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RETRACTED: Foreign inflows, commercial law, and dutch disease: Evidence from developing economies

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RETRACTED

It is commonly believed that developing markets require inflows of foreign capital to achieve their growth targets; however, recent research has shown that these inflows are either ineffective or even harmful to the economy. A surge in foreign inflows, such as foreign aid, remittances, and foreign direct investment, into developing markets, particularly, have been connected to the Dutch disease hypothesis. A sharp rise in such inflows will stimulate real exchange rate in receiving nations due to the uptick in the non-tradable sector and the downturn in the tradable sector. The purpose of this research is to investigate, using quantitative approaches, the variations of real exchange rate adjustments that occur in response to official development assistance, foreign direct investments, and international remittances flowing into developing markets. To investigate the onset of Dutch Disease over the period 2001–2020, this analysis makes use of panel data estimation techniques in the form of fixed and random effect models The findings of a substantial amount of econometric investigation revealed that Dutch Disease is present in developing countries. The scope of the study has been broadened to include an investigation of the expansion of both tradable and non-tradable industries. According to the findings of this study, larger inflows of foreign capital slow growth in the tradable sector (the industrial sector), while simultaneously boosting growth in the non-tradable sector (Service sector).

KEYWORDS
foreign aid, FDI, sustainable environment, commercial law, Dutch Disease, panel data models

1 Introduction

To accomplish the macroeconomic goals, emerging economies have been actively pursuing capital inflows in the form of foreign assistance, foreign direct investment, and remittances from emigrants. Therefore, analyzing the macroeconomic effects of foreign inflows in recipient countries has a significant role in the literature on inflows' effectiveness. For researchers, the real exchange rate appreciation (RER) problem, also referred to as Dutch Disease, is crucial. Because the country depends on foreign financing to meet the resource gap, the Dutch disease occurrence is of the highest relevance from an

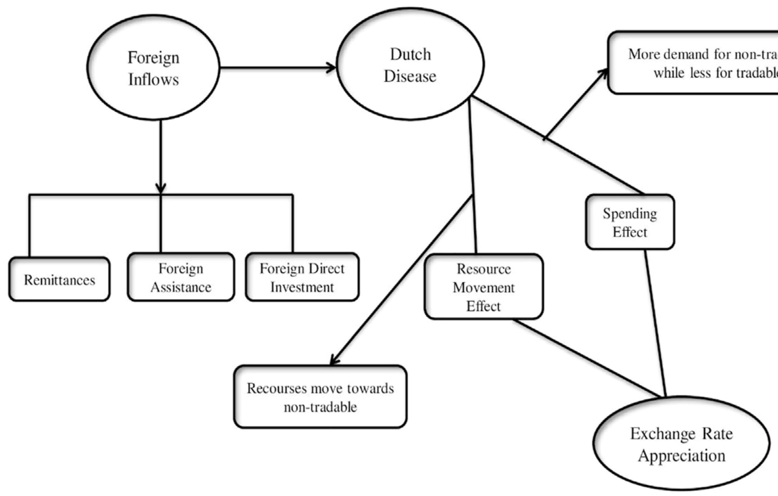

FIGURE 1
Theoretical framework for Dutch disease.

economic standpoint for emerging countries. Moreover, the catastrophe that hit the Netherlands in the 1960s due to the discovery of vast natural gas reserves in the Northern Sea served as the basis for the Dutch Disease.

The Balassa-Samuelson effect theory (Balassa, 1964) and the Salter-Swan-Corden Dornbusch model developed by Corden and Neary (1982) and Van Wijnbergen (1984) have provided the theoretical framework for the existence of Dutch Disease Effect. These theories argue that the economic effects of foreign aid, natural resource exports, and emigrant remittances, which comprise the bulk of capital inflows, increase aggregate demand and disposal income. It raises the relative prices of non-tradable goods (the spending effect), increasing the real exchange rate, further shifting resources away from the tradable sector (resource movement effect). So, in this way, The Dutch Disease can be discriminated in two phases (Godfrey et al., 2002); the first is the "resource movement effect," and the second is the "spending effect." Figure 1 represents the theoretical framework for the existence of Dutch Disease in developing economies.

Primary sources of foreign inflows are personal remittances, foreign assistance, and FDI. For undeveloped nations, emigrant remittances are a significant source of foreign funds. Remittances are sent to developing nations more substantially than foreign direct investment and official development assistance.

Remittances are one of the significant sources of income for people in low-income countries and developing nations to support better living standards for people in low-income nations. Foreign direct investment (FDI) is when a company takings supervisory possession of a business object in another country. With FDI, foreign businesses are directly intricate with day-to-day processes in the other country. They are not just taking money with them and information, assistance, and expertise.

