Real Exchange Rate and Services Export Diversification

Sèna Kimm Gnangnon (kgnangnon@yahoo.fr)
World Trade Organization

Research Article

Keywords: Real Effective Exchange Rate, Services Export Diversification

Posted Date: March 1st, 2021

DOI: https://doi.org/10.21203/rs.3.rs-288601/v1

Real Exchange Rate and Services Export Diversification

Author: Sèna Kimm GNANGNON[1]

Manuscript date: March 2021

Abstract

The relationship between real exchange rate and services export diversification is at the heart of this study. The analysis is performed using a sample of 125 countries over the period 1985-2014, and the two-step system Generalized Methods of Moments (GMM) approach. It shows that for both high income countries and developing countries, real exchange rate depreciations promote services export diversification and increase the total number of services export lines. These findings highlight the strong importance of real exchange policies in promoting services export diversification in high-income countries and developing countries alike.

Keywords: Real Effective Exchange Rate; Services Export Diversification.
JEL Classification: O14; O24.

Affiliation: World Trade Organization
Postal Address: Rue de Lausanne 154, CH-1211 Geneva 21, Switzerland.
E-mail: kgnangnon@yahoo.fr

DISCLAIMER

This is a working paper, which represents the personal opinions of individual staff members and is not meant to represent the position or opinions of the WTO or its Members, nor the official position of any staff members. Any errors or omissions are the fault of the author. The author declares no competing interests.

[1] World Trade Organization (WTO). E-mail for correspondence: kgnangnon@yahoo.fr

1. Introduction

The literature has now established that exchange rate policies play a critical role on countries' export performance, including their manufacturing export performance (e.g., Elbadawi, 2002; Grobar, 1993; Fung and Liu, 2009; Hunegnaw, 2017; Mao et al., 2019; Nouira et al., 2011; Sekkat and Varoudakis, 2000) and export product diversification (e.g., e.g., Agosin et al., 2012; Kwasi, 2018; Tran et al., 2017; Sekkat, 2016). Having been neglected for several decades and considered as a residual sector of the economy, the services sector has recently gained a strong attention of policymakers, researchers and scholars, in part due to the globalization and the rapid development of tools of information and communication technologies. Specifically, recent years have witnessed a growing interest on the factors underpinning the development of trade in services, and particularly services exports. Some of the studies on the determinants of services exports have looked at the relationship between the real exchange rate and services exports, and reported that an appreciation of the exchange rate influences negatively services exports, and even more than goods exports, including manufacturing exports (e.g., Abeysinghe and Yeok, 1998; Baggs et al. 2010; Eichengreen and Gupta, 2013; Fung, 2008; Smith, 2004). At the same time, some few studies (e.g., Agosin et al., 2012; Kwasi, 2018; Tran et al., 2017; Sekkat, 2016) concerning the effect of exchange rate policies on export product diversification and provided empirical evidence that exchange rate appreciations prevent countries, including developing ones from diversifying their export product baskets. However, to the best of our knowledge, little attention has been paid to the relationship between the exchange rate and services export diversification. In fact, we are no aware of any empirical analyses on this topic, let alone any study on the determinants of services export diversification. The current paper aims to fill this gap in the literature by investigating empirically the effect of the real exchange rate on services export diversification.

The growing importance of the services sector for countries' participation in international trade and more generally for their economic growth and development has been underlined by many recent studies (e.g., Adlung, 2007; Anand et al. 2012; Fiorini, and Hoekman, 2018; François and Hoekman, 2010; Hoekman, 2017; Hoekman and Mattoo, 2008; Hoekman and Shepherd, 2017; Lanz and Maurer, 2015). The increasing importance that international organizations have been attaching to the services sector is epitomized by the fact that the World Trade Organization (WTO) has devoted its 2019 trade report (WTO, 2019) to the issue of trade in services. The report entitled "The future of services trade" aims to contribute to deepening the understanding on trade in services. It uses new trade in services data to present the current landscape on trade in services as well as how it will evolve in the near future, particularly in light of the rapid development of technologies that facilitate the tradability of services. In the same spirit, the current article also aims to help better understand the underlying factors of services exports, in particular services export diversification, including by focusing on how real exchange rate influences services export diversification. The empirical analysis covers 125 countries over the period 1985-2014, and reveals that real effective exchange rate depreciations strongly promote services export diversification both in high income countries as well as in developing countries.

The rest of the article is organized as follows. Section 2 discusses the avenues through which real exchange rate could influence services export diversification. Section 3 presents the model specification and the econometric methodology for the empirical analysis. Section 4 discusses empirical results, and Section 5 concludes.

2. Theoretical motivation - discussion on the effect of the real exchange rate on services export diversification

At the outset, we would like to note that the effect of real exchange rate on services export diversification would take place through its effects on services export volumes. If movements of real exchange rate induce a rise in export of existing services 'products' (i.e., a rise in services exports at the intensive margins), then they would be associated with services export concentration. In contrast, if these real exchange movements promote the development of new services export 'products' (i.e., a rise in services exports at the extensive margins), then they would induce services export diversification.

The conventional literature (e.g. Guzman et al., 2018; Freund and Pierola, 2012; Nouira et al., 2011; Rodrik, 2008, 2009) has usually argued that a competitive and a stable real exchange rate should be part of the portfolio of instruments aiming at diversification production and exports, and promoting macroeconomic stability and development. Further to an appreciation of the home currency, the increased competition faced by domestic firms in both domestic and foreign markets could lead some firms (notably those with a relatively high productivity) to reduce their mark-up so as to maintain their competitiveness. This aligns with the argument of many economists that in general, exports depend in varying degrees on imported raw materials and imported intermediate inputs (e.g., Abeysinghe and Yeok, 1998; Athukorala, 1991; Athukorala and Menon, 1994), so that when exporters face an appreciation of the currency, they reduce their profit mark-up so as to maintain in varying degrees their competitiveness in world markets. The prices decline associated with the increased competition could induce lower profits for less productive firms that could exit the international markets (e.g., Baggs et al., 2010; Fung, 2008; Melitz and Ottaviano, 2008). Baldwin and Krugman (1989) have underscored that there are significant implications of exchange rate movements for firms' entry and exit. Melitz (2003) has suggested that a depreciation of the home currency should increase the rate of new exporters' entry into the market only when the fixed entry costs are low, because if expected gains in the international market are lower than fixed entry costs, firms would opt for staying out of the international markets. Furthermore, authors such as Baggs et al. (2010) and Fung (2008) have shown that an appreciation of the home currency could have two opposing effects on the domestic firms' sales in both the domestic and international markets. On the one hand, some firms could exit the market because of a substantial decline of their profits, and hence provide surviving firms in the market with a higher market share. As a result, the effect of the home currency appreciation on the survival of domestic firms depends on the direction and the relative magnitude of the changes in exports (and domestic sales): the lower the firms' exit rate (or the smaller the number of exiting firms compared to the incumbent firms), the higher is the magnitude of the expected adverse effect of the home currency appreciation on surviving firms' sales. On the other hand, the appreciation of the domestic currency could be associated with higher sales of surviving firms in the context of high exit rates or large number of exiting firms, and where market share gains of surviving firms (due to the death of some firms) exceed the fall in sales induced by the enhanced competition associated with the appreciation of the domestic currency (see Baggs et al., 2010). *The lines of arguments developed above show that real exchange rate appreciation could positively or negatively influence services export volumes and hence be positively associated either with services export concentration or services export diversification.*

On the other hand, Guzman et al. (2018) have stressed that a competitive real exchange rate is desirable only under specific conditions. Specifically, the authors have demonstrated theoretically two conditions under which a competitive real exchange rate is a constrained optimal policy. The first condition refers to the situation where there are no constraints on subsidies to the tradable sector. In such a case, optimal intervention entails the appreciations of the real exchange rate. This involves for the government to identify the learning spillovers related to each type of activity and to use subsidies (financed by lump-sum taxes) and transfers to promote the production and exports of the tradable products that features learning spillovers. This first best policy response would require an appreciation of the real exchange rate (see also Itskhoki and Moll, 2014). The second condition refers to the situation where the use of subsidies is constrained by international agreements (as it is the case for goods in the Agreement on Subsidies and Countervailing Measures of the World Trade Organization – WTO). Under this condition, the optimal policy entails a depreciation of the real exchange rate and the implementation of a set of taxes on tradable products that have a low or no learning benefits. Such an approach involves the creation of a system of multiple exchange rates. As subsidies in favour of export services are for the time being not disciplined in WTO Agreements (see for example, Grosso, 2008), countries, including developing ones could use them to stimulate the production and exports of services that feature learning spillovers (this particularly the case for modern services). According to Grosso (2008), export subsidies for services have been used by many developed and developing countries to support a wide range of services sectors. *In this case, an appreciation of the real exchange rate would be the best policy option, as it could expand services exports through the development of new services export 'products' (and hence lead to services export diversification) or through the expansion of production or exports of exiting services products (this would be associated with the rise in the degree of services exports concentration).*

