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## Export Revenue and Remittances Sent from Migrants' Host-Countries

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### Abstract

This article investigates empirically how export revenue in migrants' host-countries influences the aggregate amount of remittances sent by migrants from these countries to their home-countries. It further investigates how the volatility of export revenue in migrants' host countries affects the volatility of the amount of remittances sent by migrants. The empirical analysis has been carried out on a panel dataset comprising 23 developed countries over the period 1975-2016. Using the fixed effects estimator, it has shown that a rise in export revenues is associated with a higher amount of remittances sent by migrants to their home-countries. Furthermore, higher volatility of export revenue generates a higher volatility of the amount of remittances sent. These findings have two policy implications. First, by improving the business environment for their exporting firms, and devising domestic policies that help reduce the volatility of export revenue, policymakers in the host-countries of migrants (mainly here, developed countries) would allow higher amounts of remittances to accrue from these countries to their home-countries. These remittances are well known to be critical for the promotion of economic growth and development of the home-countries of migrants.

**Keywords:** Export revenue; Export revenue volatility; Remittances sent; Volatility of remittances sent.

JEL Classification: F14, F24

### Introduction

The literature on the determinants and impact of migrants' remittances is vast. Specifically, the bulk of the existing literature on the macroeconomic determinants of migrants' remittances has relied on a framework of country/year or a bilateral setting (i.e., country-pair<sup>1</sup>/year). A number of macroeconomic factors has been identified as key to explain the amount of migrants' remittances received, and include the number of workers, the wage rates, the economic situation in the host country of the migrants, the economic situation in the migrants' country of origin, the exchange rate in the home country

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<sup>1</sup> Country-pair refers to the country of origin and the country of destination of migrants.



of migrants, the relative interest rate between the sending and the recipient countries, the institutional quality as well as some demographic and financial/political characteristics in the recipient-country (e.g., El-Sakka & McNabb, 1999; Freund and Spatafora, 2005; Gupta, 2005; Schiopu and Siegried, 2006; Chami et al, 2008; Adams, 2009). This literature has neglected the role that trade, in particular exports could play in explaining the amount of remittances sent by migrants. The current study aims to fill this gap in the strand of literature on the macroeconomic determinants of remittances by investigating how export revenue affects the aggregate amount of remittances sent by migrants from their host-countries. Furthermore, it examines the extent to which the volatility of export revenue influences the volatility of the amount of remittances sent by migrants back to their home-countries. The importance of studying the relationship between export revenue in migrants' host-countries and the amount of the remittances sent (as well as the relationship between the volatility of export revenue in migrants' host-countries and the volatility of the amount of the remittances sent) lies on the fact the trade sector, and particularly exporting firms in the host-countries are key providers of jobs that could benefit the migrants.

The empirical analysis has been conducted using 23 countries over the period 1975-2016. It has primarily used the fixed effects estimator and show evidence that higher export revenues induce higher amount of remittances sent by migrants to their home-countries. Furthermore, higher volatility of export revenue generates higher volatility of the amount of remittances sent.

The rest of the article proceeds in five Sections. Section 2 discusses the channels through which export revenue (and its volatility) could affect remittances sent (and their volatility). Section 3 lays out the different models that help address the issues at hand. Section 4 discusses the econometric strategy to estimate these models. Section 5 interprets the empirical results, while Section 6 concludes.

### **Theoretical discussion on the relationship between export revenue and remittances, as well as their volatility**

The channels through which export revenue (and export revenue volatility) could influence migrants' remittances sent (or the volatility of the amount of remittances sent) are straightforward. First, a rise in export revenue in migrants' host-countries suggests that domestic trading firms are experiencing a healthy order-book and higher profits. These could then them to hire additional workers, including migrants, and eventually pay them higher wages. Additionally, higher export revenue in the exporting sector of the economy could generate positive spillovers to other sectors (non-export sectors) of the