According to the World Bank, low- and middle-income nations received a total of $529 billion in remittances in 2018, which was 9.6 percent more than the previous record high of $483 billion in 2017. Foreign employees and their dependents at home were significantly impacted by the catastrophic financial crisis that occurred in the year 2020. According to projections made by the World Bank for the year 2020, the proportion of pre-epidemic income represented by remittances to family members will decrease by 14%[1]. It forecasted a rise in the number of unemployed immigrants, a decrease in the number of people moving to new nations, and an increase in the number of immigrants returning to their home countries. In general, remittances have been more constant when compared to conventional methods corporate and portfolio inflows; more lately, remittances have also been more even than assistance inflows.

Foreign official assistance alludes to the allocation of funds from governments, organizations, or public institutions of developed nations to governments of developing nations in the third world. The official name for this type of assistance is recognized as official development assistance (ODA), but it is more commonly referred to as foreign aid. ODA refers to the transfer of assets from advanced nations to the emerging countries through donations, transfer payments, and lending on economically reasonable terms. The growth in Official Development Assistance (ODA) from members of the OECD

1 https://www.worldbank.org/en/news/press-release/2019/04/08/record-high-remittances-sent-globally-in-2018.

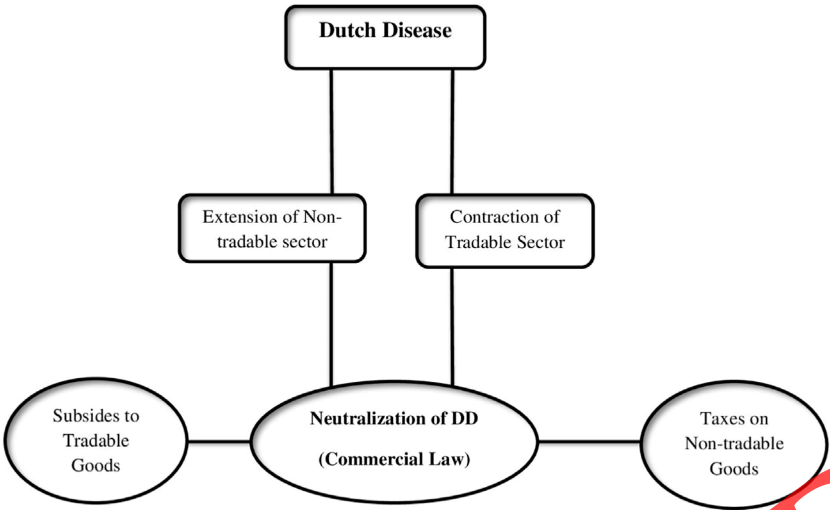

FIGURE 2
Neutralization of Dutch Disease through commercial law.

Development Assistance Committee (DAC) reached USD 161.2 billion in 2020, a 3.5 percent increase over 2019. This increase was driven by increased financing to assist developing states with COVID-19. There was a 4.1 percent rise in bilateral ODA directed toward Africa and a 1.8 percent increase toward LDCs. In addition, the amount of money given to fund humanitarian efforts rose by 6%. As a result, ODA increased by 4.4 percent in 2020, excluding aid spent on housing refugees within donor nations, which fell 9.5 percent from 2019 to USD 9.0 billion and mostly affected Canada, Iceland, and the Netherlands.

Foreign capital is essential for the growth of emerging economies, yet it may be unsuccessful due to the prevalence of Dutch Disease. Commercial law enables us to benefit from foreign capital in such situations. Commercial law, sometimes known as trade law, regulates the rights, interactions, and behaviors of individuals and organizations engaged in trade, retailing, marketing, and sales. The need for knowledge in this area has grown considerably due to globalization. A thorough interpretation and application of business law underpin economic integration. It enables resource-poor countries to bargain better terms in multilateral or bilateral trade agreements, whereas resource-rich nations can manage substantial foreign capital inflows.

Additionally, by bolstering the broader economy, the capacity for commercial law helps investment in places where it is constrained. The subsidization of tradable items and the introduction of taxes on purchasing such non-tradable commodities are two additional measures of combatting Dutch Disease through commercial law. Figure 2 illustrates how commercial law operates to prevent Dutch Disease.

The study's primary goal is to investigate the phenomena of Dutch Disease in developing countries. This study aims to determine whether foreign inflows in remittances, foreign direct investment, or official development assistance induce exchange rate hikes in developing economies by increasing the non-tradable sector.

2 Literature review

Analyzing the macroeconomic effects of aid in recipient countries has a significant role in the aid effectiveness literature. For researchers, the real exchange rate appreciation (RER) problem, also referred to as Dutch Disease, is crucial. The Dutch disease impact, which includes real exchange rate (RER) appreciation and a fall in the tradable sector, raises concerns about eroding long-term growth potential for the developing nations whose foreign inflows have expanded. This issue is related to the research on declining yield from foreign inflows recently gaining popularity. Dutch Disease is mentioned in this research as one of the channels via which foreign inflows can reduce results. The resource curse or the transfer dilemma is a term used to describe this aspect of foreign inflows. However, there have been few empirical investigations to prove the Dutch Disease theory in assessing the effectiveness of foreign inflows. This section contains some of the existing literature. Some studies have confirmed the occurrence of Dutch Disease, while others have refuted it. For example, (Adam and Bevan, 2006), studied aid, public expenditure, and Dutch Disease. The findings revealed that public infrastructure had generated productivity in favor of non-tradable countries, reduced real exchange rate, and enhanced export performance.