Another strand of the literature has also argued that the net effect of a domestic currency depreciation (or devaluation) on the tradable sector (and eventually on export diversification) would depend on the balance between contrasting effects (e.g., Ramzi, 2013; Wondemu and Potts, 2016). On the one hand, as noted above a domestic currency depreciation (or devaluation) could result in higher profitability of the tradable sector, investment, employment and export diversification that involves new tradable products (including services). On the other hand, a domestic currency depreciation could also lead to higher real wages (induced by the rise in employment in the tradable sector), which could counteract its expected expansionary effect on the tradable sector (including both goods and services). At the same time, the expected expansionary effect could dominate the negative real wages effects if the profits in the tradable sector induced by the depreciation of the domestic currency translates into higher accumulation of capital and learning and hence technological progress. Furthermore, the inflationary effects of a depreciation of the home currency could reduce the resources available for domestic investment, which lowers (increases) the possibilities for firms as well as for the government to invest in the strengthening of productive capacities and the supply capacity of the economy. Guzman et al. (2018) have noted the existence of some trade-offs in the implementation of competitive real exchange rate policies. This is because while a more depreciated exchange rate induces higher costs of imported inputs and capital goods (although Baumol, 2017 has indicated that import share could rise after a devaluation), the rise in the domestic content of the production of tradable goods would help improve the profitability of the tradable sector in the context of a real exchange rate depreciation. Furthermore, as the development of sectors may require a long time for firms to

learn so as to become competitive internationally, the costs of learning will increase with a more depreciated real exchange rate if learning entails imported inputs (Guzman et al. 2018: p55). To some extent, similar views have been shared by Abeysinghe and Yeok (1998) who have noted that under certain circumstances (or a combination of circumstances), exports volumes could increase in the context of currency appreciation. This is the case if (i) the import content of exports is relatively large, which significantly reduces the negative effect of the currency appreciation on exports. In fact, export and import prices become closer as the import content of exports rises (or when domestic value added of exports is low), which lowers the negative effect of currency appreciation on exports. This means that as services have a relatively lower content of imported inputs than goods, including manufacturing products, they could be more affected by a currency appreciation than goods would be; (ii) external demand has been on rise as it could mitigate and even more than compensate the negative effect on services exports volumes of the currency appreciation. (iii) productivity increases (a rise in productivity could counteract the adverse effects on services export volumes of a currency appreciation); and (iv) pricing-to-market policies counter the adverse effects of currency appreciation. *Once again, these lines of arguments do not allow us to anticipate theoretically whether a real exchange rate appreciation (or depreciation) would lead to higher (or lower volumes) whether this would hence translate into higher level of services export concentration or greater services export diversification.*

The few existing studies on the services exports effects of the real effective exchange rate tends to report a negative effect of real exchange rate on services exports. For example, Smith (2004) has obtained that different export sectors respond differently to the same exchange rate movements. In particular, they have uncovered that the volumes of services exports (which include tourism) are more sensitive to exchange rate movements than export volumes from the agricultural sector. Sahoo and Dash (2014) have found a long-run negative effect of real exchange rate appreciations on modern services exports in India. Baggs et al. (2010) have examined the effect of the appreciation of the Canadian dollar on the probability of survival, sales, and profitability of Canadian firms. They have found evidence that real appreciations (depreciations) of the Canadian dollar reduce (increase) firms' probability of survival, sales, and profitability. Furthermore, their study has shown that while the magnitude of exchange on firms' sales is the same for both services and manufacturing firms, the magnitude of the profits effects of the exchange rate is higher for manufacturing firms. The effect of the exchange rate appreciation on the probability of firms to survive is larger among services firms. Eichengreen and Gupta (2013) have found empirical evidence that real exchange rate appreciations influence negatively and significantly both services and merchandise exports, but the negative effect is more pronounced for services exports, notably modern services exports than for merchandise exports. These effects apply to developing countries and developed countries alike in their full sample of 66 countries. The authors have proposed several explanations for the differences in services exports and merchandise exports responses to the real exchange rate appreciations. These include the eventual fewer imported inputs content of services exports, the possible lower fixed costs of entry into the services sectors and the possible high elasticity price of the demand for services exports. The empirical findings of Abeysinghe and Yeok (1998) are in line with those of Eichengreen and Gupta (2013). These authors have obtained for Singapore that because of their very low import content, services exports have suffered from currency appreciation, including more than merchandise exports. Based on these arguments, *one could argue that real exchange rate depreciations would be associated with higher services exports, which could*

translate into a higher services export concentration or greater services export diversification. However, even though real exchange rate appreciations induce higher negative effects on services exports (notably modern services exports) than on merchandise exports, it is still possible that firms (including the less productive ones) that face lower entry costs into the services (modern services) sectors compared to the merchandise sectors, they may decide to shift their resources to the services sector, and invest either in new services activities (which would lead to services export diversification) or on existing services activities in which the country enjoys a comparative advantage in the international market (this would generate greater services export concentration). In addition, in the context of real exchange appreciations, new firms that aim to invest in the tradable sector might opt for entering into the services sector (given the relatively lower entry costs in this sector) and invest on existing activities or on new services export activities. The rationale for this reasoning lies on the findings by Baggs et al. (2010) that firms' probability of surviving after real appreciations of the domestic currency is higher among services firms than among firms operating in the merchandise sectors. Even surviving firms in the services sectors that reduce their mark-up so as to maintain their competitiveness in the context of real exchange rate appreciations (Abeysinghe and Yeok, 1998; Athukorala, 1991; Athukorala and Menon, 1994; Baggs et al. 2010) might decide to explore new services export items so as to regain a higher level of competitiveness in the international trade markets. In this case, real exchange rate appreciations would be associated with greater services export diversification. *The argument for a positive effect of real exchange rate appreciations on services export diversification also holds if as noted by Abeysinghe and Yeok (1998), in the context of such exchange rate appreciations, the import inputs content of services export increases; the external demand increases; productivity improves, and firms adopt pricing-to-market policies counter the adverse effects of currency appreciation.*

In light of the review documented above, it is difficult to anticipate from a theoretically perspective the direction in which the real exchange rate appreciation (or depreciation) would influence services export diversification.

3. Model specification and econometric strategy

3.1 Model specification

The literature has not yet provided a unified theoretical framework on the determinants of services export diversification. However, a number of studies (e.g., Kimura and Lee, 2006; Nyahoho, 2010; van der Marel, 2012) have shown that the international trade theory that applies to trade in goods could also apply to trade in services. This has led the studies on the determinants of services exports to drawn on the literature on the determinants of goods exports. In light of this, the current study relies on existing empirical studies on the determinants of export product diversification (e.g., Adityaa and Acharyya, 2015; Agosin et al., 2012; Amighini and Sanfilipo, 2014; Zhu and Fu, 2013; Gnangnon, 2019a, 2019b; Gnangnon and Roberts, 2017; Hausmann et al., 2007; Kim, 2019; Osakwe et al., 2018; Parteka and Tamberi, 2013; and Zhu and Fu, 2013) and to some extent on Anand et al. (2012) to investigate how development influences services export diversification and to what extent the real exchange rate matters for this relationship. Thus, we postulate the following model specification:

$$SEC_{it} = \beta_0 + \beta_1 SEC_{it-1} + \beta_3 Log(REER)_{it} + \beta_4 Log(GDPC)_{it} + \beta_5 TRPOL_{it} + \beta_6 EDU_{it} + \beta_7 FINDEV_{it} + \beta_8 POLITY2_{it} + \beta_9 Log(POP)_{it} + \mu_i + \lambda_t + \omega_{it} \quad (1)$$

where the subscript i represents a country recipient of given country, and t indicates the time-period. The unbalanced panel dataset covers 125 countries and the period 1985-2014, based on data availability. The analysis has used two sub-samples, namely High-Income Countries[2] (HICs) and other countries in the full sample (denoted "NonHICs"), which we could also refer to as "Developing countries". The sample contains 36 countries classified as HICs and 89 developing countries. The effect of business cycles on variables has been smoothed out by using non-overlapping sub-periods of 5-year average data, i.e., the sub-periods 1985-1989; 1990-1994; 1995-1999; 2000-2004; 2005-2009; and 2010-2014. β_0 to β_8 are parameters to be estimated. μ_i represent countries' fixed effects (unobservable time invariant characteristics that could influence services export diversification path); ε_{it} is a well-behaving error-term. λ_t are time dummies that represent global shocks affecting together all countries' services export diversification path. The description and source of variables included in model (1) are provided in Appendix 1. Appendix 2 shows descriptive statistics on these variables and Appendix 3 presents the list of countries used in the analysis.

