transaction is conducted without any risk covering measure. While exporters wish to receive payment as early as possible to avoid the risk of capital constraint, importers might wish to delay the payment as much as possible so they can confirm the merchandise and also optimize their cash management.

Another reason to emphasizes the importance of trade finance is the unique risk associated with international transactions. Table 1 summarizes the main risk categories regarding international trade. Economic risk in table 1 might not look unique to international trade but considering the fact that transactions are conducted cross-border, jurisdiction issues arise and that is a unique factor of this risk category related to international transactions. Political risk is another category that also applies to the domestic transaction (especially domestic policy) but again considering a cross-border transaction, policies of both the host and the destination countries are involved and that is a unique combination only in the case of international trade. Transportation risk also does apply to domestic trade, but the risk is higher considering longer transportation time in cross-border transaction.[1]

Table 1 Major risk categories associated with international trade

Economic Risk		Importer is not willing or unable to pay Importer does not accept merchadise Exporter does not deliver on time or products agreed
FX risk		Variations in exchange rate Risk of devaluation
Trasportation risk		Damage of goods Loss of goods
Political risk	Foreign policy	War Embargo Restrictions
	Domestic policy	Revolt Civil war
	Economic policy	Prohibition to transfer foreign exchange Currency declared non covertable

Source: WTO (1995)

Trade finance consists of the measures that are designed to mitigating the risk associated with international trade and smoothing the transactions between parties that have opposite interests regarding the payment. Thus, the importance of trade finance in the process of international trade is undeniable. Assmundson et al. (2011) and BIS (2014) estimated approximately 35–40% of global trade was covered by bank-provided trade finance in 2008 and 2011 respectively, and Auboin (2009) concluded that 80–90% of global trade involves some form of trade finance. However, despite its' importance, trade finance has not been receiving enough attention in the field of international economics. The theoretical development of trade finance study is still in its very early stage and it is hard to say that we have a well-established model for comprehensive analysis. On the empirical side, the development of studies is seriously constraint by the data availability.[2]

This study aims to provide new evidence on a different aspect of trade finance by focusing on bilateral currency swap agreements that China has signed and their impact on international trade. There are mainly two reasons that this paper focuses on the currency swap

agreements of China. Firstly, one of the largest demands for foreign currency rises from international trade settlement. When international trade settlement can be conducted with the legal currency of trading counterpart, the existence of currency swap agreements could stimulate bilateral trade since it could serve as the last resort of liquidity provision. Although the legal currency of trading counterpart might not be one of the so-called major currencies such as the U.S. dollar or Euro, the scarcity of liquidity could still harm international trade in terms of settlement and trade finance. Under such a situation, if a currency swap agreement that provides additional liquidity is in place with the counterpart, it could help to buffer the negative impact on international trade through securing the trade settlement and trade finance. Analysis in this paper is designed to test this rationale.

The second reason to focus on currency swap agreements of China is its policy toward Renminbi (RMB going forward) internationalization. Nominally, China has the second-biggest economy and the largest trade volume in the global economy. Since 2009, China has aggressively put forward a series of policies to internationalize its currency. The series of policies include currency swap agreements, RMB trade settlement which also led to RMB offshore market and RQFII scheme. While strict capital controls are still in place, China has gradually implemented policies that are designed to foster the use of RMB among foreign enterprises and investors. This series of policies provide great opportunities to assess their impact on China's international trade and investment, and combined with the first reason mentioned above, it also provides an opportunity to investigate the importance of trade finance.

The rest of the paper is structured as follows: section 2 provides a brief review of the existing literature on trade finance. Section 3 goes through estimation strategy, data, estimation results and discussion. Section 4 concludes the paper.

2. Literature review

The theoretical framework of trade finance is motivated by questions such as why exporters would decide to utilize trade finance and what are the factors that affect this decision. The general answer is, as explained earlier, to mitigate the risk associated with international trade compared to domestic sales. Glady and Potin (2011) and Schmidt-Eisenlohr (2013) developed payment choice models to explain the rationale behind the usage of trade finance and the spirit is also followed in Antras and Foley (2015) by including contract enforcement in their model. Hoefele, Schmidt-Eisenlohr and Yu (2016) has extended the model in Schmidt-Eisenlohr (2013) by introducing product complexity while different approaches were adopted in Ahn (2015) and Olsen (2016). Ahn (2015) provided insights by solving optimization problems of parties involved in trade utilizing different types of trade finance and Olsen (2016) focused on the idea of relationship building.