The term "commercial law" refers to a broad range of legal services that help firms make agreements with one another, carry them out, and resolve problems that arise along the way. Making sure that commercial law is adequately enforced in developing nations is one way to reduce the impact of Dutch Disease and utilize resources from abroad to promote corporate operations and economic growth.

Capital inflows and real exchange rates were the subjects of a study conducted together by researchers from Asia and Latin America (Athukorala and Rajapatirana, 2003). The findings indicated that the degree of gratitude in the real exchange rate related to capital inflow is constantly established in Latin American nations compared to their Asian contemporaries. This is the case even though Asian nations receive significantly more substantial foreign capital inflows concerning the size of their economies.

Fielding (2010) examined aid and Dutch Disease in ten of the Pacific Island States. The finding suggested that foreign aid recipient countries were affected mainly by Dutch Disease. However, middle-income countries were also affected by Dutch Disease due to inefficient government. Bourdet and Falck (2006) studied emigrant remittances and Dutch Disease in Cape Verde. The findings revealed that remittances increase a kind of Dutch Disease influence and thereby adversely affect the competitiveness of the tradable sector. However, the degree of this effect in Cape Verde is insignificant. Similarly, Rajan and Subramanian (2011) studied aid, Dutch Disease, and manufacturing growth. The result revealed that aid inflow had negatively affected the country's competitiveness by real exchange rate appreciation. Fielding and Gibson (2013) examined the aid and Dutch Disease by selecting 26 countries of Sub-Saharan Africa. The result revealed that in most countries, aid inflow had been caused by real exchange rate appreciation, and real exchange rates had depreciated in some countries. Makhlouf and Mughal (2013) studied Dutch Disease, Remittances, and competitiveness by using Bayesian analysis. The findings showed that Dutch Disease had negatively affected Pakistan's economy, and migrant remittance had inflows. Similarly, Ali et al. (2022) explored the existence of Dutch Disease in Pakistan due to a rise in foreign inflows in remittances, foreign direct investment, and official development assistance.

Uddin and Murshed (2017) studied international transfer and Dutch Disease by selecting South Asian countries. The result revealed that an increase in remittances had appreciated the real exchange rate. Remittances and foreign aid had a significant impact on reduced poverty alleviation. Oludimu and Alola (2021) investigated if crude oil production helps or hinders Nigeria's economy. They employed autoregressive distributed lag to analyze time-series data from 1980 to 2018. The studies confirmed the presence of Dutch Disease in Nigeria. Furthermore, oil rent was a limiting component of economic expansion in Nigeria, whereas the population benefited from growth.

The statistical findings of the "Dutch Disease" impact of foreign investment seem somewhat contradictory. The occurrence of Dutch Disease is not generally apparent in the literature. In this study, panel data is utilized to examine the evidence regarding the occurrence of Dutch Disease as a consequence of foreign inflows. The nations exhibit significant economic variability, mirrored in the degree to which they differ in how they react to foreign investment.

3 Data and methodology

Foreign resources are necessary for emerging economies to realize their developmental goals; hence it is imperative to determine whether or not these resources are advantageous. Unfortunately, one of the most significant factors that have been observed to decrease the efficiency of these resources is Dutch Disease. Therefore, the central purpose of this study is to see how many foreign resources, such as official aid, remittances, and foreign direct investment, contribute to the prevalence of Dutch Disease in developing nations.

3.1 Data sources

For empirical analysis, the sample consists of a panel dataset for 84 developing countries from 2001 to 2020. The primary data source is the world development indicator (World Bank).

3.2 Panel causality test

This study uses the panel causality test that is Dumitrescu and Hurlin (2012). To provide a more accurate assessment of the relationship between dependent and independent variables, the study will use panel causality tests. Granger's non-causality test version for heterogeneous panelized data structures with fixed coefficients has a straightforward structure that resembles this procedure (Granger, 1969). The format of this examination is as described below:

$$Y_{i,t} = \delta_i + \sum_{k=1}^{k} \rho_i^{(k)} y_{i,t-k} + \sum_{k=1}^{k} \eta_i^{(k)} x_{i,t-k} + \mu_{i,t} \; i = 1, 2, \ldots .N: t = 1, 2, \ldots . T \tag{1}$$

In this scenario, x and y are two stationary variables determined for N cross-sections across T periods. $\sum_{k=1}^{k} \eta_i^{(k)}$ effects δ_i and N cross-sections are supposed to be constant in the time dimension condition. Furthermore, the lag orders of K are regarded to be homogeneous throughout the entire cross-section of the panelized data under the survey. Moreover, the regression coefficients $\rho_i^{(k)}$ and $\eta_i^{(k)}$ are autoregressive parameters that are acceptable to fluctuate among groups. For this process;

H_0 = there is no causality relation for x and y in the panel data.

