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Effect of Economic Uncertainty on Remittances Flows from Developed Countries

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Abstract

This article has investigated the effect of economic uncertainty on the remittances sent by migrants residing in developed countries to their home countries. The analysis builds on the economic uncertainty index developed by Ahir et al. (2018, 2019, 2022) that reflects the uncertainty related to economic and political events, regarding both near-term and long term concerns. It has revealed that economic uncertainty has deleterious effects on remittances outflows from developed countries, especially when it reaches high levels. This finding indicates that developing countries will suffer from reduced remittances inflows if the current fragmentation of the world were to become protracted, and result in higher barriers to the movement of capital and people.

Keywords: Economic Uncertainty; Remittances Outflows; Developed Countries.

JEL Classification: E30; F24.

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1. Introduction

The world is confronted with multiple crises that result in an increasingly fragmented world. The resulting geoeconomic fragmentation² has a major bearing on developing economies, including by virtue of their connections with advanced economies through *inter alia*, trade, finance and migration (e.g., Aiyar et al., 2023; IMF, 2023a, 2023b; UNCTAD, 2023; World Bank, 2023; WTO, 2023). In particular, remittances flows from to developing countries, including those from developed countries are critical for these countries' economic growth and development (e.g., Bettin et al., 2017; Combes et al., 2012; Chami et al., 2005; 2012; Lim et al., 2023; Mishra et al., 2022; Mora-Rivera and van Gasteren, 2021; Yang and Choi, 2007). According to Ratha (2023), remittances flows to Low and middle income countries (LMICs) increased by 8 percent (reaching \$647 billion) in 2022, and are expected to grow by 1.4 percent in 2023, resulting in total inflows of \$656 billion. At a larger scale, remittances flows to the world are expected to reach \$840 billion in 2023, and to increase by \$18 billion (i.e., a growth rate of 2 per cent) in 2024. These capital flows remain a major source of external finance for developing countries, as in 2022, remittances flows to LMICs surpassed foreign direct investment (FDI) inflows, official development assistance (ODA) inflows, and portfolio investment inflows (e.g., Ratha et al. 2023: p1).

The effect of economic uncertainty on remittances outflows from developed countries is at the heart of the present study. To the best of our knowledge, this is the first study on the relationship between economic uncertainty³ and remittances outflows. Abel (1983) has defined economic uncertainty as unexpected changes that affect the economic ecosystem, and how changes in fiscal or monetary policies or any other government policies affect corporations. Ahir et al. (2018, 2019, 2020, 2022) have defined uncertainty (that we refer here to as 'economic uncertainty') as the uncertainty related to economic and political events, regarding both near-term and long term concerns. On the basis of this definition, the authors have computed an index of economic uncertainty, referred to as "world uncertainty index", that is comparable across countries and that captures the frequency of the world "uncertainty" (or its variant) in Economist Intelligence Unit (EUI) country reports. The raw counts have then been scaled by the total number of words in each report, that is, the number of "uncertainty" words per thousand words. An increase in the values of this index for a given country, reflects greater economic uncertainty. Ahir et al. (2022) have shown that the world uncertainty index is associated with an increase in the economic policy uncertainty developed by Baker et al. (2016), greater stock market volatility, and

² Geoeconomic fragmentation is a policy-driven reversal of integration, often guided by strategic considerations (Aiyar et al., 2023).

³ Al-Thaqeb and Algharabali (2019) have provided a literature survey on the effects of economic uncertainty.

forecaster disagreement, and lower GDP growth. Additionally, it tends to rise close to political elections.

While some works have investigated the macroeconomic determinants of remittances flows that accrue to developing countries⁴, only few studies have considered the macroeconomic determinants of remittances outflows from developed countries (e.g., Gnanon, 2018; 2019; 2021). The current study pertains to the latter strand of the literature. It builds on these studies and uses the world uncertainty index of Ahir et al. (2018, 2019, 2020, 2022) to examine how economic uncertainty affects the amounts of money sent by migrants residing in developed economies.