The dependent variable "SEC" is the measure of the level of services export concentration. The latter is measured using three indicators drawn from the empirical work on the determinants of export product diversification (e.g., Agosin et al., 2012; Cadot et al., 2011). The first indicator is the Herfindahl index (also referred sometimes to the Hirschman-Herfindahl index), which is the most commonly used indicator for measuring concentration. The computed Hirschman-Herfindahl index of services export concentration is denoted "HHI". The second index of services export concentration is the Theil index, which is denoted "THEIL". The third indicator used in the analysis is the total number of services export lines (denoted "LINES").

The HHI indicator has been computed as the sum of the squared shares of each export line k (with amount exported) in total services exports, using the formula: $HHI = \frac{\sum_k s_k^2 - 1/n}{1/n}$ where $s_k = x_k / \sum_{k=1}^{n} x_k$ represents the share of export line k (with amount exported x_k) in total services exports: x_k stands for the amount of services exports associated with the services line "k"; n represents the total number of the services export lines (k) and $n = \sum_{k=1}^{n} k$. The computed indicator has been normalized so that its values range between 0 and 100. Higher values of this index indicate greater services export concentration, while lower values show higher level of services export diversification. The indicator "THEIL" has been computed as follows: $THEIL = \frac{1}{n}\sum_{k=1}^{n} \frac{x_k}{\mu} \ln\left(\frac{x_k}{\mu}\right)$, where $\mu = \frac{1}{n}\sum_{k=1}^{n} x_k$; and n and x_k are as defined above. The indicator LINES is such that $LINES = n = \sum_{k=1}^{n} k$. The computed indicators HHI and THEIL have been normalized so that their values range between 0 and 100. Higher values of each of these two indices reflect greater services export concentration, while lower values show higher level of services export diversification. The database developed by the International Monetary Fund (IMF) (see Loungani et al., 2017) has been used to compute these indices. This database covers 11 major sectors of services (categories of services). Specifically, we have used disaggregated data on services exports at the 2-digit level to compute these three indicators. Note that the analysis has considered

[2] The list of these countries is derived from the World Bank classification of countries.

only commercial services exports (this, therefore, excludes government goods and services exports). The lag of the dependent variable has been introduced as a regressor in model (1) for several reasons. First, it helps capture the existence of a state-dependence in recipient-countries' services export diversification path. Second, this approach follows from the empirical literature on the determinants of export product diversification, where the latter has been shown to exhibit a strong persistence over time, and we believe that this also applies to services export diversification. Third, the use of the lag of the dependent variable also allows to control for omitted variables in the model specification.

The variable "REER" represents the second variable of key interest in the analysis, and stands for the measure of the real effective exchange rate. It has been extracted from the Bruegel database (see details in Appendix 1). It has been computed using a nominal effective exchange rate based on 65 trading partners. An increase in the index indicates an appreciation of the real effective exchange rate, i.e., an appreciation of the home currency against the basket of currencies of trading partners. We have applied the natural logarithm to this variable so as to reduce its high skewness.

Control variables include the real per capita income (denoted "GDPC"), the population size (denoted "POP"), the level of trade policy liberalization (denoted "TRPOL"), the level of human capital accumulation (denoted "EDU"), the depth of financial development (denoted "FINDEV") and a proxy for the institutional quality (denoted "POLITY2"). The real per capita income variable is a proxy for countries' development level, and also captures the existence of economies of scale (e.g., Marvasti, 1994; Li et al., 2005; Nyahoho, 2010; Sapir and Lutz, 1981; Schulze, 1999). The trade theory (that incorporates monopolistic competition) developed by Krugman (1981) has shown that economies of scale is one of the main determinants of trade in goods and services. The existence of economies of scale could lead to higher demand for new services and hence induce services production and export diversification. The population size variable complements the real per capita income in capturing countries' size. Bigger states likely enjoy a larger share of services in GDP (e.g., Goswami et al., 2012) because a large number of services cater directly to the final consumer. As a result, a rise in the population size induces higher demand for services, and the expansion of the services sector, which could result either in services production and export concentration or services production and export diversification. Trade policy liberalization could promote services export diversification via the positive spillovers related to the knowledge and technology embodied in the imported goods and services, the encouragement of research, and development activities and the provision of greater access to investment and intermediate goods (e.g., Agosin et al., 2012; Grossman and Helpman, 1991; Coe and Helpman 1995; Costas et al., 2008; Yanikkaya, 2003) as well as the possibility for market extension (e.g., Dennis and Shepherd, 2011). Meanwhile, greater trade policy liberalization could be associated with greater services export concentration if it leads firms to further develop the goods and services activities in which they have a comparative advantage. Similarly, a better educated workforce could be associated with services export diversification if this workforce is employed to develop new exportable services items (see Agosin et al. 2012 for the case of export product diversification). In contrast, the educated workforce is employed to expand the production and export of existing services activities, then higher education would result in a higher degree of services export concentration. Greater financial development could lead to services export concentration if firms concentrate their financial resources on existing goods and services activities where the economy already enjoys a competitive advantage. In contrast, if financing-dependent firms use the financial resources to

develop more differentiated products and services, financial development would be positively associated with services export diversification (see also Agosin et al., 2012 for the case of the effect of financial development on export product diversification). Institutional quality could also play an important role in services export diversification, including through the promotion of trade in goods, notably manufacturing exports and export product diversification (e.g., Amighini and Sanfilipo, 2014; Faruq, 2011; Hausmann et al., 2007; Zhu and Fu, 2013). In light of this, we could expect better institutional and governance quality to result in services export diversification if they permit trading firms to develop new goods and services activities. Conversely, improvement in the quality of institutions and governance could generate services export concentration if such an improvement results in the expansion of existing goods and services activities.

[Insert Figure 1, here]

[Insert Figure 2, here]

A simple correlation pattern between real exchange rate and each of the three indicators of services export concentration is provided in Figure 1 for the full sample and in Figure 2 for the two sub-samples, HICs and developing countries. The graphs in Figure 1 show a positive correlation between real effective exchange rate and services export concentration. Similar correlation patterns are observed in Figure 2 for developing countries. However, for HICs, the real exchange rate is negatively correlated with HHI, but its correlation pattern with THEIL and LINES indicators remain unclear.

3.2. Estimation strategy

The empirical analysis draws from the empirical studies on the determinants of export product diversification (e.g., Agosin et al., 2012; Amighini and Sanfilipo, 2014; Zhu and Fu, 2013; Gnangnon, 2019a, 2019b; Gnangnon and Roberts, 2017; Kim, 2019; Osakwe et al., 2018) and uses the two-step system Generalized Methods of Moments[3] (GMM) estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998). In the current analysis, we consider the variables "REER", "EDU", "TRPOL", "GDPC", "FINDEV", "POLITY2" as endogenous given the existence of a possible reverse causality from each of these variables to the dependent variable (the so-called simultaneity bias). Three diagnostic tests are used to evaluate the appropriateness of the two-step system GMM estimator. These include the Arellano-Bond test of first-order serial correlation in the error term (denoted AR(1)), the Arellano-Bond test of no second-order autocorrelation in the error term (denoted AR(2)) and the Sargan test of over-identifying restrictions, which determines the joint validity of the instruments used in the estimations. Finally, we report the number of instruments used in the regressions as the rule of thumb provides that a higher number of instruments than the number of countries may reduce the power of the afore-mentioned tests (e.g., Roodman, 2009).