H_1 = there is a causality relation for x and y in the panel data.

If the estimated p-value is less than 5%, Ho is rejected, and the study concludes that x and y have a causal relationship.

3.3 Cross-section dependence test

Before determining the stationarity of the series, panel data models should be evaluated to verify if cross-sectional dependence occurs. As a result, the following hypotheses for evaluating cross-sectional dependence:

H_o: The concept of cross-sectional dependence.

H_1: There is not any cross-sectional dependency.

If the Ho hypothesis is found to be false, a first-generation unit root test will be carried out; however, if the Ho hypothesis is found to be valid, a second-generation unit root test will be carried out. Pesaran devised the following examination, which you must take Pesaran (2004):

$$CD = \sqrt{2T/N(N-1)}\ \sum_{i=1}^{N-1} x \sum_{i=1}^{N} x_{ij} \tag{2}$$

Where, $_{ij}$ is the sample value of the pair-wise residuals' correlation. Pesaran (2004) employed the CD test to evaluate cross-sectional dependence when T is less than N. In this testing method, the total value of correlation coefficients, incorporating cross-sectional residuals, is employed.

3.4 Panel unit root test

It is known that a stationary series has a steady mean, steady variance, and steady auto-covariance for each lag, which is why the concept of non-stationarity is essential. If the series is non-stationary, the difference should be taken until the series becomes stationary. However, the long-term data may be lost by taking differences to make the series stationary. It is, therefore, preferable to use a variable in its initial integration order. In this research, the Fisher ADF test, Harris-Tzavalis test, the Im-Pesaran-Shin (IPS) test, and Levin, Lin, and Shin (LLC) panel unit root test are used to test non-stationarity.

3.4.1 Levin-Lin-Chu test

In this research, Levin, Lin, and Shin's (LLC) panel unit root test is used to test non-stationarity (Levin et al., 2002). In 1992, Levin and Lin created one of the first panel unit root tests. Chu also collaborated with them in 2002 and established the Levin, Lin, and Chu test based on the unit root test of Dickey-Fuller. These questions are designed to alleviate the issues of heteroscedasticity and autocorrelation that were brought up in the original research. The above is the shape that their model requires:

$$\Delta Y_{i,t} = \alpha_i + \rho Y_{i,t-1} + \sum\nolimits_{k=1} \Phi_k Y_{i,t-k} + \delta_{i,t} + \theta_t + \mu_{i,t} \tag{3}$$

This model enables for two way fixed effects, one from the α_i and the second from θ_t so we have fixed unit-specific impacts as well as unit-specific time trends. This test's null hypothesis is that "the series has unit root or non-stationary issue."

3.4.2 Harris and Tzavalis test

Harris and Tzavalis' (HT) test extend to Jongwanich and Kohpaiboon, 2013 analysis by examining inference for fixed T and asymptotic solely in the cross-section dimension N. They studied at serially uncorrelated errors to get their results.

3.4.3 The Im, Pesaran and Shin test

The well-known Im, Pesaran, and Shin test (IPS) is the next test based on the cross-sectional independence assumption established in this paper (Im et al., 2003). Under the alternative hypothesis, this test, unlike LLC, allows for heterogeneity in the value of ρ_i. IPS uses the LLC model and replaces ρ with ρ_i. Their current model, which includes individual impacts but no time trend, is as follows:

$$\Delta Y_{i,t} = \alpha_i + \rho_i Y_{i,t-1} + \sum\nolimits_{k=1} \Phi_k Y_{i,t-k} + \delta_{i,t} + \theta_t + \mu_{i,t} \tag{4}$$

The null hypothesis is defined as H0 : $\rho_i = 0$ for all i = 1,. . .,N and the alternative hypothesis is H1 : $\rho_i < 0$ for i = 1,. . ., N_1 and $\rho_i = 0$ for i = N_1 + 1,. . ..,N; with $0 < N_1 \le N$. The alternative hypothesis allows for some of the individual series to have unit-roots. IPS uses independent unit root tests for the N cross-section units rather than pooling the data. Their test depends on Dickey-Fuller statistics that have been averaged across groups.

3.4.4 ADF Fisher test

The IPS utilises an average statistic, while another testing approach is based on combining the observed significant levels from the separate tests. This strategy is referred to as "combining the observed significant levels." In the context of panel unit root testing, Maddala and Wu are most notable for utilising this method, which is based on tests of the Fisher type (Edwards, 2005) was notably used by Maddala and Wu (1999). We test the same hypothesis as IPS, The null hypothesis is defined as H0 : $\rho_i = 0$ for all i = 1,. . .,N and the alternative hypothesis is H1 : $\rho_i < 0$ for i = 1,. . ., N_1 and ρ_i = 0 for i = N_1 + 1,. . ..,N; with $0 < N_1 \le N$. The Fisher type test is based on a simple concept. Look at unit root test statistics for pure time series such as ADF. The corresponding p-values, represented by I, are uniform (0; 1) variables if these statistics are continuous. As a result, under the critical premise of cross-sectional independence, Maddala and Wu (1999) suggested the statistic:

$$p_{MW} = -2\sum_{i=1}^{N}\log(p_i) \tag{5}$$

When T approaches infinity and N is static, it has a chi-square distribution with 2N degrees of freedom.