Bloom (2014) has argued that fluctuations in uncertainty often make firms reluctant to make essential or costly decisions in unpredictable regulatory environments, and consequently reduce investment and job opportunities (see also Handley and Limão, 2017; Novy and Taylor, 2020). According to Aiyar et al. (2023), a protracted process of the fragmentation at the global level would lead to heightened uncertainty that would delay investment decisions and, adversely affect productivity and research and development activity. Uncertainty would also lead to higher precautionary savings as well as an increase in the demand for risk-free assets (e.g., Christelis et al., 2020). It reduces personal income for individuals and firms' profitability (e.g., Giglio et al., 2016) and subsequently delays their investment decisions (e.g., Al-Thaqeb and Algharabali, 2019; Baker et al., 2016), increases unemployment (e.g., Bernanke, 1983; Bonciani and Ricci, 2020), reduces employment growth (e.g., Hankins et al., 2022), reduces economic growth and ultimately affect negatively the whole economy (e.g., Balcilar et al., 2016; Bloom et al., 2007, 2012; Carriero et al., 2021; Dibiasi and Sarferaz, 2023). The uncertainty driven for example by geoeconomic fragmentation can result in higher trade costs (WTO, 2023) by driving-up prices of intermediates and final goods (e.g., Carroll and Hur, 2022; Fajgelbaum et al., 2019) - hence, making imports of goods and services more expensive - and limit access to a wide range of products to fit consumers' needs, preferences, and budget (e.g., Amiti et al. 2019).

On the basis of these findings in the literature, we posit that greater economic uncertainty in developed economies could exert adverse effects on remittance outflows from developed economies, especially when it exceeds a certain level. This is because in these circumstances, migrants residing in these countries (their host countries) could face reduced job opportunities, eventually lose their jobs and experience lower personal income not only owe to reduced salaries but also to higher prices of domestic and import products.

⁴ See for example, Abbas et al. (2017); Adams (2009); Chami et al. (2008); El-Sakka and McNabb (1999); Freund and Spatafora (2008) and Gupta (2005).

Against this backdrop, we submit the hypothesis that *greater economic uncertainty would lead to lower remittances outflows from developed economies, in particular if it exceeds a certain level.*

The empirical analysis relies on a panel dataset of 22 countries over the period from 1995 to 2020, and provides support for this hypothesis.

The rest of the analysis is structured around three sections. The next section (section 2) presents the model specification that serves to examine empirically the effect of economic uncertainty on remittances outflows from developed countries, and briefly discusses the econometric approach used to estimate this model. Section 3 interprets empirical outcomes, and section 4 concludes.

2. Model specification

The empirical model used to examine the effect of economic uncertainty on remittances outflows draws from previous works on the macroeconomic factors underpinning remittances flows to developing economies (e.g., Abbas et al. 2017; Adams, 2009; Chami et al. 2008; El-Sakka and McNabb, 1999; Freund and Spatafora, 2008; Gupta, 2005). It relies particularly on the recent works on the macroeconomic determinants of remittances outflows from developed economies (e.g., Gngangnon, 2018; 2019; 2021). Our main variable in the analysis is the indicator of economic uncertainty developed by Ahir et al. (2018, 2019, 2022). This indicator, denoted "WUI", is introduced in the empirical model along with its squared term to capture the eventual non-linear effect of economic uncertainty on remittances outflows from developed economies, henceforth referred to as "remittances outflows" for the sake of simplicity. The control variables used in the empirical model are mainly drawn from Gngangnon (2018; 2019; 2021) and include the total inflows of migrants in a given country (denoted "MIGRFL"), the degree of trade openness (denoted "OPEN"), the real per capita income - as a proxy for the level of development - (denoted "GDPC"), the real effective exchange rate (denoted "REER"), and the level of financial development (denoted "FD"). The dependent variable is denoted "REM" and represents the share of remittances outflows in GDP, expressed in percentage. The definition and source of all these variables have been provided in Appendix 1. For the sake of brevity, we refrain here from repeating the discussion on the theoretical effects of these variables, as such discussion has been provided in Gngangnon (2018; 2019; 2021). Therefore, for the discussion on the theoretical effects of these control variables, we refer readers to the papers by Gngangnon (2018; 2019; 2021) as well as to

other studies mentioned above concerning the macroeconomic determinants of remittances outflows.