economy (Grossman and Helpman, 1991) (for example in the form of efficient management and adoption of better production techniques for both the export and non-exporting sectors) and also results in higher jobs and/or higher wages for migrants. Thus, an increase in export revenue for domestic trading firms in migrants' host-countries would likely induce higher jobs and/or higher wages for migrants. The latter would therefore have at their disposal higher financial resources, which could translate into higher amounts of remittances sent to their home-countries. Therefore, the question that arises from the previous arguments, and which needs to be addressed is how immigration could affect export performance (export revenue) in countries of destination of migrants, which in turn could influence remittances sent by these migrants to their home-countries. Existing studies on the relationship between migration and international trade tend to report a positive effect of international migration on international trade. From the theoretical perspective, the effect of migration on international trade could take place through many channels, including the institutional quality in the migrants' countries of origin and the information costs. As for the institutional quality channel, Greif (1989; 1993) and Rauch (2001) have shown theoretically that by threatening to impose informal sanctions through the community, ethnic networks could contribute to enforcing trade contracts, and hence promoting international trade. In this context, migrant networks could help compensate for the adverse effects of weak institutions in their countries of origin on trade between their host countries and their countries of origin. This argument is consistent with that of other studies (e.g., Anderson and Marcouiller, 2002; Berkowitz et al. 2006) that have shown the relevance of institutional mechanisms for settling possible disputes among traders and enforcing contract, for the promotion of international trade. From an empirical perspective, few studies have examined the relevance of this channel. For example, Dunlevy (2006) has shown for American states that a high level of corruption in the migrant's countries of origin is associated with higher bilateral exports of these states. In the same vein, Briant et al. (2009) have demonstrated empirically for French regions that the lower the institutional quality in countries of origin of migrants, the higher is the magnitude of the positive effect of the migrant networks on exports from these regions. With regard to the informational costs channel, the theoretical literature has shown that migrant networks could help traders in countries of destination to obtain information on network risks or business opportunities and facilitate the connections between traders in migrants' countries of origin and their countries of destination. Empirical work in support for this argument include Head and Ries (1998), Rauch and Casella

(2003), Combes et al. (2005), and Felbermayr and Toubal (2012). In addition, cultural distance between the countries of origin of migrants and their countries of destination has been emphasized in the literature as an important contributor to higher information costs, including trade costs. Dunlevy (2006) has obtained for the US that immigration exerts a higher effect on trade between the foreign born and the natives when the 'language distance' is high. Along the same lines, Tadesse and White (2010) have shown that migrants residing in the US help mitigate the adverse effect of cultural distance on the US trade with migrants' countries of origin.

Overall, as far as the effect of migration on trade performance of developed countries (destination of migrants) is concerned, a number of studies have reported a positive and significant effect. These include for example, Gould (1994), Head and Ries (1998), Girma and Yu (2002), Murat and Pistorresi (2009), Briant et al. (2009), Peri and Requena-Silvente (2010), Hiller (2011), and Bastos and Silva (2012) respectively for the United States, Canada, the United Kingdom, Italy, French regions, Spain, Denmark, and Portugal. In addition, Parson (2012) has reported a positive effect of migration on northern exports to the South.

Irrespective of its direct effect on migrants' jobs and/or wages, export revenue could also indirectly contribute to improving migrants' financial situation in their host-countries through their effects on economic growth. The positive effect of exports on economic growth could take place through several channels, including higher factor productivity, an increase in available foreign exchange, positive externalities for the non-export sector in the form of knowledge spillovers (in the form for example of efficient management and adoption of better production techniques for both the export and non-export sectors), which would lead to innovation, drive production in all sectors, increase income, and ultimately promote economic growth (Edwards, 1993; Greenaway et al. 1999; Grossman and Helpman, 1991; Xu, 2000; Falk, 2009). Significant positive externalities deriving from competition in international trade markets could also accrue to the exporting country. These include increasing returns to scale, learning spillovers, increased innovation, as well as other efficiency gains. All these could also contribute to improving economic growth in the exporting country (e.g., Crespo-Cuaresma and Worz, 2005). Higher economic growth, thanks to higher export revenue could, in turn, generate jobs opportunities and/or wages increases for people, including migrants in the host-countries of migrants.



Overall, we expect that higher export revenue in the migrants' host countries would generate higher amount of remittances sent to their home countries. Similarly, we also expect that the volatility in export revenue would reduce jobs and/or reduce opportunities for wages rises for migrants, given that exporting firms would be less reluctant to hire workers (or may even lay off) due to the uncertainty associated with their profits from exporting to international trade markets.

### **Model specification**

To recall, the purpose of the analysis is two-fold: first, it assesses the effect of export revenue in donor-countries (developed countries) on remittances sent from these countries. Second, it examines the effect of export revenue volatility on the volatility of remittances sent.