For the empirical analysis, all regressions have been performed by consistently using the three indicators of services export concentration described above. Table 1 shows the results of the estimation of model (1). In Table 2, we present the results of the specifications of model (1) that purport to explore the effect of real exchange rate on services export diversification in HICs versus "NonHICs". Hence, these results would allow obtaining the effect of real exchange rate on services

[3] Further details on this estimator could be found for example in the above-mentioned studies on the determinants of export product diversification.

export concentration in both HICs and developing countries. To that effect, the model (1) specifications that are estimated - with each of the indicators of services export concentration – include a dummy variable (denoted "HIC") that takes the value 1 for HICs and 0, otherwise, along with the interaction variable that captures the interaction between this dummy and the real exchange rate variable.

4. Analysis of empirical results

To start with, we first examine the results of the diagnostic tests that help to assess the appropriateness of the two-step system GMM estimator (see the bottom of Tables 1 and 2). It is important to underline that to meet the requirements of these tests, we have included two lags of the dependent variable in the regressions, as with only one lag of this dependent variable as a regressor, these requirements were not met. Across the two Tables, we obtain that the coefficients of the lags of the dependent variable are statistically significant at the 1% level. This underscores the persistence nature of the indices of services export concentration over time, and confirms the need for considering a dynamic specification in the analysis. We also obtain that: the p-values related to the AR(1) test are always lower than 0.01 (the 1% level of statistical significance); the p-values associated with the AR (2) test are all higher than 0.10; the p-values related to the OID test are also consistently higher than 0.10; and the number of countries is always higher than the number of instruments across all columns. Overall, the results of these diagnostic tests are full satisfactory, and show that the two-step system GMM estimator could be used to perform the empirical analysis.

[Insert Table 1, here]

Results in Table 1 indicate that real effective exchange rate is positively and significantly associated with HHI and THEIL indicators, but negatively and significantly associated with LINES indicator. These, therefore, suggest that appreciations of the real effective exchange rate induce higher services export concentration and a fall in the number of services export lines. In terms of magnitude of the effects, we note that an appreciation of the real effective exchange rate by 100 per cent induces a rise in indices HHI and THEIL respectively by 11 points and 9 points, and a fall in the total number of services export lines by 4.5 points. The magnitudes of these different impacts clearly show the relevance of exchange rate policies for services export diversification. For control variables, we obtain across columns [1] and [2] that a rise in the real per capita income is associated with a higher level of services export diversification. Trade policy liberalization tends to be positively associated with services export diversification (see results in column [2]). However, institutional quality and the population size appear to influence positively services export concentration. While financial development does not exert a significant effect on services export concentration, we note that the education level is negatively and significantly associated with HHI, but positively and significantly associated with THEIL. The differences between the sign of these estimates of the education level in columns [1] and [2] may be attributed to the differences in the way these indices have been computed (see for example, Palan, 2010 who has discussed the advantages and limitations of using varying indices of specialization, including HHI and THEIL indices). At best, the impact of human capital on services export diversification deserves another study, which goes beyond the purpose of the current analysis. The estimations' outcomes provided in column [3] of Table 1 show that among all control variables only the real

per capita income and the education level variables appear to be statistically significant at the conventional levels. In particular, we obtain a negative effect of the real per capita income on the total number of services export lines, which signifies that countries with lower real per capita income levels tend to experience a high number of total services export lines compared to relatively advanced countries. A rise in the education level induces a rise in the total number of services export lines.

[Insert Table 2, here]

Turning now to estimates displayed in Table 2, we find that the net effect of the real effective exchange rate appreciation n HHI in HICs amounts 50.56. For developing countries, we might be tempted to conclude that real effective exchange rate does not affect services export diversification measured by HHI, as the coefficient of the "REER" variable is not statistically significant. However, this statistically nil impact may hide differentiated effects across developing countries. The appreciation of the real effective exchange rate exerts a positive and significant effect on THEIL and reduces the total number of services export lines in HICs and developing countries alike, with the magnitude of these impacts amounting to 18.56 and -3.96 respectively for THEIL and LINES indicators. Results concerning control variables in columns [1] to [3] are in line with those obtained in Table 1.

5. Conclusion

This article has explored the services export diversification effect of the real effective exchange rate., using a sample of 125 countries over the period 1985-2014. Results have shown that an appreciation of the real effective exchange rate exerts a strong positive impact on services export concentration (i.e., it discourages the diversification of services exports) and reduces the total number of services export lines, and these effects concern both high income countries and developing countries. These findings, therefore, complement previous (although few) studies) on the negative effects of exchange rate appreciations on the volume (and values) of services exports, and highlight the strong importance of real exchange policies in promoting services export diversification in high-income countries and developing countries alike.

References

Abeysinghe, T., and Yeok, T. L. (1998). Exchange rate appreciation and export competitiveness. The case of Singapore, Applied Economics, 30(1), 51-55.

Adityaa, A., and Acharyya, R. (2015). Trade liberalization and export diversification. International Review of Economics & Finance, 39, 390-410.

Adlung, R. (2007). The Contribution of Services Liberalization to Poverty Reduction: What Role for the GATS? Staff Working Paper ERSD-2007-01. World Trade Organization, Geneva.

Agosin, R., Alvarez, R., and Bravo-Ortega, C. (2012). Determinants of Export Diversification around the World: 1962-2000. The World Economy, 35(3), 295-315.

Amighini, A., and Sanfilippo, M. (2014). Impact of South-South FDI and trade on the export upgrading of African economies. World Development, 64, 1-17.

Anand, R., Mishra, S., and Spatafora, N. (2012). Structural Transformation and the Sophistication of Production. IMF Working Paper, WP/12/59. International Monetary Fund, Washington, D.C.

Arellano, M. and Bover, O. (1995). Another look at the instrumental variable estimation of error-components models. Journal of Econometrics 68 (1), 29-51.

Athukorala, P. (1991) Exchange rate pass-through: The case of Korean exports of manufactures, Economic Letters, 35, 79-84.

Athukorala, P. (1995). Foreign Direct Investment and Manufacturing for Export in a New Exporting Country: The Case of Sri Lanka. The World Economy, 18(4), 543-564.

Athukorala, P., and Menon, J. (1994) Pricing to market behaviour and exchange rate pass-through in Japanese exports, Economic Journal, 104, 271-81.

Baggs, J., Beaulieu, E., and Fung, L. (2010). Are service firms affected by exchange rate movements? The Review of Income and Wealth, 56(1), S156-S176.

Baldwin, R. and Krugman, P. (1989). Persistent Trade Effects of Large Exchange Rate Shocks. The Quarterly Journal of Economics, 104(4), 635-654.

Berg, A., Hussain, M., Aiyar, S., Roache, S., and Mahone, A. (2005). The Macroeconomics of Managing Increased Aid Inflows: Experiences of Low-Income Countries and Policy Implications. International Monetary Fund, Washington.

Blundell, R., and Bond, S. (1998). Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. Journal of Econometrics, 87, 115–143.

Bowsher, C.G. (2002). On testing overidentifying restrictions in dynamic panel data models. Economics Letters, 77(2), 211-220.

Cadot, O., Carrere, C., and Strauss-Kahn, V. (2011). Export Diversification: What's Behind the Hump? Review of Economics and Statistic, 93, 590-605.

Coe, D.T., and Helpman, E. (1995). International R and D spillovers. European Economic Review 39, 859-87.

Costas, A., Demidova, S. Klenow P. and Rodriguez-Clare, A. (2008). Endogenous Variety and the Gains from Trade. American Economic Review Papers and Proceedings, 98, 2, 444-50.

Darvas, Z. (2012a). Real effective exchange rates for 178 countries: a new database. Working Paper 2012/06, Bruegel, Belgium.

Darvas, Z. (2012b). Compositional effects on productivity, labour cost and export adjustment. Policy Contribution 2012/11, Bruegel, Belgium.

Dennis, A. and Shepherd B. (2011). Trade Facilitation and Export Diversification. The World Economy, 34(1), 101-122.

Dreher, A. (2006). Does globalisation affect growth? Evidence from a new index of globalisation. Applied Economics, 38(10), 1091-1110.

Eichengreen, B., and Gupta, P. (2013). The Real Exchange Rate and Export Growth Are Services Different? World Bank Policy Research Working Paper 6629, World Bank, Washington, D.C.

Elbadawi, I. (2002). Real exchange rate policy and non-traditional exports in developing countries. In Non-traditional export promotion in Africa: Experiences and issues, ed. G.K. Helleiner. New York: Palgrave.

Faruq, H. (2011). How institutions affect export quality. Economic Systems, 35, 586-606.