In light of the foregoing, we postulate the following model (1).

$$REM_{it} = \theta_0 + \theta_1 WUI_{it} + \theta_2 WUI_{it}^2 + \theta_3 \text{Log}(MIGRFL)_{it} + \theta_4 \text{OPEN}_{it} + \theta_5 \text{Log}(GDPC)_{it} + \theta_6 \text{Log}(REER)_{it} + \theta_7 FD_{it} + \theta_8 DUMOUT_{it} + \gamma_t + \mu_i + \varepsilon_{it} \quad (1)$$

i and t are subscripts for a developed country, and a time-period. The dataset used in the analysis is unbalanced and contains 22 developed countries over the period 1995-2020. In view of this unbalanced nature of the dataset, we average data over non-overlapping sub-periods of 3-year that are 1995-1997; 1998-2000; 2001-2003; 2004-2006; 2007-2009; 2010-2012; 2013-2015; 2016-2018; 2019-2020 (this last sub-period covers only 2 years). This procedure helps mitigate the effect of business cycles on variables, and avoid issues of non-stationarity of variables. Appendix 2 contains the list of the 22 developed countries used in the analysis. Appendices 3a and 3b report respectively the standard descriptive statistics on variables, and the pairwise correlation among these variables. The latter indicates the absence of multicollinearity problems in the analysis.

θ_0 to θ_8 are coefficients that will be estimated. γ_t are time dummies that represent global shocks influencing simultaneously remittances outflows from all countries in the sample. μ_i stand for countries' time invariant specific effects, and ε_{it} is a well-behaving error term.

[Insert Figure 1, here]

We provide in Figure 1 the correlation pattern between the indicator of economic uncertainty and the share of remittances outflows in GDP. The right-hand side graph in this Figure shows a positive correlation between these two indicators, while the left-hand side graph indicates the existence of a non-linear relationship, possibly in the form of an inverted-U curve, between economic uncertainty and remittances outflows. In the meantime, outliers appear in these two graphs, and are captured in model (1) through a dummy variable (denoted "DUMOUT") that takes the value of 1 when the values of the variable "REM" exceed 2 per cent, and the value of 0, otherwise.

To choose the appropriate econometric approach to estimate model (1), we start by performing the Cluster-robust Hausman test of Kaiser (2015) that allows choosing between a fixed-effects model and a random effects model. The outcome of this test suggests a Chi-square statistic equal to 6.96 and an associated p-value equal to 0.433. This suggests that we could estimate model (1) using either the fixed-effects model specification or the random-effects model specification.

Using the fixed-effects model would suggest that we account only for the within-country variations of variables, and disregard the between-countries' variation of variables. This might not be necessarily the appropriate approach (e.g., Dieleman and Templin, 2014), especially when the within-country variation of variables is not sufficiently large to generate precise estimates. Yet, the random effects model could be the alternative option, but it rests on the assumption that there is no correlation between the unobserved country heterogeneity and regressors. In most cases, this assumption is not tenable as countries' unobserved characteristics are highly likely correlated with some regressors. As a result, a pure random effects model specification might not be the right option. Following the suggestion by authors such as Andress et al. (2013) and Wooldridge (2010), the random-effects Mundlak approach (Mundlak, 1978), also referred to as "correlated random effects model", could be a good candidate. It has the advantage of taking into account differences within and between-countries, and involves introducing in the random effects specification, both the time-invariant variables with the demeaned coefficients from the fixed-effects model. The vector of time-averaged regressors allows controlling for time-invariant unobserved heterogeneity (between-country effects) in the regressions. Hence, the coefficients θ_0 to θ_8 will reflect the within-effects estimates given that the averages of regressors across years and per country allow controlling for the between-effects in the regressions.

Overall, while our primary estimator used in the empirical analysis is the random-effects Mundlak approach (henceforth referred to as "RE-Mundlak" approach), we also present the outcomes of the estimation of model (1) based on the within fixed effects estimator (denoted FEDK). The latter is utilized along with the technique developed by Driscoll and Kraay (1998) that permits to obtain correct standard errors by accounting for the heteroscedasticity, serial correlation and contemporaneous cross-sectional dependence in the residuals.

Before estimating model (1) as it stands, we first estimate a specification of this model that does not contain the squared term of the variable "WUI", that is, the variable "WUI²". The results of this model specification using the FEDK and RE-Mundlak estimators are reported respectively in columns [1] and [2] of Table 1. Likewise, the estimates arising from the estimation of model (1) as it stands (i.e., with both "WUI" and its squared term) using the FEDK and RE-Mundlak estimators are presented in columns [3] and [4] of Table 1.

3. Results' interpretation

Results in columns [1] and [2] of Table 1 suggest that the coefficients of the variable "WUI" are positive and significant at the 1% level, and are identical although with different standard errors.