### **Model specification on the impact of export revenue on remittances**

To investigate empirically how export revenue in migrants' host-countries influences the aggregate amount of remittances sent from these countries, we postulate the following model:

$$\begin{aligned} \log(REMIT)_{it} = & \alpha_0 + \alpha_1 \log(EXPORT)_{it} + \alpha_2 \log(GDPC)_{it} + \\ & \alpha_3 \log(UR)_{it} + \alpha_4 \log(FINDEV)_{it} + \alpha_5 \log(REER)_{it} + \alpha_6 \log(POP)_{it} + \mu_i + \\ & \omega_{it} \end{aligned} \quad (1)$$

where  $i$  is the subscript associated with a country;  $t$  denotes the time-period. The panel dataset used in the analysis contains 23 countries over the annual period 1975-2016. In particular, we use non-overlapping sub-periods of 5-year average data, which include 1975-1979; 1980-1984; 1985-1989; 1990-1994; 1995-1999; 2000-2004; and 2 non-overlapping sub-period of 6-year average, i.e., 2005-2010 and 2011-2016. The period has been chosen on the basis of data availability.  $\alpha_0$  to  $\alpha_6$  are parameters to be estimated.  $\mu_i$  are countries' fixed effects;  $\omega_{it}$  is a well-behaving error term.

The dependent variable "REMIT" represents the real values of remittances paid, i.e., sent from developed countries. The variable of key interest is the real export revenue (in constant values). The source and description of these two variables, as well as other variables in model (1) are provided in Appendix 1. Control variables include the real per capita income ("GDPC") of a donor-country; the depth of financial development ("FINDEV") in a donor-country; the real effective exchange rate ("REER") prevailing in a donor-country; the unemployment rate ("UR") in a donor-country; and the size of the population of a donor-country. The standard descriptive statistics on these variables are reported in Appendix 2. The list of countries used in the analysis is displayed in Appendix 3.

The left-hand side of Figure 1 provides the correlation pattern between the variables EXPORT and REMIT (both expressed in Logs),

and clearly shows export revenue is positively correlated with remittances paid.

The real per capita income reflects the economic wealth of the migrants' host country. Following the literature on the macroeconomic determinants of remittances (e.g., El-Sakka & McNabb, 1999; Freund and Spatafora, 2005; Gupta, 2005; Schiopu and Siegried, 2006; Chami et al, 2008; Adams, 2009), we expect that higher real per capita income would be associated with higher amounts of remittances paid. Likewise, a level of financial development in the host-country of migrants would lead to higher flows of remittances sent from migrants' host countries to their home-countries. As for the real effective exchange rate, we expect that an appreciation of the real effective exchange rate (for an unchanged value of nominal remittances) would be associated with a rise in the real value of remittances sent from donor-countries. On the other hand, given a depreciation level of the real effective change rate, migrants may decide to send to their home countries a higher amount of nominal remittances so that the real (net) value of remittances sent could result in higher remittances. Overall, it is difficult to anticipate the impact of the real effective exchange rate on remittances paid. We also expect that higher unemployment rates would reduce the chances for migrants to find a job in their host country, and the amount of remittances that they can send back to home would likely diminish. Concerning the size of population, we argue that a higher population size reflects a greater supply side (see Berthélemy et al., 2009), and hence the chance for migrants to find jobs, and send remittances back to their home countries. As a result, we expect a rise in the population size in donor-countries would likely be associated with higher remittances paid.

### **Model specification on the impact of the volatility of export revenue on the volatility of remittances paid**

We examine empirically the effect of export revenue volatility on the volatility of remittances paid by postulating the following model (2):

$$\begin{aligned} \text{Log}(REMITVOL)_{it} = & \beta_0 + \beta_1 \text{Log}(EXPORTVOL)_{it} + \beta_2 \text{Log}(GDPCVOL)_{it} + \\ & \beta_3 \text{Log}(GDPC)_{it} + \beta_4 \text{Log}(UR)_{it} + \beta_5 \text{Log}(REERVOL)_{it} + \beta_6 \text{Log}(POP)_{it} + \delta_i + \\ & \varepsilon_{it} \end{aligned} \quad (2)$$

where  $i$  is the subscript associated with a country;  $t$  denotes the time-period.  $\beta_0$  to  $\beta_6$  are parameters to be estimated.  $\delta_i$  are countries' fixed effects;  $\varepsilon_{it}$  is a well-behaving error term. We use the same dataset as for model (1), in particular 23 countries over the annual period 1975-2016. We also use the non-overlapping sub-periods (1975-1979; 1980-1984; 1985-1989; 1990-1994; 1995-1999; 2000-2004; 2005-



2010; and 2011-2016) to compute the volatility variables. The list of countries used in the analysis is displayed in Appendix 3, while the standard descriptive statistics on these variables are reported in Appendix 4.