Most of the theoretical insights share a few points in common. First, law and contract enforceability are addressed to be crucial. Intuitively, the possibility that the contract will be honored is one of the central interests of export/importing firms. Asymmetric information is another aspect that justifies the usage of bank trade finance as the financial institutions might have better information on the creditworthiness of counterparties. Finally, the relationship between trading partners is also referred to as a important point in relation to asymmetric information.

Empirical studies of trade finance can be categorized into 3 groups as per motivation and data usage; research with direct trade finance data, research with indirect proxy data of trade finance including trade credit, insurances and guarantees, and research focusing on general financial constraints. I will review the third category in light of the research conducted in this paper focusing on bilateral currency swap agreements.[3]

Chor and Manova (2012) measured the risk environment and its impact on trade utilizing inter-bank offer rate since a major part of the global trade is covered by bank-provided trade finance. In the same line of approach, Amiti and Weistein (2011) and Coulibaly, Sapriza and Zlate (2011) have focused on the health of financial institutions and non-financial firms respectively. In addition to trade credit data, Love, Preve and Sarria-Allende (2007) also included financial soundness focusing aftermath of major currency fluctuations in Latin America and Asia. Some other studies with regional focus are Berman and Martin (2012), Bricongne et al. (2012) and Jarreau and Poncet (2014) that focused on sub-Saharan Africa, France and China respectively. Manova (2008) extended the research to equity market liberalization and its impact on international trade while Ahn, Amiti and Weistein (2011) have argued on a more fundamental factor that makes trade finance essential to international trade, the distance.

To summarize, there are three points that all of these studies share in common as the conclusion. First, they all stress the importance of trade finance with clear supportive evidence that suggests strong and significant explanatory power over trade flow. Secondly, the impact of trade finance is significantly magnified during crisis periods. Thirdly, all research suggested that financial condition is one of the main determinants of trade finance supply as well as the demand and external finance reliance as a key industry characteristic when considering trade finance.

Regarding specifically currency swap agreements, Zhang et al. (2017) provides an analysis of China's currency swap agreements and bilateral trade. They report that the negotiations of the currency swap agreements increase the bilateral trade volume of China with its trading partners. While this paper also observes similar results, it stands in a different position from Zhang et al. (2017) via two points. Firstly, the motivation of Zhang et al. (2017)'s analysis lies in economic integration, especially considering that a part of the analysis is focused on bilateral trade between China and trading partners involved in Belt and Road

Initiatives. This paper, however, sees the currency swap agreement as a proxy of trade finance provision. The interpretation of the estimation results and rationale behind it are completely different. Secondly, and more importantly, this study applies a different set of variables that are not considered in Zhang et al. (2017). While Zhang et al. (2017) focused on economic integration and bilateral trade, the study adopted gravity type of estimation to examine the impact of the currency swap agreements. On the other hand, as this study has its motivation on trade finance and financial aspect of international trade, it employs a different set of variables that to be explained in detail later.

3. Currency swap agreements

A currency swap agreement is a bilateral agreement between central banks to exchange currencies. The agreement allows central banks to obtain liquidity of foreign currencies from the banks that issue them. In recent years, currency swap agreements are mostly used to stabilize the financial market, especially the funding market of foreign currencies. For example, under an extremely high-risk situation such as a financial crisis, financial institutions would simultaneously run for liquidity of currencies that their assets are tied to. This herd behavior would drive up the cost in the funding market and lead to a liquidity crunch as the private financial institutions do not have direct access to liquidity provided by foreign central banks. In such case, the home central bank would be able to inject currency liquidity into the market by utilizing the currency swap agreements thus maintaining the stability of the financial market and controlling the damage to its' minimum.