We may be tempted to conclude that greater economic uncertainty leads to higher remittances outflows. However, results in columns [3] and [4] indicate that the estimates associated with the variable "WUI" are positive and significant at the 1% level and identical yet but with different standard errors. Concurrently, the coefficients of the squared term of "WUI" (i.e., the estimate of "WUI²") are negative and significant at the 1% level (although with different standard errors). These latter outcomes show, in line with what we observed on the right-hand side graph of Figure 1, that there is a non-linear relationship in the form of an inverted-U curve, between economic uncertainty and remittances outflows. On average over the full sample, the value of the indicator of economic uncertainty above which greater economic uncertainty is negatively associated with remittances outflows amounts to 0.634 [= $1.294/(2*1.021)$], bearing in mind that the value of the indicator "WUI" range from 0.005 to 1.027 in the full sample (see Appendix 3a). This suggests that on average over the full sample, economic uncertainty affects positively remittances outflows provided that its level be comprised between 0.005 and 0.634, but it affects negatively remittances outflows when its level exceeds 0.634. In the latter case, the greater the economic uncertainty, the larger is its negative effect on remittances outflows. We illustrate this outcome graphically by providing in Figure 2, at the 95 per cent confidence intervals, the marginal impact of economic uncertainty on remittances outflows for varying degrees of economic uncertainty.

[Insert Figure 2, here]

We observe that economic uncertainty exerts a positive effect on remittance outflows when its level is lower than 0.577: in this case, the magnitude of this positive effect of remittances outflows on economic uncertainty decreases as economic uncertainty rises. In contrast, for degrees of economic uncertainty higher than 0.76, economic uncertainty affects negatively remittances outflows, and the higher the level of economic uncertainty, the larger is its negative effect on remittances outflows. Incidentally, economic uncertainty exerts no significant effect on remittances outflows when its level ranges⁵ from 0.577 to 0.76.

Overall, these findings support our hypothesis set out in section 1. We conclude that economic uncertainty is detrimental to remittances outflows, especially when it exceeds a certain threshold.

[Insert Table 1, here]

Results concerning control variables are consistent across the four columns of Table 1. Focusing on outcomes in columns [3] and [4], we observe that trade openness and greater financial development lead to higher remittances outflows, while remittances outflows tend to be larger in

⁵ It is important to note that the threshold values 0.577 and 0.76 are obtained from Figure 2.

less wealthier countries among developed countries (the coefficients of the real per capita income are negative and significant at the 1% level in columns [3] and [4]). On the other side, in line with Gnanon (2019), we obtain that an appreciation of the real exchange rate leads to higher remittances sent by migrants to their home countries. Without surprise, the coefficient of the dummy variable that captures outliers is positive and significant at the 1% level. Finally, we find almost no significant effect of the size of migrants inflows on remittances outflows.

4. Conclusion

This paper has examined the effect of economic uncertainty on remittances outflows from developed countries, that is, the amount of money sent by migrants residing in developed countries to their home countries. Economic uncertainty reflects here the uncertainty related to economic and political events, regarding both near-term and long term concerns (Ahir et al., 2018, 2019, 2022). The analysis has relied on 22 developed countries over the period from 1995 to 2020. The empirical work shows that economic uncertainty is positively associated with remittances outflows for moderate levels of economic uncertainty, although the magnitude of this positive effect diminishes as the level of economic uncertainty rises. However, for high levels of economic uncertainty, the latter affects negatively remittances outflows from developed countries.

Remittances inflows play a critical role for developing countries' economic growth and development. The outcomes of the present analysis suggest that developing economies would suffer from a deeper fragmentation of the world into economic blocs if this resulted in higher barriers to migration and to stronger capital controls.