Specifically, the dependent variable "REMITVOL" is the volatility in remittances paid and has been calculated as the standard deviation of the annual growth of the real values of remittances over each of the non-overlapping sub-periods. Similarly, the variable "EXPORTVOL", which captures the volatility of the real export revenue, has been calculated as the standard deviation of annual export revenue growth over each of the overlapping sub-periods. Finally, the volatility of the real effective exchange rate (denoted "REERVOL") has been calculated as the standard deviation of annual growth rate of the real effective exchange rate over each of the non-overlapping sub-periods. The volatility of the economic growth rate (denoted "GRVOL") is calculated as the standard deviation of annual growth rate of the real GDP over each of the non-overlapping sub-periods. The right-hand side of Figure 1 displays the correlation pattern between the variables EXPORTVOL and REMITVOL (both in Logs), and clearly shows that the volatility in export revenue is positively correlated with the volatility in remittances paid.

We expect export revenue volatility to result in lower jobs creation by trading firms, and/or lower wages for these firms' employees. As a consequence, migrants would experience uncertainty with respect to their job situation, including the salaries that they gain. The consequences of all these would be the volatility of remittances that migrants would send to their home countries. The same reasoning applies to the economic volatility (i.e., the volatility of growth rate of the real GDP). The volatility of the real effective exchange rate would introduce uncertainty about the evolution of the real effective exchange rate and result in fluctuations of the real values of remittances sent by migrants from their host countries. Incidentally, we expect higher unemployment rate in the migrants' host country would result in lower remittances and hence in the fluctuations of the amount of remittances sent to their home countries. As a result, higher unemployment rate would generate higher remittances volatility. The variable "GDPC" has been introduced in the model to capture the development level (economic wealth) of host-countries of migrants. As also noted above, the variable capturing the population size has been introduced in model (2) to capture the supply side, and hence the chance for migrants to find jobs, and send remittances back to their home countries.

### **Econometric strategy**

We estimate models (1) and (2) by means of the within fixed effects estimator where standard errors are corrected using the Driscoll and Kraay (1998) technique to account for heteroscedasticity, serial correlation and contemporaneous cross-sectional dependence in the dataset. We henceforth refer to this estimator as "FE-DK". Against this background, the empirical analysis proceeds as follows.

- First, we estimate model (1) by means of the FE-DK estimator. The results of this estimation are reported in column [1] of Table 1. To check the robustness of these results, in particular the result associated with the variable "EXPORT", we consider a variant of model (1), which consists of a dynamic specification of this model in which we introduce the one-period lag of the dependent variable as a regressor. As the estimation of this dynamic specification of model (1) by the FE-DK would result in biased estimates due to Nickell bias (Nickell, 1981), we use the Least Squares Dummy Variables Corrected (LSDVC) estimator proposed by Kiviet (1995), Judson and Owen (1999), Bun and Kiviet (2003), and extended by Bruno (2005). This estimator has been developed for unbalanced panel data, and corrects the bias associated with the estimation of dynamic models by means of the fixed effects estimator. It particularly requires that all regressors be exogenous. However, its main limitation is that the estimated asymptotic standard errors may provide poor approximations in small samples, possibly generating unreliable t-statistics. The procedure of the LSDVC involves the initialization by a consistent estimator to make the correction feasible, as the bias approximation depends on the unknown population parameters. To estimate the dynamic specification of model (1) by means of the LSDVC estimator, we initialize the bias correction by the Arellano and Bond estimator. Additionally, to correct for the sample bias, we bootstrapped standard errors. The outcome of the estimation of the dynamic specification of model (1) is reported in column [2] of Table 1.

- Second, we estimate model (2) by means of the FE-DK, and report in Table 2 the outcome of this estimation.