Although there are funding markets for almost every currency, the demand for one currency is different from another. This is quite intuitive and realistic considering the denominated currency of assets and usability of certain currencies such as the U.S. dollar, Euro and Japanese Yen. In 2011, the Federal Reserve together with the European

Central Bank, Bank of Canada, Bank of Japan, Bank of England and Swiss National Bank formed a network of currency swap agreements enabling participants to obtain currencies from each other. This is a currency swap network of some of the world's most dominant currencies and it as well highlighted the systemic importance of the currencies of these nations. For the same reason, more and more countries are signing currency swap agreements with China. From both a trade and investment perspective, countries in Southeast Asia, Central Asia, Africa and Europe are becoming more and more involved with the second-largest economy in the world. Investment flowing into China now can be denominated in RMB and China is also investing in foreign countries in its' currency.[4] International trade settlement can also be conducted with RMB and the usage of RMB in trade settlement is showing rapid growth.[5] Considering all these involvement and systemic connection with China, it is quite natural that numbers of countries are keen to sign currency swap agreements with China to secure liquidity for its' home funding market.

From the trade finance-related perspective, the growing number of bilateral currency swap agreements with China gives rise to one question. Once the currency swap is agreed upon and the central banks are ready to provide liquidity in case of emergency, does it stimulate trade between two countries? When conducting cross-border trade with other countries, one of the critical elements to consider is the payment and the currency involved. Even though the currency required for the payment depends on the contract agreed by exporters and importers, it is important that there is enough liquidity in the funding market of the payment currency and generally, it is obvious that lower funding cost of the payment currency is in favor of the importers and benefits exporters as well. Since the funding cost reflects the liquidity, deeper liquidity of certain currency in the funding market drives down funding cost thus making the currency more attractive as a payment/settlement currency.

The hypothesis to be tested here is based on the above argument.

As China signs currency swap agreements with other countries, it works as a strong safety measure to secure RMB liquidity in the destination country especially in the time of emergency. This would drive down the funding cost of RMB at the destination market thus making RMB easier to obtain as payment/settlement currency when trading with Chinese firms. From the finance perspective of cross-border trade, this could stimulate bilateral trade between China and the destination country. While the estimation will not be conducted explicitly to support this rationale step by step, the idea is to take the currency swap agreements as a general indicator of an increase in the liquidity of a currency in the destination market and to document the impact of the agreements on bilateral trade. In addition, the result will not only be supportive evidence for the above hypothesis but also would be strong evidence for emphasizing the importance of the financial perspective of international trade.

3.1 Data and description

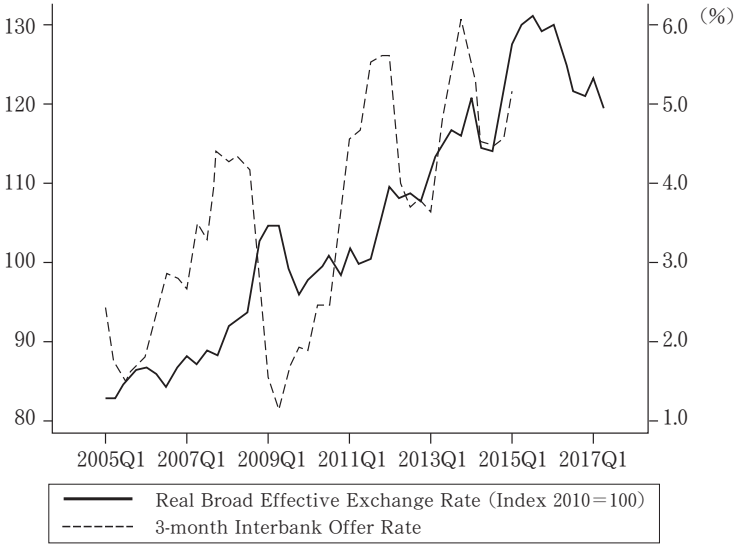
Trade data between China and other countries is obtained from International Trade Center on a quarterly basis at HS 2-digit level. It covers 36 countries that China has signed currency swap agreements and the time range is from 2005 to the 3rd quarter of 2015. China's GDP, the real broad effective exchange rate of RMB and the 3-month interbank offer rate of China are obtained from the Federal Reserve Bank of St. Louis. The real broad effective exchange rate is an index that has 2010 as the base year of 100. The index is available on monthly basis and has been converted into a quarterly basis by simple average. The detail of currency swap agreements between the People's Bank of China and its' counterparties are obtained from RMB Internationalization Report 2017. Starting from its' very first agreement with Hong Kong, as of the end of 2015, China has signed currency swap agreements with 36 countries.[6] These currency swap agreements all started with expiration periods but are all either extended or renewed.