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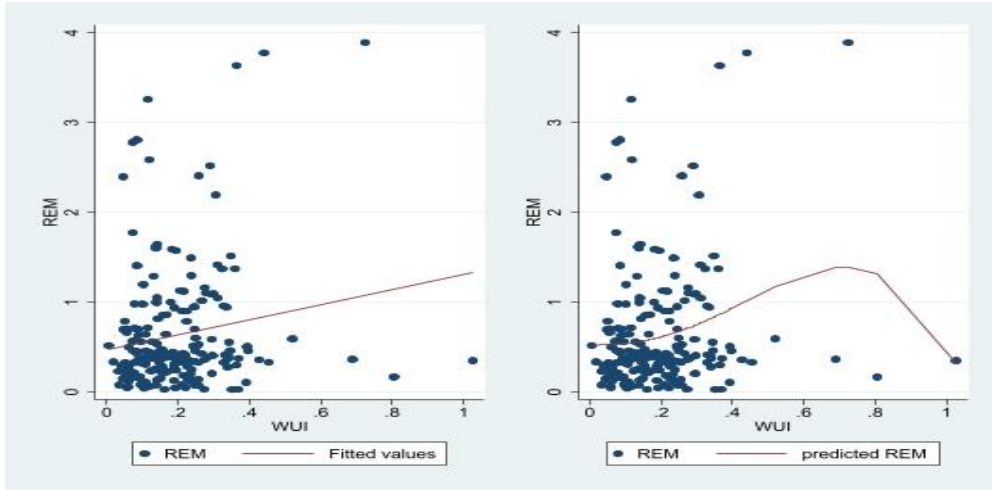
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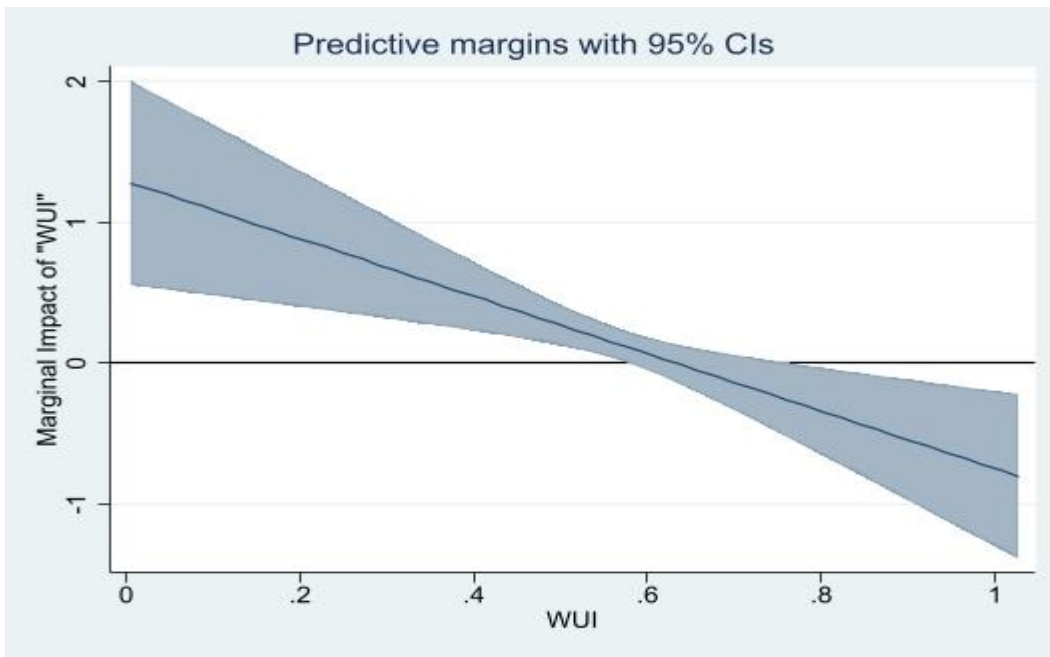
FIGURES

Figure 1: Correlation pattern between the world uncertainty index and the share of remittances outflows in GDP



Source: Author

Figure 2: Marginal Impact of "WUI" on "REM" for varying levels of WUI



Source: Author

TABLES and APPENDICES

Table 1: Effect of world uncertainty on remittances outflows
Estimators: FEDK and RE Mundlak

Variables	FEDK REM (1)	RE Mundlak REM (2)	FEDK REM (3)	RE Mundlak REM (4)
WUI	0.547*** (0.0694)	0.547*** (0.148)	1.294*** (0.373)	1.294*** (0.301)
WUI ²			-1.021*** (0.322)	-1.021*** (0.361)
Log(MIGRFL)	0.0853 (0.0951)	0.0853* (0.0453)	0.0630 (0.0839)	0.0630 (0.0451)
OPEN	0.00722*** (0.00138)	0.00722*** (0.00189)	0.00660*** (0.00160)	0.00660*** (0.00187)
Log(GDPC)	-0.732*** (0.249)	-0.732*** (0.250)	-0.690*** (0.229)	-0.690*** (0.246)
Log(REER)	0.921*** (0.117)	0.921*** (0.234)	0.848*** (0.158)	0.848*** (0.231)
Log(FD)	0.508*** (0.147)	0.508 (0.311)	0.533*** (0.148)	0.533* (0.304)
DUMOUT	0.504*** (0.153)	0.504*** (0.188)	0.500*** (0.141)	0.500*** (0.184)
Constant	2.110 (1.923)	-4.806 (4.559)	2.196 (2.202)	-4.903 (4.719)
Observations - Countries	195 - 22	195 - 22	195 - 22	195 - 22
Within R-squared	0.3507	0.3507	0.3807	0.3807
Between R-squared		0.9185		0.9192
Overall R-squared		0.8497		0.8540
F Statistic (P-Value)	2324.76 (0.0000)		4267.00 (0.0000)	
Wald Chi2 Statistic (P-Value)		247.45 (0.0000)		249.34 (0.0000)