### **Interpretation of empirical results**

Results in column [1] of Table 1 indicate that export revenue exerts a positive and significant impact (at the 1% level) on the flows of remittances sent. In particular, a 1 percentage increase in the export revenue induces a 1.2 percentage increase in the aggregate amount of remittances sent. Likewise, results in column [2] show the existence of a state dependence path in the amount of remittances paid, as the coefficient associated with the one-period lag of the variable





"REMIT" is positive and statistically significant at the 1% level: the amount of remittances paid in period  $t-1$  is positively associated with amount of remittances paid in the current period. However, even if we control for the one-period lag of the dependent variable in model (1), the result in column [2] associated with the impact of export revenue on remittances sent appears to be similar (in magnitude, sign and statistical significance) to the one obtained in column [1]. In particular, here, a 1 percentage change in export revenue is associated with a 1.3 percentage increase in the amount of remittances paid. Concerning control variables, we find similarities between results in columns [1] and [2]. Given the possible bias that the LSDVC could introduce in small sample, and in light of the fact the results associated with the impact of export revenue on remittances sent are similar in columns [1] and [2], we will rely for the rest of the analysis on the static model (1). In other words, model (1) as it stands, would constitute our baseline model. Focusing then on estimates related to controls reported in column [1] of Table 1, we note that higher real per capita income, and the appreciation of the real effective exchange rate exert a positive and significant impact on the amount of remittances paid. The size of the population influences negatively and significantly remittances paid, which may reflect the fact that a higher population size makes it difficult for migrants to find jobs and hence be able to send remittances to their home countries. At the same time, the unemployment rate and the level of financial development do not exert a significant impact (at the 10% level) on the amount of remittances paid.

Let us now turn to results reported in Table 2. Results in column [1] of this Table indicate a positive and significant coefficient of the variable "EXPORTVOL" (in Logs). This signifies that export revenue volatility induces higher volatility of the amount of remittances paid. Specifically, a 1 percentage increase in the volatility of export revenue is associated with a 0.5 percentage increase in the volatility of the flows of remittances sent. Estimates related to control variables suggest that among all controls, only two are statistically significant at least at the 10% level. In particular, we find that while the volatility of the real effective exchange rate generates a higher volatility of remittances sent, a rise in the population size reduces the volatility of remittances.

## **Conclusion**

This article examines the extent to which export revenue matters for remittances sent from migrants' host-countries, notably developed countries. In particular, it uses a sample of 23 developed countries (which are known to be key host-countries for migrants) over the

period 1975-2016 to investigate whether export revenue matters for the amount of remittances sent by migrants from these countries. Additionally, it explores whether the volatility of export revenue influences the volatility of the amount of remittances sent. The findings indicate that higher export revenues are associated with higher amount of remittances sent by migrants to the home countries. Additionally, a rise in the volatility of export revenue translates into a higher volatility of the amount of remittances sent.

The policy implication of this analysis is that trade, in particular export flows do matter for the aggregate amount of remittances sent by migrants to their home countries. This suggests that ensuring a predictable environment for the development of exports in developed countries matters significantly for the amount of remittances sent by migrants to their home countries. Furthermore, policies that would help dampen the volatility of export revenue would also help avoid significant volatility of the amount of remittances sent. This is because volatility in the amount of the remittances sent could have adverse impacts on recipient-households' consumption and investments in social needs, such as education and health. Furthermore, it could also affect investments by recipients if part of the remittances helps set up businesses and develop entrepreneurship in the recipient-countries.

This analysis therefore highlights the importance of trade, notably exports in the migrants' host-countries for the amount of remittances that they sent to their home-countries. In particular, improving the business environment for exporting firms in the migrants' host-countries and devising domestic policies that help reduce the volatility of export revenue would allow migrants to send important amount of remittances to their home-countries.

## References

- Adams JR, R.H. (2009). The Determinants of International Remittances in Developing Countries. *World Development*, 37(1), 193-103. <https://doi.org/10.1016/j.worlddev.2007.11.007>
- Anderson, J. E. and Marcouiller, D. (2002). Insecurity and the Pattern of Trade: An Empirical Investigation. *The Review of Economics and Statistics*, 84(2), 342-352. <https://doi.org/10.1162/003465302317411587>
- Bastos, P. and Silva, J. (2012). Networks, Firms, and Trade. *Journal of International Economics*, 87(2), 352-364. <https://doi.org/10.1016/j.jinteco.2011.12.011>
- Berkowitz, D., Moenius, J., and Pistor, K. (2006). Trade, Law, and Product Complexity. *The Review of Economics and Statistics*, MIT Press, 88(2), 363-373. <https://doi.org/10.1162/rest.88.2.363>