Fiorini, M., and Hoekman, B. (2018). Restrictiveness of Services Trade Policy and the Sustainable Development Goals. ADBI Working Paper 903. Asian Development Bank Institute, Tokyo.

François, J., and Hoekman, B. (2010). Services Trade and Policy. Journal of Economic Literature, 48(3), 642-692.

Freund, C., and Pierola, M. D. (2012). Export Surges. Journal of Development Economics 97, 387-395.

Freund, C., and Weinhold, D. (2002). The Internet and international trade in services. American Economic Review, 92, 236–240.

Fung, L. (2008). Large Real Exchange Rate Movements, Firm Dynamics, and Productivity Growth. Canadian Journal of Economics 41(2), 391-424.

Fung, L., and Liu, J-T. (2009). The impact of real exchange rate movements on firm performance: A case study of Taiwanese manufacturing firms. Japan and the World Economy, 21(1), 85-96.

Ghani, E., and Kharas, H. (2010). 'The Service Revolution Overview', in E. Ghani (ed.), The Service Revolution in South Asia (Oxford: Oxford University Press), 1-34.

Gnangnon, S.K. (2019a). Aid for trade and export diversification in recipient-countries. The World Economy, 42(2), 396-418.

Gnangnon, S.K. (2019b). Does the Impact of Aid for Trade on Export Product Diversification depend on Structural economic policies in Recipient-Countries? Economic Issues, 24(1), 59-87.

Goswami, A. G., Gupta, P., and Mattoo, A. (2011). 'A Cross-Country Analysis of Service Exports: Lessons from India.' In "Exporting Services - A Developing Country Perspective", Chapter 3, Edited by Goswami, A. G., Mattoo, A., and Sáez, S. International Bank for Reconstruction and Development/International Development Association or The World Bank, Washington DC.

Grobar, L.M. (1993). The effect of real exchange rate uncertainty on LDC manufactured exports. Journal of Development Economics, 41(2), 367-376.

Grossman, G.M., and Helpman, E. (1991). Innovation and Growth in the Global Economy. MIT Press, Cambridge, MA, London, United Kingdom.

Grosso, G.M. (2008). Analysis of Subsidies for Services: The case of export subsidies. OECD Trade Policy Working Paper No. 66. OECD, Paris.

Guzman, M., Ocampo, A.J., and Stiglitz, J.E. (2018). Real exchange rate policies for economic development. World Development, 110, 51-62.

Gygli, S., Haelg, F., Potrafke, N., and Sturm, J-E. (2019). The KOF Globalisation Index - Revisited. Review of International Organizations, 14(3), 543-574.

Hausmann, R., Hwang, J., and Rodrik, D. (2007). What you export matters. Journal of economic growth, 12(1), 1-25.

Hoekman, B. (2017). Trade in services - Opening markets to create opportunities. UNU-WIDER Working Paper 2017/31. United Nations University World Institute for Development Economics Research, Helsinki, Finland.

Hoekman, B., and Mattoo, A. (2008). Services Trade and Growth, Policy Research Working Paper No. 4461. World Bank, Washington, D.C.

Hoekman, B., and Shepherd, B. (2017). Services Productivity, Trade Policy, and Manufacturing Exports. World Economy, 40(3), 499-516.

Hunegnaw, F. B. (2017). Real Exchange Rate and Manufacturing Export Competitiveness in Eastern Africa. Journal of Economic Integration, 32(4), 891-912.

Imbs, J., and Wacziarg, R. (2003). Stages of Diversification. American Economic Review, 93(1), 63-86.

Itskhoki, O., and Moll, B. (2014). Optimal development policies with financial frictions. National Bureau of Economic Research. Working Paper No. 1994, United States.

Kim, Y.R. (2019). Does aid for trade diversify the export structure of recipient countries? The World Economy, 42(9), 2684-2722.

Kimura, F., and Lee, H. H. (2006). The gravity equation in international trade in services. Review of World Economics, 142(1), 92-121.

Krugman, P.R. (1981). Intra-industry specialization and gains from trade. Journal of Political Economy 89 (7), 959-973.

Kwasi, O. C. (2018). Is the effect of exchange rate volatility on export diversification symmetric or asymmetric? Evidence from Ghana. Cogent Economics & Finance, 6(1), 1460027.

Lanz, R., and Maurer, A. (2015). Services and global value chains: Some evidence on servicification of manufacturing and services networks. Journal of International Commerce, Economics and Policy, Vol 06, No. 03, 1550014.

Loungani, P., Mishra, S., Papageorgiou, C., and Wang, K. (2017). World Trade in Services: Evidence from A New Dataset. IMF Working Paper WP/17/77, International Monetary Fund, Washington, D.C.

Mao, R., Yao, Y., and Zou, J. (2019). Productivity growth, fixed exchange rates, and export-led growth. China Economic Review, Volume 56, Article 101311.

Marshall, M.G., Gurr, T.R., and Jaggers, K. (2018). Polity IV Project: Political Regime Characteristics and Transitions, 1800-2017. Centre for Systemic Peace: Vienna, VA.

Marvasti, A. (1994). International trade in cultural goods: a cross-sectional analysis. Journal of Cultural Economics, 18(2), 135-148.

Melitz, M. J., and Ottaviano, G. I. P. (2008). Market size, trade, and productivity. Review of Economic Studies, 75, 295-316.

Michaelowa, K., Weber, A. (2006). Aid effectiveness reconsidered: panel data evidence for the education sector. In: HWWA Discussion Paper 264 (Revised) Hamburg Institute of International Economics, Hamburg, Germany.

Nouira, R., Plane, P., and Sekkat, K. (2011). Exchange rate undervaluation and manufactured exports: A deliberate strategy? Journal of Comparative Economics 39, 584-601.

Nyahoho, E. (2010). Determinants of Comparative Advantage in the International Trade of Services: An Empirical Study of the Hecksher-Ohlin Approach. Global Economy Journal, 10(1), 1-24.

Osakwe, P.N., Santos-Paulino, A.U., and Dogan, B. (2018). Trade dependence, liberalization, and exports diversification in developing countries. Journal of African Trade, 5(1-2), 19-34.

Palan, N. (2010). Measurement of Specialization. The Choice of Indices, FIW Working Paper, No. 62, FIW - Research Centre International Economics, Vienna.

Parteka, A., and Tamberi, M. (2013). What determines export diversification in the development process? Empirical assessment. The World Economy, 36(6), 807-826.

Ramzi, A. (2013). The exchange rate, diversification, and distribution in a modified Ricardian model with a continuum of goods. The Manchester School, 81(3), 356-385.

Rodrik, D. (2008). The Real Exchange Rate and Economic Growth. Brookings Papers on Economic Activity 39(2), 365-439.

Rodrik, D. (2009). Industrial Policy: Don't Ask Why, Ask How. Middle East Development Journal 1(1), 1-29.

Roodman, D. M. (2009). A note on the theme of too many instruments, Oxford Bulletin of Economic and Statistics, 71 (1), 135–158.

Sahoo, P., and Dash, R. K. (2014). India's surge in modern services exports: Empirics for policy. Journal of Policy Modeling, 36, 1082–1100.

Sapir, A., and Lutz, E. (1981). Trade in services: economic determinants and development-related issues. World Bank Working Paper No. 480, World Bank, Washington, D.C.

Schulze, G. (1999). International Trade in Arts. Journal of Cultural Economics, 23(1), 109-136.

Sekkat, K. (2016). Exchange rate misalignment and export diversification in developing countries. The Quarterly Review of Economics and Finance, 59, 1-14.

Sekkat, K., and Varoudakis, A. (2000). Exchange rate management and manufactured exports in Sub-Saharan Africa. Journal of Development Economics, 61(1), 237-253.

Smith, M. (2004). The Impact of the Real Exchange Rate on Export Volumes. Reserve Bank of New Zealand Bulletin 67(1), 5-13.

Tran, T. A-D., Minh Hong Phi, T., and Diaw, D. (2017). Export diversification and real exchange rate in emerging Latin America and Asia: A South–North vs. South-South decomposition. The Journal of International Trade & Economic Development, 26(6), 649-676.

Van Der Marel, E. (2012). Determinants of comparative advantage in services. Working paper no. 87. Vienna: FIW.

Van Welsum, D. (2003). International Trade in Services: Issues and Concepts. Birkbeck College, School of Economics, Mathematics and Statistics, Economics Working Paper 04/03.