Note: * p -value <0.1 ; ** p -value <0.05 ; *** p -value <0.01 . Robust standard errors are in parenthesis. The variable "DUMOUT" is a dummy that takes the value of 1 for outliers, and 0. Otherwise. Outliers have been identified here as instances where the values of the variable "REM" exceed 2 per cent.

Appendix 1: Definition and Source of variables

Variables	Definition	Source
REM	Share of remittances outflows in GDP.	World Development Indicators (WDI)
WUI	This is indicator of the aggregate world uncertainty index that measures trade uncertainty. The measure relies on reports that focus on economic policy and international events to apprehend the level of uncertainty in the economic conditions of a country. It captures uncertainty related to economic and political developments, regarding both near-term and long-term concerns (Ahir et al., 2018, 2019, 2022). The original data is available on a quarterly basis from 1952 onwards. For the sake of the analysis, we have computed annual data of the world uncertainty index using for every year, the average of data over the four quarters. Thus, the world uncertainty indicator is computed per country by counting the frequency of the world "uncertainty" (or its variant) in EIU country reports. The index has been normalized by the total number of words and rescaled by multiplying by 1,000. A higher value of this indicator means higher uncertainty, and vice versa.	See the database developed by Ahir et al. (2018) and accessible online at: https://worlduncertaintyindex.com/data/
GDPC	Real per capita Gross Domestic Product (constant 2015 US\$).	World Development Indicators (WDI)
MIGRFL	Total inflows of migrants to a given country.	Database of the Organisation for Economic Co-operation and Development (OECD). See the database online at: https://stats.oecd.org/
FD	This is the financial development index, which summarizes how developed financial institutions and financial markets are in terms of their depth (size and liquidity), access (ability of individuals and companies to access financial services), and efficiency (ability of institutions to provide financial services at low costs and with sustainable revenues, and the level of activity of capital markets). The values of this indicator range between 0 and 1.	Data extracted from the IMF Financial Development Index Database (see online at: https://data.imf.org/?sk=F8032E80-B36C-43B1-AC26-493C5B1CD33B) - See also Sahay et al. (2015).
OPEN	This is the ratio of the sum of a country's exports and imports of goods and services to its GDP (in percentage).	Author's calculation based on data extracted from the WDI.
REER	This the index measuring the Real Effective Exchange Rate. The REER index 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 exchange rate, i.e., an appreciation of the home currency against the basket of currencies of trading partners.	Bruegel Datasets (see Darvas (2012a, 2012b)). The dataset could be found online at: http://bruegel.org/publications/datasets/real-effective-exchange-rates-for-178-countries-a-new-database/

Appendix 2: List of countries contained in the full sample

Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Israel, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States.

Appendix 3a: Standard descriptive statistics on variables

Variable	Observations	Mean	Standard deviation	Minimum	Maximum
REM	195	0.635	0.693	0.028	3.894
WUI	195	0.196	0.136	0.005	1.027
MIGRFL	195	220514.100	285151.800	3989.000	1495558.000
OPEN	195	77.017	38.589	18.143	246.143
GDPC	195	41929.730	14790.640	16323.980	87047.580
REER	195	98.790	10.922	77.039	142.073
FD	195	0.722	0.125	0.434	0.985

Appendix 3b: Pairwise correlation among variables

	REM	WUI	MIGRFL	OPEN	GDPC	REER	FD
REM	1.0000						
WUI	0.1692*	1.0000					
MIGRFL	-0.1839*	0.1999*	1.0000				
OPEN	0.3364*	0.1418*	-0.3325*	1.0000			
GDPC	0.5227*	0.2196*	0.0137	0.2824*	1.0000		
REER	0.3831*	-0.0494	0.0843	-0.2033*	0.1555*	1.0000	
FD	0.0845	0.1672*	0.4340*	-0.1324*	0.3996*	0.0799	1.0000

Note: * p -value < 0.1.