- Berthélemy J.-C., Beuran M. and Maurel, M. (2009). Aid and Migration: Substitutes or Complements? *World Development* 37(10), 1589-1599. <https://doi.org/10.1016/j.worlddev.2009.02.002>
- Briant, A., Combes, P.P., and Lafourcade, M. (2009). Product Complexity, Quality of Institutions and the Pro-Trade Effect of Immigrants. CEPR Discussion Papers, 7192, Paris.
- Bruno, G. (2005). Approximating the bias of the LSDV estimator for dynamic unbalanced panel data models, *Economics Letters*, 87, 361-366. <https://doi.org/10.1016/j.econlet.2005.01.005>
- Bun, M. J. G. and Kiviet, J. F. (2003). On the diminishing returns of higher-order terms in asymptotic expansions of bias, *Economics Letters*, 79, 145-152. [https://doi.org/10.1016/S0165-1765\(02\)00299-9](https://doi.org/10.1016/S0165-1765(02)00299-9)
- Chami R., Barajas, A., Cosimano, T., Fullenkamp, C., Gapen, M., and Montiel, P. (2008). *Macroeconomic Consequences of Remittances*, IMF Occasional Paper No. 259 (Washington: International Monetary Fund).
- Combes, P.-P., Lafourcade, M. and Mayer, T. (2005). The Trade-Creating Effects of Business and Social Networks: Evidence from France. *Journal of International Economics*, 66(1), 1-29. <https://doi.org/10.1016/j.jinteco.2004.07.003>
- Crespo-Cuaresma, J. and Worz, J. (2005). On export composition and growth. *Weltwirtschaftliches Archiv*, 141, 33-49. <https://doi.org/10.1007/s10290-005-0014-z>
- Driscoll J. C., and Kraay A.C. (1998). Consistent Covariance Matrix Estimation with Spatially Dependent Panel Data. *Review of Economics and Statistics*, 80(4): 549-560. <https://doi.org/10.1162/003465398557825>
- Dunlevy, J. A. (2006). The Influence of Corruption and Language on the Pro-Trade Effect of Immigrants: Evidence from the American States. *The Review of Economics and Statistics*, 88(1), 182-186. <https://doi.org/10.1162/003465306775565792>
- Edwards, S. (1993). Openness, trade liberalization, and growth in developing countries. *Journal of Economic Literature*, 31, 1358-1393.
- El-Sakka, M. I. T., and McNabb, R. (1999). The Macroeconomic Determinants of Emigrant Remittances. *World Development*, 27(8), 1493-1502. [https://doi.org/10.1016/S0305-750X\(99\)00067-4](https://doi.org/10.1016/S0305-750X(99)00067-4)
- Falk, M. (2009). High-tech exports and economic growth in industrialized countries. *Applied Economics Letters*, 16(10), 1025-1028. <https://doi.org/10.1080/13504850701222228>
- Felbermayr, G. J., and Toubal, F. (2012). Revisiting the Trade-Migration Nexus: Evidence from New OECD Data. *World Development*, 40(5), 928-937. <https://doi.org/10.1016/j.worlddev.2011.11.016>
- Freund C., and Spatafora, N. (2005). Remittances, Transaction Costs, Determinants, and Informal Flows. *World Bank Policy Research Working Paper*, 3704. <https://doi.org/10.1596/1813-9450-3704>
- Girma, S., and Yu, Z. (2002). The Link between Immigration and Trade: Evidence from the United Kingdom. *Review of World Economics*, 138(1), 115-130. <https://doi.org/10.1007/BF02707326>
- Gould, D. M. (1994). Immigrant Links to the Home Country: Empirical Implications for U.S. Bilateral Trade Flows. *The Review of Economics and Statistics*, 76(2), 302-316. <https://doi.org/10.2307/2109884>