Wondemu, K., and Potts, W. (2016). The Impact of the Real Exchange Rate Changes on Export Performance in Tanzania and Ethiopia. AfDB Working Paper No 240. African Development Bank, Abidjan, Côte d'Ivoire.

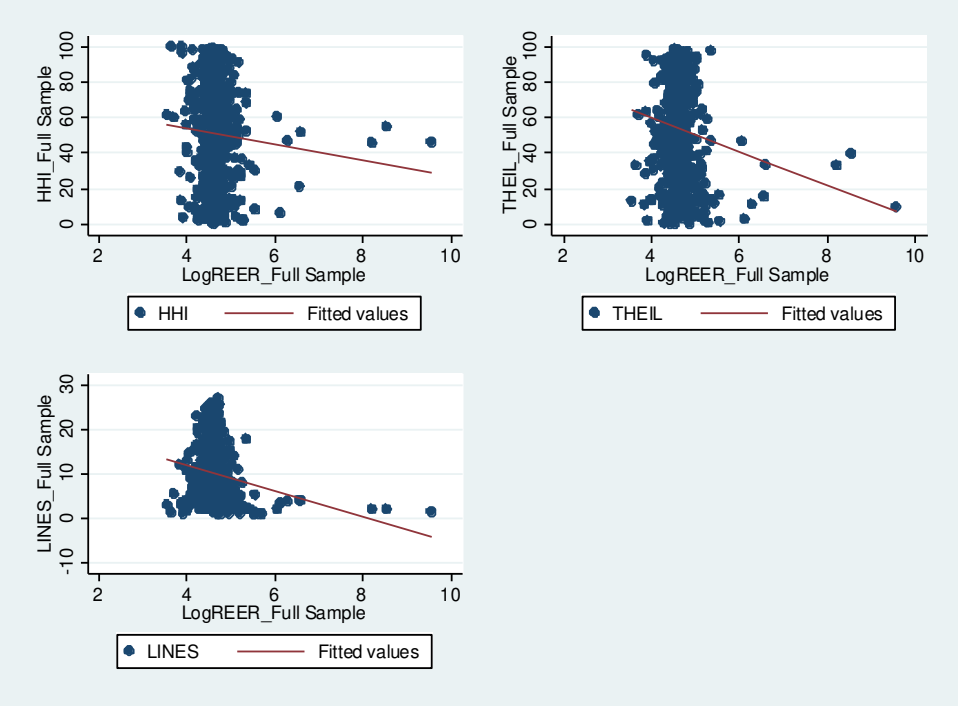
WTO (2019). World Trade Report 2019: The Future of Services Trade. WTO Secretariat, Geneva. See online at: https://www.wto.org/english/news_e/news19_e/wtr_09oct19_e.htm

Yanikkaya, H. (2003). Trade openness and economic growth: a cross-country empirical investigation. Journal of Development Economics 72, 57-89.

Zhu, S., and Fu, X. (2013). Drivers of Export Upgrading. World Development, 51, 221-233.

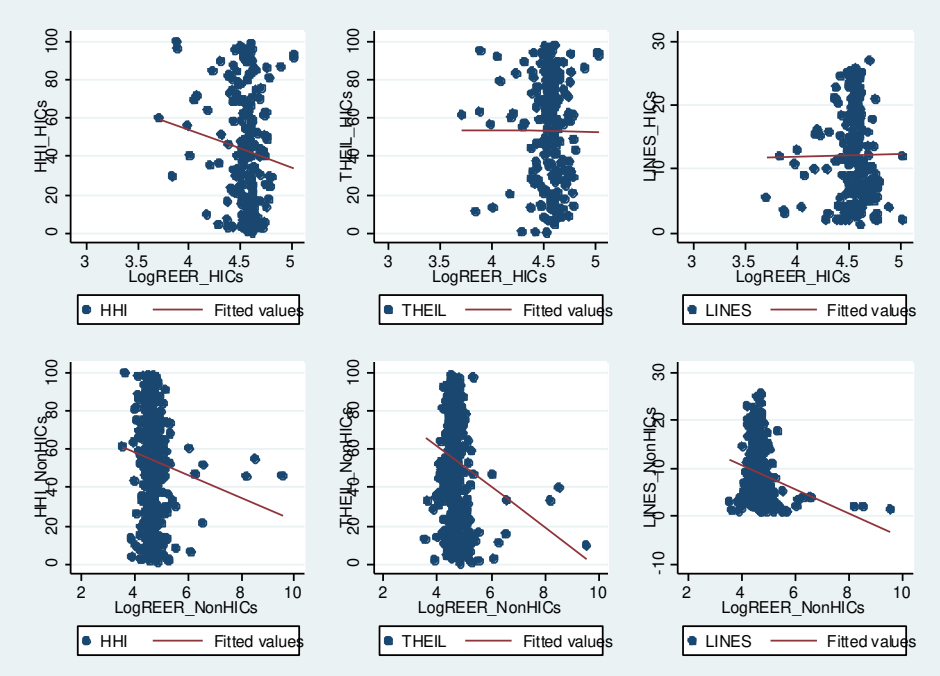
FIGURES

Figure 1: Correlation pattern between real effective exchange rate and indices of services export concentration over the entire sample



Source: Author

Figure 2: Correlation pattern between real effective exchange rate and indices of services export concentration over the sub-samples of HICs and NonHICs



Source: Author

TABLES and APPENDICES

Table 1: Effect of real exchange rate on services export diversification
Estimator: Two-Step System GMM

VARIABLES	HHI	THEIL	LINES
	(1)	(2)	(3)
One-period Lag of the Dependent Variable	0.539***	0.394***	0.780***
	(0.0210)	(0.0219)	(0.0301)
Two-period Lag of the Dependent Variable	-0.0714***	-0.196***	-0.174***
	(0.0161)	(0.0222)	(0.0310)
Log(REER)	11.04***	9.044**	-4.512***
	(3.641)	(4.580)	(0.571)
Log(GDPC)	-3.974**	-4.625***	-0.650**
	(1.652)	(1.691)	(0.259)
TRPOL	-0.0232	-0.200***	0.00414
	(0.0649)	(0.0564)	(0.0117)
EDU	-0.159***	0.110**	0.0260***
	(0.0438)	(0.0472)	(0.00592)
FINDEV	0.0443	0.0352	-0.00171
	(0.0341)	(0.0377)	(0.00502)
POLITY2	0.681***	1.512***	-0.00440
	(0.207)	(0.234)	(0.0340)
Log(POP)	2.540**	3.479***	0.182
	(1.046)	(1.063)	(0.190)
Constant	-1.687	-33.52	23.58***
	(28.28)	(24.58)	(4.471)
Observations - Countries	347 - 125	347 - 125	357 - 125
Number of Instruments	89	89	89
AR1 (P-Value)	0.0048	0.0023	0.0020
AR2 (P-Value)	0.5180	0.4367	0.4539
Sargan (P-Value)	0.1765	0.1694	0.3585

*Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust Standard Errors are in parenthesis. In the two-step system GMM estimations, the variables "REER", "EDU", "TRPOL", "GDPC", "FINDEV" and "POLITY2" have been considered as endogenous. The variable "POP" has been considered as exogenous. Time dummies have been included in the regressions. The latter have used a maximum of 3 lags of the dependent variables as instruments and 3 lags of endogenous variables as instruments. It is also worth noting that the regressions have used 2 lags of the dependent variables as a regressors because with only one-period lag of the dependent variable, the requirements of the two-step system GMM approach were not met. We have applied the natural logarithm to the variables "REER", "GDPC" and "POP" in order to reduce their high skewness.*

Table 2: Effect of real exchange rate on services export diversification in HICs versus NonHICs
Estimator: Two-Step System GMM