Figure 1 shows the change in China's GDP and its' trade with 36

countries that it has signed currency swap agreements. Both trade and GDP are in a growing trend in general from 2005 to 2013 except the sharp decline in 2008–09 due to the global financial crisis. The growing trend of GDP started to slow down around 2011–12 and the economy begin to enter the phase of "new normal" as the Chinese government claimed. The same trend applies to trade as we can see both import and export are growing at a slower pace since 2011–12. Figure 2 is the change in the 3-month interbank offer rate and broad real effective exchange in China. Again, we can see a rise and fall in interbank rate around 2008–09 and a general appreciation trend in the real broad effective exchange rate. Among the three explanatory variables to be included in the estimation, GDP and exchange rate are generally considered to have a large effect on a country's international trade. For including the interbank rate, it is supported by several empirical studies from the financial perspective of trade. Chor & Manova (2012) focused on interbank offer rate as an indicator of general credit condition to

Source: International Trade Center, Federal Reserve Bank of St. Louis.

Figure 1　Change in import/export from/to 36 countries and China's GDP



Source: Federal Reserve Bank of St. Louis.

Figure 2 Change in China's 3-month interbank offer rate and real broad effective exchange rate

estimate the impact of trade finance on export. The rationale behind it is that the trade finance can be considered as a form of short-term loan and the interbank rate would be the benchmark for the cost of utilizing such loans. The estimation result supported their hypothesis that the interbank offer rate does affect export of the U.S. and Nuermaimaiti (2017) has documented similar result focusing on Japanese export. By following these researches, the interbank offer rate would be included in the analysis to control the effect of interest rate, trade finance measures and loans related to it.

3.2 Estimation and results

3.2.1 Strategy and specification

The estimation strategy follows Manova (2008) by conducting panel estimation that divides data into before and after the introduction of currency swap agreements by applying dummy variables. The

analysis is conducted by estimating the below specification via GLS:

$$Y_{it} = \beta_0 + \beta_1 SWAP_{it} + \beta_2 CHGDP_t + \beta_3 CHFX_t + \beta_4 IB_t + \epsilon_{it} \quad (1)$$

where Y_{it} is the log value of the trade between China and country i at time t. $SWAP_{it}$ is a dummy variable that takes 1 for country i at the quarter and the quarters after the introduction of currency swap agreements with China and 0 for previous quarters. $CHGDP_t$, IB_t and $CHFX_t$ are the log value of GDP, 3-month interbank offer rate and real broad effective exchange rate of China at time t respectively. β_0 and ϵ_{it} each represents constant term and residual. Coefficient β_2 of China's GDP is expected to be positive as intuitively the growth in the economy will drive the trade as well. For coefficients β_3 and β_4, the signs are expected to be negative except for β_3 in import. An increase in the real broad effective exchange rate means appreciation of the currency and in general terms, this would be a factor to decrease export as the counterparties would be facing higher prices than before. On the opposite, currency appreciation would benefit imports as, in general, it means a relatively lower price for importers. In the case of the interbank rate, higher rate means higher cost of loans and financial products. The higher cost for general and trade-related financial loans and products is expected to negatively affect both import and export. However, the focus of this analysis is on the coefficient β_1 of currency swap dummy and a positive sign is expected from the hypothesis explained in the previous section. As the safety measure has been established for RMB to secure its' liquidity in the destination market, this would work as a positive impact on overall trade with China.