3.5 Panel data estimation techniques

Panel data is multidimensional data that includes measurements taken across time. For the same cross-section, panel data are observations of various events collected across multiple periods. Firstly, static panel data analysis is used in this study to explore the existence of Dutch Disease as a consequence of increasing foreign inflows into emerging economies. Time-series and cross-sectional data are both considered in static panel data analysis. Fixed and random effects are two types of static panel data model estimation approaches.

3.5.1 The fixed-effects model

In the regression equation of the fixed effects (FE) model, α_i is a group-specific constant term.

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + \varepsilon_{it} \tag{6}$$

Where $''i''$ stands for cross-section i = 1,2,3,. . ., N) and $''t''$ stands for time-series (t = 1, 2,3,. . ., T). The individual influence i is thought to be constant across time (t) and unique to each cross-sectional unit (i). The term i is thought to refer to the non-observable and non-quantifiable features that distinguish individual units. In essence, this means that all differences between individuals are constant throughout time and are depicted as regression function parametric shifts.

3.5.2 The random effects model

The error component model, commonly known as the random effects (RE) model, comprises a non-measurable stochastic variable that distinguishes individuals. It is written as follows:

$$Y_{it} = \alpha_i + \beta_1 X_{1it} + \beta_2 X_{2it} + \ldots + \beta_k X_{kit} + \mu_i + \varepsilon_{it} \tag{7}$$

Where, the term μ_i is a stochastic variable that represents unobservable or non-measurable disturbances that explain individual differences. Rather than being a fixed parameter, the effect is assumed to be a random individual effect.

3.7 Model

Three models are built for empirical study to assess the occurrence of Dutch Disease as a result of foreign inflows into emerging economies. The first model examines the impact of foreign resources on the real exchange rate. The basic equation of the model 1 is:

$$\begin{aligned} RER_{i,t} = {} & \beta_0 RER_{i,t-1} + \beta_1 ODA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 REMI_{i,t} \\ & + \beta_4 TRADE_{i,t} + \beta_5 M2_{i,t} + \beta_6 CONEXP_{i,t} + \mu_t + \nu_{i,t} \end{aligned} \tag{8}$$

Where the letters i and t in the subscript represent the country and the time, respectively. RER stands for "Real Exchange Rate," and it is the primary component that is considered when calculating the amount of money coming into the home country from other countries. For instance, official development assistance (ODA) is defined as a percentage of gross national income (GNI), whereas foreign direct investment (FDI) refers to the inflows of FDI. The model also makes use of a number of control variables, all of which are included because of the possible impact they have on the real exchange rate. Some economic indicators, such as trade openness (TRADE), broad money (M2), and government consumption expenditures, are included among the control variables (CONEXP). t denotes time-fixed effects that measure the influence of business cycles, and $\nu_{i,t}$ stands for an error term.

The second and third models are designed to assess the influence of foreign resources on the tradable and non-tradable sectors, respectively. The industrial sector is a tradable sector, whereas the service sector is a non-tradable sector. The main equations of model 2 and 3 are:

$$\begin{aligned} SERVICE_{i,t} = {} & \beta_0 SERVICE_{i,t-1} + \beta_1 ODA_{i,t} + \beta_2 FDI_{i,t} \\ & + \beta_3 REMI_{i,t} + \beta_4 TRADE_{i,t} + \beta_5 M2_{i,t} \\ & + \beta_6 CONEXP_{i,t} + \mu_t + \nu_{i,t} \end{aligned} \tag{9}$$

where SERVICE represents growth of service sector also called non-tradable sector.

$$\begin{aligned} INDUS_{i,t} = {} & \beta_0 INDUS_{i,t-1} + \beta_1 ODA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 REMI_{i,t} \\ & + \beta_4 TRADE_{i,t} + \beta_5 M2_{i,t} + \beta_6 CONEXP_{i,t} + \mu_t + \nu_{i,t} \end{aligned} \tag{10}$$

where INDUS represents growth of industrial sector also called tradable sector.

3.7 Variable description

Table 1 describes the dependent and independent variables used in this study.

4 Findings and discussion

This section presents empirical findings to fully understand the phenomena of Dutch Disease and a pathway by which it mitigates the positive effects of foreign inflows on economic growth in developing economies.

First, empirical analysis is carried out to estimate three models. An empirical finding for model 1 is to evaluate the influence of foreign inflows on real exchange rates in developing

TABLE 1 Description of variables used in the analysis.