Variables	HHI	THEIL	LINES
	(1)	(2)	(3)
One-period Lag of the Dependent Variable	0.641***	0.345***	0.813***
	(0.0276)	(0.0292)	(0.0271)
Two-period Lag of the Dependent Variable	-0.0518***	-0.183***	-0.145***
	(0.0186)	(0.0223)	(0.0309)
Log(REER)	6.985	18.56***	-3.964***
	(4.386)	(5.343)	(0.646)
HIC*[Log(REER)]	50.56***	-21.96	-3.424
	(8.262)	(14.46)	(2.262)
HIC	-231.2***	78.59	14.26
	(38.17)	(66.72)	(10.44)
Log(GDPC)	-3.026	0.435	-0.485**
	(2.067)	(1.673)	(0.228)
TRPOL	-0.114*	-0.267***	0.00982
	(0.0614)	(0.0779)	(0.0109)
EDU	-0.120**	0.125***	0.0260***
	(0.0483)	(0.0404)	(0.00605)
FINDEV	0.0830***	0.0614**	-0.000541
	(0.0305)	(0.0303)	(0.00518)
POLITY2	0.744***	1.314***	-0.0373
	(0.191)	(0.193)	(0.0364)
Log(POP)	1.326	1.234	-0.196
	(1.117)	(0.859)	(0.230)
Constant	16.64	-74.04**	25.15***
	(29.14)	(29.89)	(5.510)
Observations - Countries	347 - 125	347 - 125	357 - 125
Number of Instruments	87	87	87
AR1 (P-Value)	0.0031	0.0038	0.0031
AR2 (P-Value)	0.2392	0.4856	0.3502
Sargan (P-Value)	0.3131	0.3045	0.3430

*Note: *p-value<0.1; **p-value<0.05; ***p-value<0.01. Robust Standard Errors are in parenthesis. In the two-step system GMM estimations, the variables "REER", "EDU", "TRPOL", "GDPC", "FINDEV", "POLITY2" and the interaction variable have been considered as endogenous. The variable "POP" has been considered as exogenous. Time dummies have been included in the regressions. The latter have used a maximum of 3 lags of the dependent variables as instruments and 3 lags of endogenous variables as instruments. It is also worth noting that the regressions have used 2 lags of the dependent variables as a regressors because with only one-period lag of the dependent variable, the requirements of the two-step system GMM approach were not met. We have applied the natural logarithm to the variables "REER", "GDPC" and "POP" in order to reduce their high skewness.*

Appendix 1: Definition and Source of variables

Variables	Definition	Sources
HHI	This is the Herfindahl index, which is also referred sometimes to as the Hirschman-Herfindahl index. It has been computed as follows: $HHI = \frac{\sum_k s_k^2 - 1/n}{1/n}$ where $s_k = x_k / \sum_{k=1}^{n} x_k$ represents the share of export line k (with amount exported x_k) in total exports: x_k stands for the amount of services exports associated with the services line "k"; n represents the total number of the services export lines (k) and $n = \sum_{k=1}^{n} k$. The calculated indicator has been normalized so that its values range between 0 and 100. Higher values of this index indicate greater services export concentration, while lower values show greater services export diversification.	Author's calculation based on data extracted from the database developed by the International Monetary Fund (IMF) on the international trade in services (see online at: https://data.imf.org/?sk=07109577-E65D-4CE1-BB21-0CB3098FC504) - See also Loungani et al. (2017). The data used to compute the HHI indicator are sectoral data on services exports at 2-digit level, which is the maximum digit-level of disaggregated data available on services. In particular, we have relied on 11 major sectors of services (categories of services) – at the 1-digit level - and used the disaggregated data on services exports for sub-sectors at the 2-digit level. See Loungani et al. (2017: page 20, Table 1) for the 11 major services sectors and the related sub-sectors covered in the analysis.
THEIL	This variable represents the Theil index of services export concentration. It has been calculated using the following formula (for example, see Agosin et al, 2012; Cadot et al., 2011): $THEIL = \frac{1}{n} \sum_{k=1}^{n} \frac{x_k}{\mu} \ln\left(\frac{x_k}{\mu}\right)$, where $\mu = \frac{1}{n} \sum_{k=1}^{n} x_k$ n represents the total number of the (services) export lines (k) $n = \sum_{k=1}^{n} k$; x_k stands for the amount of services exports associated with the services line "k".	Author's calculation based on the same data (extracted from the IMF database on the international trade in services) used to compute the HHI indicator described above.
LINES	This is the total number of services export lines for a given country per year. $LINES = n = \sum_{k=1}^{n} k.$	Author's computation based on services exports data (at the 2-digit level) described above.
REER	This the index measuring the Real Effective Exchange Rate. The REER is computed using a nominal effective exchange rate based on 65 trading partners. An increase in the index indicates an appreciation of the real effective	Bruegel Datasets (see Darvas (2012a, 2012b)). The datatset could be found online at: http://bruegel.org/publications/datasets/real-effective-exchange-rates-for-178-countries-a-new-database/

	exchange rate, i.e., an appreciation of the home currency against the basket of currencies of trading partners.	
GDPC	Per capita Gross Domestic Product (constant 2010 US$)	World Development Indicators (WDI), 2019
TRPOL	This is the main measure of trade openness. It is in fact the De Jure measure of trade openness, i.e., the De Jure Trade Globalisation index (see Dreher, 2006 and Gygli et al. 2019). It is a composite index of trade in goods, trade in services and trade partner diversity.	See the database and other information online at: https://www.kof.ethz.ch/en/forecasts-and-indicators/indicators/kof-globalisation-index.html
EDU	This is the average of the gross primary school enrollment (%), gross secondary school enrollment (%), and gross tertiary school enrollment (%).	Author's calculation based on data collected from the WDI.
FINDEV	Domestic credit to private sector (% of GDP). Missing values have been replaced with data on the domestic credit to private sector by banks (% of GDP).	Author's calculation based on data extracted from the WDI.
POP	This is the measure of the total Population	WDI, 2019
POLITY2	This variable is an index extracted from Polity IV Database (Marshall et al., 2018). It represents the degree of democracy based on competitiveness of political participation, the openness and competitiveness of executive recruitment and constraints on the chief executive. Its values range between -10 and +10, with lower values reflecting autocratic regimes, and greater values indicating democratic regimes. Specifically, the value +10 for this index represents a strong democratic regime, while the value -10 stands for strong autocratic regime.	Polity IV Database (Marshall et al., 2018)

Appendix 2: Descriptive statistics on variables used in the model

Variable	Observations	Mean	Standard Deviation	Minimum	Maximum
HHI	695	51.015	28.906	0.000	100.000
THEIL	695	53.646	27.459	0.000	98.801
LINES	705	9.927	6.259	1	27
GDPC	725	11165.440	16977.380	153.903	105761.9
POLITY2	732	3.724	6.245	-10	10
POP	750	4.22e+07	1.48e+08	321270.8	1.35e+09
REER	734	138.766	567.182	14.918	14144.000
EDU	635	194.829	61.329	30.858	332.421
FINDEV	665	41.009	38.921	0.186	246.576
TRPOL	733	50.213	24.777	7.401	97.122

Appendix 3: List of countries contained in the Entire Sample

Entire sample				HIC
Albania	Fiji	Mali	Tajikistan	Australia
Angola	Finland	Mauritius	Tanzania	Austria
Argentina	France	Mexico	Thailand	Bahrain
Armenia	Gabon	Moldova	Togo	Belgium
Australia	Gambia, The	Mongolia	Trinidad and Tobago	Canada
Austria	Georgia	Morocco	Tunisia	Chile
Bahrain	Germany	Mozambique	Turkey	Croatia
Bangladesh	Ghana	Namibia	Uganda	Cyprus
Belarus	Greece	Nepal	Ukraine	Czech Republic
Belgium	Guatemala	Netherlands	United Kingdom	Denmark
Benin	Guinea	New Zealand	United States	Estonia
Botswana	Guinea-Bissau	Nicaragua	Uruguay	Finland
Brazil	Guyana	Niger	Venezuela	France
Bulgaria	Honduras	Norway	Yemen	Germany
Burkina Faso	Hungary	Oman		Greece
Burundi	India	Pakistan		Hungary
Cabo Verde	Indonesia	Panama		Ireland
Cambodia	Iran	Papua New Guinea		Israel
Cameroon	Ireland	Paraguay		Italy
Canada	Israel	Peru		Kuwait
Chile	Italy	Philippines		Lithuania
China	Jamaica	Poland		Luxembourg
Colombia	Jordan	Portugal		Netherlands
Congo, Democratic Republic of the	Kazakhstan	Romania		New Zealand
Congo, Republic of	Kenya	Russia		Norway
Costa Rica	Kuwait	Rwanda		Oman
Croatia	Kyrgyz Republic	Senegal		Poland
Cyprus	Lao P.D.R.	Sierra Leone		Portugal
Czech Republic	Lebanon	Slovak Republic		Slovak Republic
Côte d'Ivoire	Lesotho	Slovenia		Slovenia
Denmark	Liberia	South Africa		Sweden
Dominican Republic	Lithuania	Sri Lanka		Switzerland
Ecuador	Luxembourg	Sudan		Trinidad and Tobago
Egypt	Macedonia, FYR	Suriname		United Kingdom
El Salvador	Madagascar	Swaziland		United States
Estonia	Malawi	Sweden		Uruguay
Ethiopia	Malaysia	Switzerland		