- Greenaway, D., Morgan, W., and Wright, P. (1999). Exports, export composition and growth. *The Journal of International Trade and Economic Development*, 8, 41-51. <https://doi.org/10.1080/09638199900000004>
- Greif, A. (1989). Reputation and Coalition in Medieval Trade: Evidence on the Maghribi Traders. *Journal of Economic History*, 49, 857-882. <https://doi.org/10.1017/S0022050700009475>
- Greif, A. (1993). Contract Enforceability and Economic Institutions in Early Trade: The Maghribi Traders' Coalition. *American Economic Review*, 83, 525-548.
- Grossman, G.M. and Helpman, E. (1991). *Innovation and Growth in the Global Economy*. Cambridge: The MIT Press.
- Gupta, P. (2005). Macroeconomic Determinants of Remittances: Evidence from India. IMF Working Paper No. 05/224, International Monetary Fund, Washington, D.C. <https://doi.org/10.5089/9781451862430.001>
- Head, K., and Ries, J. (1998). Immigration and Trade Creation: Econometric Evidence from Canada. *The Canadian Journal of Economics*, 31(1), 47-62. <https://doi.org/10.2307/136376>
- Hiller, S. (2011). Does Immigrant Employment Matter for Exports? Evidence from Denmark. Aarhus University, Working Paper 11-16, Denmark.
- Judson, R. and Owen, A. (1999). Estimating dynamic panel data models: a guide for macroeconomists, *Economics Letters*, 65, 9-15. [https://doi.org/10.1016/S0165-1765\(99\)00130-5](https://doi.org/10.1016/S0165-1765(99)00130-5)
- Kiviet, J. (1995). On bias, inconsistency, and efficiency of various estimators in dynamic panel data models, *Journal of econometrics*, 68, 53-78. [https://doi.org/10.1016/0304-4076\(94\)01643-E](https://doi.org/10.1016/0304-4076(94)01643-E)
- Murat, M., and Pistoresi, B. (2009). Migrant Networks: Empirical Implications for the Italian Bilateral Trade. *International Economic Journal*, 23(3), 371-390. <https://doi.org/10.1080/10168730903119435>
- Parsons, C. R. (2012). Do Migrants Really Foster Trade? The Trade-Migration Nexus, A Panel Approach 1960-2000. World Bank Policy Research Working Paper No. 6034, Washington, D.C. <https://doi.org/10.1596/1813-9450-6034>
- Peri, G., and Requena-Silvente, F. (2010). The Trade Creation Effect of Immigrants: Evidence from the Remarkable Case of Spain. *Canadian Journal of Economics*, 43(4), 1433-1459. <https://doi.org/10.1111/j.1540-5982.2010.01620.x>
- Rauch J. E., and Casella, A. (2003). Overcoming Informational Barriers to International Resource Allocation: Prices and Ties. *Economic Journal*, 113 (484), 21-42. <https://doi.org/10.1111/1468-0297.00090>
- Rauch, J. E. (2001). Business and Social Networks in International Trade. *Journal of Economic Literature*, 39(4), 1177-1203. <https://doi.org/10.1257/jel.39.4.1177>
- Schiopu, I., and Siegfried, N. (2006). Determinants of Workers' Remittances: Evidence for the European Neighbouring Region. European Central Bank Working Paper Series 688.
- Tadesse, B., and White, R. (2010). Cultural Distance as a Determinant of Bilateral Trade Flows: Do Immigrants Counter the Effect of Cultural Differences? *Applied Economics Letters*, 17(2), 147-152. <https://doi.org/10.1080/13504850701719983>



Xu, Z. (2000). Effects of primary exports on industrial exports and GDP: Empirical evidence. *Review of Development Economics*, 4, 307-325  
<https://doi.org/10.1111/1467-9361.00097>.

**TABLES and APPENDICES****Table 1:** Impact of export revenue on the remittances paid

Estimators: FE-DK and LSDVC (Bias correction initialized by Arellano and Bond estimator) with bootstrapped standard errors

	<b>FE-DK</b>	<b>LSDVC</b>
<b>VARIABLES</b>	<b>Log(REMIT)</b>	<b>Log(REMIT)</b>
	(1)	(2)
Log(REMIT) <sub>t-1</sub>		0.495*** (0.0656)
Log(EXPORT)	1.238*** (0.0897)	1.321*** (0.209)
Log(GDPC)	2.480*** (0.188)	1.119* (0.571)
Log(UR)	-0.0167 (0.0301)	2.951*** (0.927)
Log(FINDEV)	0.00875 (0.0557)	0.0550 (0.0456)
Log(REER)	0.712** (0.287)	1.376*** (0.433)
Log(POP)	-2.976*** (0.350)	-3.142*** (0.982)
Constant	9.520** (4.357)	
Observations - Countries	103 - 23	97 - 23
Within R-squared	0.8046	

Note: \*p-value<0.1; \*\*p-value<0.05; \*\*\*p-value<0.01. Robust Standard Errors are in parenthesis.

**Table 2:** Impact of export revenue volatility on the volatility of remittances paid

Estimator: FE-DK

<b>VARIABLES</b>	<b>Log(REMITVOL)</b>
	(1)
Log(EXPORTVOL)	0.531*** (0.168)
Log(GDPC)	-0.121 (0.344)
Log(UR)	-0.111 (0.206)
Log(GRVOL)	0.0153 (0.0383)
Log(REERVOL)	0.236*** (0.0597)
Log(POP)	-1.597** (0.686)
Constant	28.99*** (7.971)
Observations - Countries	145 - 23
Within R-squared	0.1120

Note: \*p-value<0.1; \*\*p-value<0.05; \*\*\*p-value<0.01. Robust Standard Errors are in parenthesis.