Variables/Measurement	Description
Real Exchange Rate (RER)	Price level proportion is the ratio of purchasing power parity (PPP). It is converted to an exchange rate
Foreign Aid (ODA) as a percentage of GNI	It incorporates funds on concessional terms from bilateral, multilateral organizations, and non-DAC nations
Personal remittances received (REMI) Percentage of GDP	Personal transfers and employee remuneration are included in personal remittances. All cash transfers made or received by resident households to or from nonresident households are referred to as private transfers
Foreign Direct Investment, net inflows (FDI) Percentage of GDP	According to the balance of payments, foreign direct investment is made up of equity capital, reinvestment of earnings, other long-term capital, and short-term capital
Broad money (M2) Percentage of GDP	Money is in the form of currency, coins, demand deposits, and time deposits, including banks and other deposits. It means how much money is circulating in the economy
General government final consumption expenditure (CONEXP) Percentage of GDP	All current government spending is included in general government final consumption
Trade Openness (TRADE) Percentage of GDP	Trade is the total of goods and service exports and imports expressed as a percentage of gross domestic products
Industry (including construction), value added (INDUS) Percentage of GDP	It includes value added in mining, manufacturing, construction, electricity, water, and gas
Services, value-added (SERVICE) Percentage of GDP	It includes value-added in comprehensive and selling trade, transport, and management, economic, expert, and private services such as education, health care, and real estate

TABLE 2 Statistical summary of variables.

Variables	Observations	Unit of measurement	Mean	Median	Max	Min	St. Dev
RER	1,680	PPP/ER*	0.584	0.392	48.04	0.117	2.528
REMI	1,680	% of GDP	5.744	2.852	50.101	0.0009	7.254
ODA	1,680	% of GNI	4.351	2.229	62.2	−0.643	5.732
TRADE	1,680	% of GDP	74.55	67.91	211.50	0.175	34.99
M2	1,680	% of GDP	50.22	40.08	259.17	2.857	38.15
FDI	1,680	% of GDP	4.031	2.81	55.07	−8.401	4.92
CONEXP	1,680	% of GDP	14.24	13.84	43.48	0.952	5.32
SERVICE	1,680	% of GDP	49.23	49.87	87.16	10.88	9.78
INDUS	1,680	% of GDP	27.06	25.33	77.42	4.556	10.49

Note: *Price level ratio of PPP, conversion factor (GDP) to market exchange rate.

TABLE 3 Correlation matrix.

Variables	RER	REMI	ODA	TRADE	M2	FDI	CONEXP	SERVICE	INDUS
RER	1								
REMI	−0.063	1							
ODA	−0.062	−0.009	1						
TRADE	−0.137	0.25	−0.089	1					
M2	−0.042	0.149	−0.286	0.24	1				
FDI	−0.055	0.082	0.041	0.341	0.03	1			
CONEXP	−0.028	0.176	0.054	0.282	0.093	0.108	1		
SERVICE	−0.076	0.246	−0.267	0.118	0.414	0.029	0.232	1	
INDUS	−0.046	−0.204	−0.31	0.214	0.017	−0.005	−0.033	−0.396	1

TABLE 4 Test results for multi-collinearity.

Variable	VIF	1/VIF
REMI	1.77	0.564,972
ODA	1.59	0.628,931
TRADE	6.25	0.16
M2	2.9	0.344,828
FDI	1.91	0.52356
CONEXP	5.91	0.169,205

TABLE 5 Showing CD test results.

Variable	CD test	*p*-value
REMI	154.68	0.000***
ODA	15.99	0.000***
TRADE	53.11	0.000***
M2	131.67	0.000***
FDI	19.92	0.000***
CONEXP	25.68	0.000***
RER	31.31	0.000***
INDUS	13.35	0.000***
SERVICE	39.04	0.000***

Note: *** indicates that all coefficients are significant at the 1% significance level.

economies. Then, a further empirical study is carried out for models 2 and 3 to see how foreign inflows affect the growth of tradable and non-tradable sectors. Finally, the most important statistics from the data are shown in Table 2. Mean, median, maximum, and minimum values of all variables and their standard deviations are listed in it.

Table 3 shows the correlation matrix for all variables used in this study. High correlations are defined as values that are considerably close to −1 and/or +1, indicating multicollinearity, which necessitates the calculation of the variance inflation factor (VIF). The findings of VIF's multicollinearity test are shown in Table 4. High multicollinearity is appropriate if VIF is greater than 10, and it can significantly impact the outcomes of ordinary least square regression estimations. However, all variables have a VIF of less than 10, as shown in Table 4, and multicollinearity has no effect on this research.

The latest research suggests that panel data sets may be reliant on cross-sections. As a result, a cross-section dependence (CD) test is done in this research, and the outcomes are listed in Table 5. Table 5 illustrates that the null hypothesis is rejected, and the alternative hypothesis is accepted in this case. Rejection of the null hypothesis means that any alterations and specific disruptions for any variable of an economy do not lead to alterations in that variable in the other economies within the panel data set.