Figures

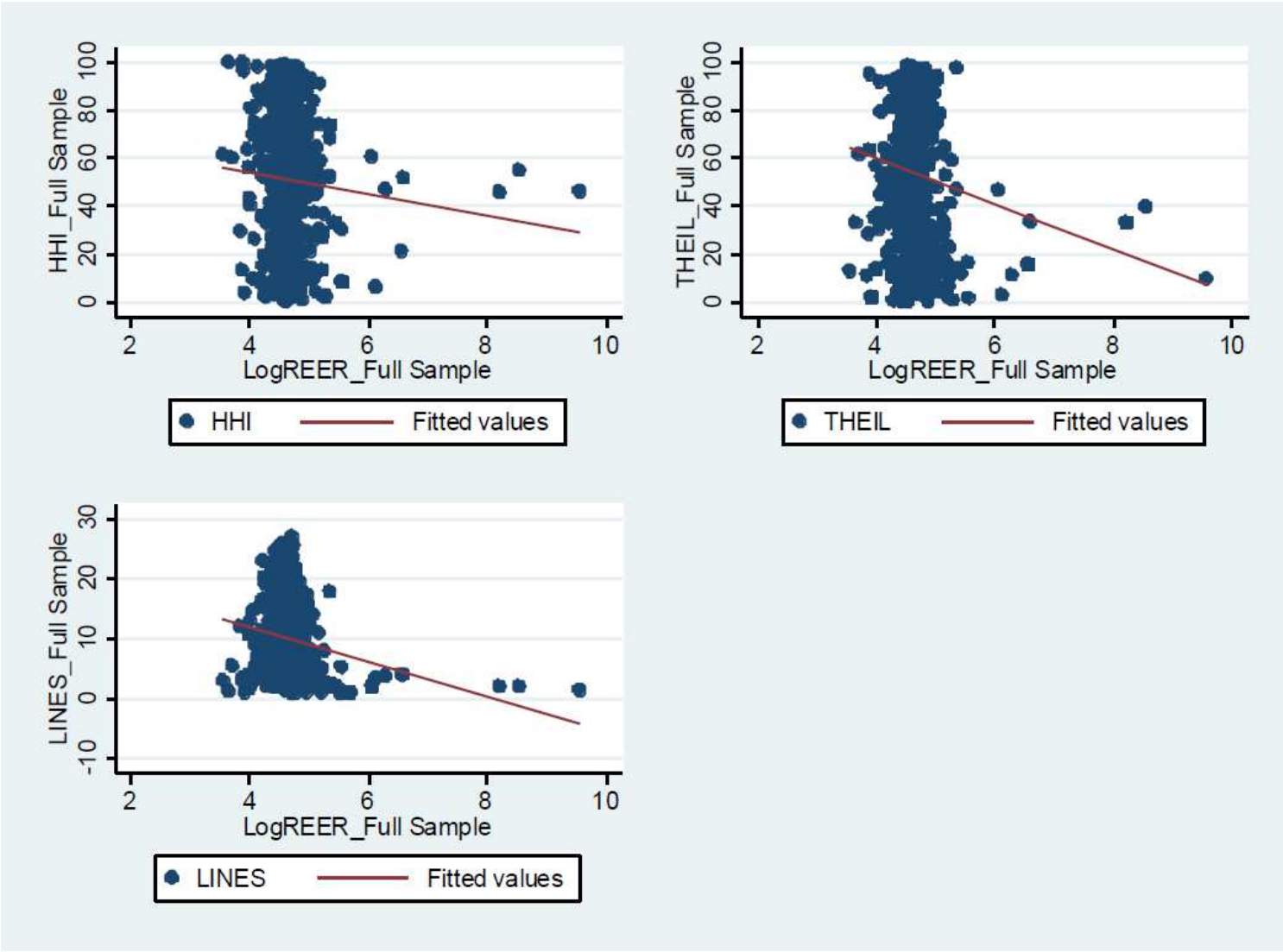


Figure 1

Correlation pattern between real effective exchange rate and indices of services export concentration over the entire sample. Source: Author

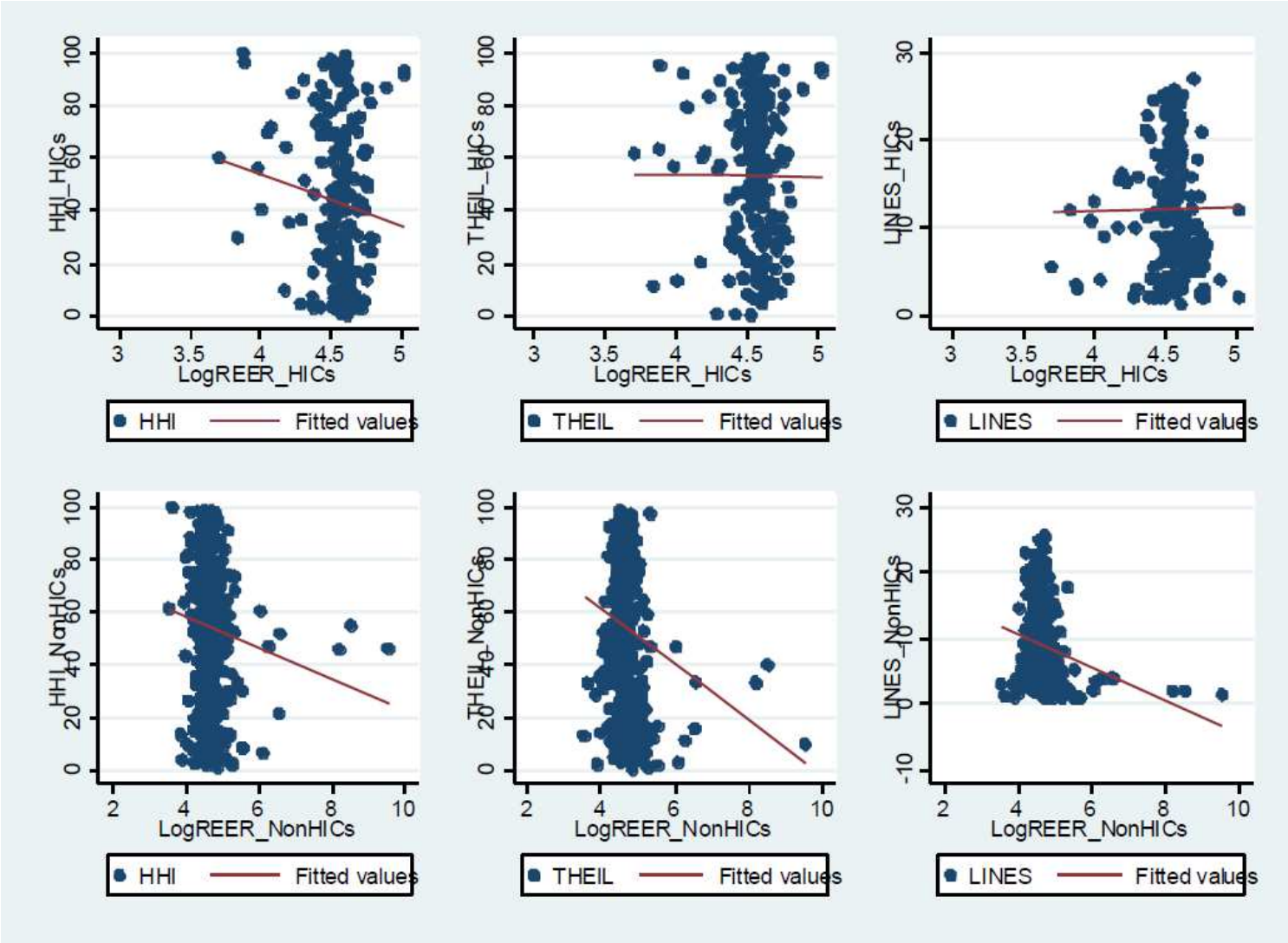


Figure 2

Correlation pattern between real effective exchange rate and indices of services export concentration over the sub-samples of HICs and NonHICs. Source: Author