3.2.2 Estimation results and discussion

Regression results from Eq. (1) are presented in table 2 and coefficients in focus are highlighted in bold. For all three estimations, the coefficients of the currency swap agreement are estimated to be positive and statistically significant. These results strongly support the

hypothesis that the introduction of currency swap agreements had a positive impact on trade between China and its' 36 counterparties. The effect of China's GDP to trade is estimated to be positive as predicted at 1% significance while the interbank rate is estimated to have a negative impact to trade as expected but not statistically significant. The results for the exchange rate are somehow partly different from expectations. Regression on China's export generated highly significant results with the expected sign but the import side of estimation gave a negative sign which is counterintuitive. However, this counterintuitive result is in line with Marquez and Schindler (2007). They have constructed an empirical model of China's import and export share over the world including real income, real exchange rate and foreign direct investment. By regressing these three factors to ordinary products, parts and components, they have documented that appreciation of RMB resulted in a decline in import share. One of the two possible explanations is the existence of large state-owned enterprises. Even though these enterprises are also heavily engaged in import, the usual effects of exchange

Table 2 Panel estimation on trade between China and currency swap partners

	Export to 36 countries	Import from 36 countries	Total trade with 36 countries
SWAP	**0.722*****	**0.681*****	**0.533*****
	(0.0706)	(0.102)	(0.0798)
CHGDP	1.370***	1.605***	1.412***
	(0.190)	(0.251)	(0.204)
CHFX	−0.0229***	−0.0139**	−0.0169***
	(0.00468)	(0.00643)	(0.00518)
IB	−0.0271	−0.0627	−0.0329
	(0.0294)	(0.0394)	(0.0317)
Constant	−10.84***	−16.86***	−11.60***
	(3.317)	(4.397)	(3.560)
Observations	1,468	1,468	1,468
Number of ID	36	36	36

Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

rate movement do not impact their behavior thus could possibly generate the estimated outcome. Secondly, if the domestic products are not a good substitute for imports, the decreasing effect of currency appreciation might be offset by the still-strong demand for imported products. Overall, the result of empirical analysis on currency swap agreements has suggested that China and its' trading partners have enjoyed the benefit of currency swap agreements from a trade perspective even including other factors into the estimation. These results not only support the hypothesis posed earlier but also add new evidence on proving the importance of the financial aspect of international trade.

4. Conclusion

This paper focused on the relationship between China's bilateral currency swap agreements and its bilateral trade with 36 counterpart countries. The analysis is motivated by providing new evidence related to the financial aspect of international trade, especially trade finance. By utilizing the dataset of bilateral currency swap agreements and bilateral trade with 36 countries, estimations were conducted to test the hypothesis that signing bilateral currency swap agreements has a positive impact on bilateral trade. The estimation results supported this hypothesis for both import and export with strong statistical significance. What makes these results unique from similar studies is the finance-related motivation and dataset. The study can surely be extended to multiple directions. The study in this paper did not specify the transmission channel of bilateral currency swap agreements to bilateral trade. One possible extension would be including specific variables such as market thickness or liquidity of RMB to pin down the channel of transmission. Cross-country analysis would be another possible future study. Including bilateral currency swap agreements that are signed not only by China but also other nations would also provide more comprehensive insights.

Notes

1 It is possible to have a case that domestic transportation takes longer than cross-border transportation but taking all the due procedure of international trade into consideration, it is not unrealistic to assume longer transportation time for international trade.
2 For detailed review of literature, see Comtessi and de Nicola (2012), Foley and Manova (2015), Vaubourg (2016) and Nuermaimaiti (2018b).
3 Nuermaimaiti (2018b) provides detailed review on empirical studies related to trade finance.
4 China introduced RQFII scheme in late 2011 so the foreign investors can invest in certain asset class in mainland China that are approved by China Securities Regulatory Commission via RMB.
5 Alice Ross, "Banks Report Growth in Trade in Renminbi", Financial Times, October 16, 2012 (Online edition).
6 In alphabetical order, they are Albania, Argentina, Armenia, Australia, Belarus, Brazil, Canada, Chile, European Union (ECB), Hungry, Iceland, Indonesia, Kazakhstan, Korea, Malaysia, Mongolia, Morocco, Nepal, New Zealand, Pakistan, Qatar, Russia, Serbia, Singapore, South Africa, Sri Lanka, Surinam, Switzerland, Tajikistan, Thailand, Turkey, United Arab Emirates, United Kingdom, Ukraine and Uzbekistan.

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