The results of the Granger Causality test are summarized in Table 6. This is worth noting that the outputs display W (W-bar) and Z (Z-bar). The null hypothesis that REMI does not Granger-cause RER and the null hypothesis that RER does not Granger-cause REMI both are rejected by the W-stat and Z-bar statistic. It suggests that remittances cause the current level of the real currency rate in emerging economies. Furthermore, remittances are influenced by the prevailing real exchange rate in underdeveloped economies. The null hypothesis that FDI does not Granger-cause RER is rejected, while the null hypothesis that RER does not Granger-cause FDI is supported by the W-stat and Z-bar statistic. Theoretically, both remittances and ODA can influence the real exchange rate through resource movement and spending effects, known as the Dutch Disease. According to the Granger Causality test, RER has no direct influence on FDI, but FDI can influence RER. M2, consumption expenditures, and trade openness have an identical causal association with the real exchange rate.

The requirement to determine the stationarity level of every variable under investigation is commonly accepted, as they are often regarded as non-stationary. This paper used the Fisher ADF test, the Harris-Tzavalis test, Lin-Levin-Chu (LLC) test, and the Im-Pesaran-Shin (IPS) test, among the various panel unit root tests identified in the literature. The non-stationary null hypothesis is tested for each variable in the study, and the conclusions are shown in Tables 7, 8 below. The study can estimate the regression coefficients because all variables are determined to be stationary at their first difference levels. According to the Fisher ADF test, RER, CONEXP, TRADE, and INDUS are stationary at their second difference level. These variables are stationary at their first level for other unit root tests.

There are two main steps to empirical analysis. The first step is to investigate the direct relationship between foreign inflows and the real exchange rate to assess Dutch Disease in emerging countries. The second is to empirically determine the growth of tradable and non-tradable sectors when foreign inflows are received. Because aggregate foreign inflows are inconsequential in evaluating Dutch Disease effects, these are split into three major types (REMI, ODA, and FDI).

The coefficients of all three models are estimated using panel data analysis. Fixed Effect Model and Random Effect Model are used for this purpose. Estimated coefficients of Model 1 are listed in Table 9. Remittances and foreign direct investment, according to estimated results, cause exchange rate appreciation; however, these findings are negligible. Official development assistance, on the other hand, which is a significant source of foreign funds, has a considerable impact on the real exchange rate. As a result, official development assistance appreciates the exchange rate significantly. M2, consumption expenditures, and trade

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TABLE 6 Findings of pair-wise Granger Causality tests between variables and Real Exchange Rate.

Null hypothesis	W-stat	Zbar-stat	Prob
REMI does not homogeneously cause RER	3.35168	3.18775	0.0014***
RER does not homogeneously cause REMI	5.32338	9.54911	0.000***
ODA does not homogeneously cause RER	3.17292	2.61100	0.009***
RER does not homogeneously cause ODA	5.27596	9.39612	0.000***
TRADE does not homogeneously cause RER	3.82869	4.72674	2.00E-06***
RER does not homogeneously cause TRADE	4.28948	6.21339	5.00E-10***
M2 does not homogeneously cause RER	4.32565	6.33009	2.00E-10***
RER does not homogeneously cause M2	3.78730	4.59322	4.00E-06***
FDI does not homogeneously cause RER	3.02404	2.13069	0.0331**
RER does not homogeneously cause FDI	2.89228	1.70556	0.0881
CONEXP does not homogeneously cause RER	3.26788	2.91739	0.0035***
RER does not homogeneously cause CONEXP	4.45490	6.74711	2.00E-11***
SERVICE does not homogeneously cause RER	3.49925	3.66386	0.0002***
RER does not homogeneously cause SERVICE	4.99117	8.47730	0.000***
INDUS does not homogeneously cause RER	4.15860	5.79113	7.00E-09***
RER does not homogeneously cause INDUS	5.19432	9.13271	0.000***

Notes: *** and ** indicate that the coefficients are significant at the 1 and 5% levels of significance, respectively.

TABLE 7 Panel Unit root test results (Fisher ADF Statistics and Im-Pesaran-Shin Statistics).