**APPENDICES****Appendix 1:** Definitions and sources of variables

Variable	Definition	Source
REMIT	Real Personal remittances paid (in constant values). It has been calculated as the personal remittances in current US dollars, deflated by the United States Consumer Price Index for All Urban Consumers.	Author's calculation based on data on Personal remittances, paid (current US\$) collected from the World Development Indicators (WDI). Data on the United States Consumer Price Index for All Urban Consumers are collected from online at: <a href="https://fred.stlouisfed.org">https://fred.stlouisfed.org</a>
EXPORT	Real Export values (in constant values). It has been calculated as the exports of goods and services in current US dollars, deflated by the United States Consumer Price Index for All Urban Consumers.	Author's calculation based on data on exports of goods and services (current US\$) extracted from the WDI. Data on the United States Consumer Price Index for All Urban Consumers are collected from online at: <a href="https://fred.stlouisfed.org">https://fred.stlouisfed.org</a>
GDP	GDP per capita (constant 2010 US\$)	WDI
FINDEV	Domestic credit to private sector (% of GDP)	WDI
REER	Real effective exchange rate index	WDI
POP	Total population	WDI
UR	Unemployment Rate (%)	Organization for Economic Cooperation and Development (OECD) Economic Outlook.

**Appendix 2:** Descriptive statistics on variables used in model (1)

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
REMIT	170	2.13e+07	3.80e+07	42076.34	2.47e+08
EXPORT	184	1.22e+09	1.49e+09	1.18e+07	9.59e+09
GDP	183	38557.2	16767.96	11168.43	105798.9
FINDEV	116	280.007	1920.101	19.09909	20775.63
REER	173	99.900	13.25471	73.4586	138.941
UR	172	6.696	3.648	0.401	24.110
POP	184	3.60e+07	5.84e+07	221840.8	3.17e+08

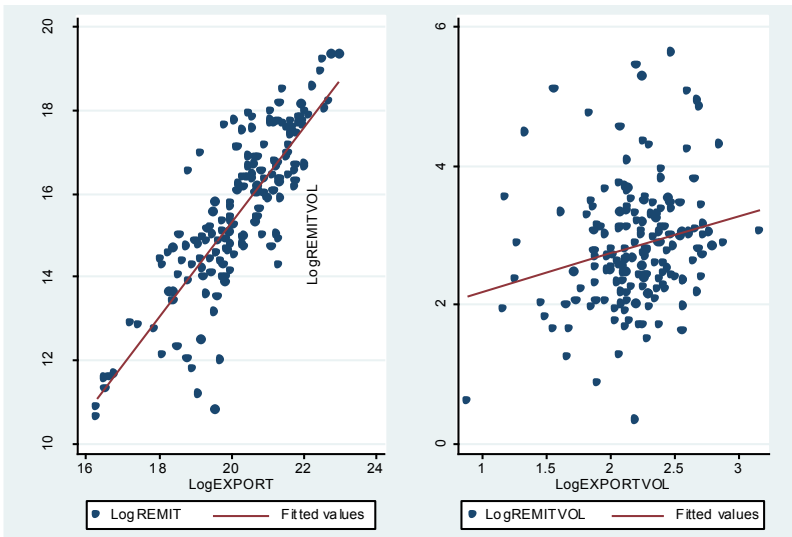
**Appendix 3:** List of countries contained in the Entire Sample

Entire Sample	
Australia	Japan
Austria	Luxembourg
Belgium	Netherlands
Canada	New Zealand
Denmark	Norway
Finland	Portugal
France	Spain
Germany	Sweden
Greece	Switzerland
Iceland	United Kingdom
Ireland	United States
Italy	

**Appendix 4:** Descriptive statistics on variables used in model (2)

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
REMITVOL	169	26.864	38.263	1.411	277.112
EXPORTVOL	184	9.410	3.111	2.443	23.648
GRVOL	183	1.920	1.182	0.255	9.324
REERVOL	161	4.290	2.456	0.567	14.108
GDP	183	38557.200	16767.960	11168.430	105798.900
UR	172	6.696	3.648	0.401	24.110
POP	184	3.60e+07	5.84e+07	221840.8	3.17e+08

**Figure 1:** Correlation Pattern between Export Revenue (and its Volatility) and Remittances Paid (and its Volatility)



Source: Author