Variables	Fisher ADF statistic				Im-pesaran-shin statistic		
	At level	1st difference	2nd difference	Decision	At level	1st difference	Decision
RER	−0.339 (0.633)	−6.779 (1.000)	17.482 (0.000)***	I (2)	−1.744 (0.041)*	2.895 (0.000)***	I (1)
ODA	12.113 (0.000)***			I (0)	−7.311 (0.000)***		I (0)
FDI	22.84 (0.000)***			I (0)	−9.196 (0.000)***		I (0)
REMI	6.87 (0.000)***			I (0)	−1.259 (0.104)	−4.924 (0.000)***	I (1)
M2	−3.484 (0.998)	−1.491 (0.932)	8.055 (0.000)***	I (2)	8.904 (1.000)	−4.168 (0.000)***	I (1)
CONEXP	1.599 (0.055)*	1.944 (0.0259)**	16.081 (0.000)***	I (2)	1.5148 (0.935)	−5.849 (0.000)***	I (1)
TRADE	0.726 (0.234)	0.739 (0.2297)	16.978 (0.000)***	I (2)	−0.339 (0.367)	−5.329 (0.000)***	I (1)
INDUS	−2.303 (0.99)	−0.055 (0.522)	12.214 (0.000)***	I (2)	3.059 (0.999)	−4.856 (0.000)***	I (1)
SERVICE	2.01 (0.022)**			I (0)	0.536 (0.704)	−5.946 (0.000)***	I (1)

Notes: ***; ** and * indicate that the coefficients are significant at the 1, 5, and 10% significance levels, respectively.

openness coefficients reveal that these variables also appreciate the exchange rate considerably. These results are also confirmed by Hasanov (2013) and Jongwanich and Kohpaiboon (2013). Determining whether country effects correlate with the independent and control (explanatory) variables in the regression is a crucial part of deciding between Fixed Effects and Random Effects model estimations. The Random Effects paradigm is more dependable and thus more useful in settings without correlation.

On the other hand, if there is an indication of association, there is a risk of omitted factor bias, which requires the use of estimates based on fixed effects. The Random Effects model should be considered the preferred framework when applying the Hausman Test because the null hypothesis mandates this. On the other hand, the alternative hypothesis suggests that the Fixed Effects model is an appropriate choice. The Fixed Effect Model is recommended because the Hausman test in Table 9 reveals that the estimate of 17.72 has a p-value of 0.007, which is less than 5 percent. This indicates that the Fixed Effect Model should be used.

Table 10 displays the empirical estimates for model 2 to investigate the influence of foreign inflows on the non-

TABLE 8 Panel Unit test results (Lin-Levin-Chu statistics and Harris-Tzavalis Statistic).

Variables	Lin-levin-Chu statistics			Harris-Tzavalis statistic		
	At level	1st difference	Decision	At level	1st difference	Decision
RER	−7.978 (0.000)***		I (0)	0.802 (0.000)***		I (0)
ODA	−13.451 (0.000)***		I (0)	0.479 (0.000)***		I (0)
FDI	−10.663 (0.000)***		I (0)	0.811 (0.000)***		I (0)
REMI	−4.603 (0.000)***		I (0)	0.831 (0.000)***		I (0)
M2	1.582 (0.9432)	−3.821 (0.000)***	I (1)	0.907 (0.999)	0.475 (0.000)***	I (1)
CONEXP	−1.271 (0.102)	−4.987 (0.000)***	I (1)	0.776 (0.000)***		I (0)
TRADE	−2.13 (0.017)**	−5.811 (0.000)***	I (1)	0.826 (0.025)**		I (0)
INDUS	−1.576 (0.058)*	−6.369 (0.000)***	I (1)	0.845 (0.232)	0.649 (0.331)	—
SERVICE	−2.811 (0.003)***	−5.531 (0.000)***	I (1)	0.807 (0.009)***		I (0)

Note: ***; ** and * indicate that the coefficients are significant at the 1, 5, and 10% significance levels, respectively.

TABLE 9 Findings of panel data for Dutch Disease.

Dependent variable: Real exchange rate(RER)

Variables	Random effect model		Fixed effect model	
	Coefficient (Z-stat)	*p*-value	Coefficient (t-stat)	*p*-value
REMI	−0.008 (−0.56)	0.576	−0.009 (−0.55)	0.583
ODA	−0.043 (−2.97)	0.003	−0.046 (−3.01)	0.003
TRADE	−0.013 (−4.00)	0.000	−0.016 (−4.37)	0.000
FDI	−0.008 (−0.62)	0.534	−0.006 (−0.44)	0.662
M2	−0.008 (−2.47)	0.013	−0.012 (−2.84)	0.005
CONEXP	−0.077 (−4.09)	0.000	−0.107 (−5.05)	0.000
R^2	0.016		0.014	
Wald (χ^2)	61.85	0.000		
F-statistic			16.97	0.000
No. of obs	1,680		1,680	
Hausman Test (χ^2)	Coefficient		*p*-value	
	17.72		0.007	

tradable sector of an economy, which is represented by the service sector. The estimated coefficients for foreign direct investment and remittances imply that these inflows resulted in a significant increase in the size of the non-tradable sector. Still, the ODA coefficient had a negligible influence. The Fixed Effect Model and the Random Effect Model show the same outcomes. According to empirical findings, increases in consumption expenditures and money supply improve the non-tradable sector's growth rate, whereas trade openness reduces growth in this sector. Through the resource moment effect as well as the expenditure effect, these findings are reflective of Dutch disease occurrences. The idea that remittances have contributed to the loss of competitiveness in important exports by diverting resources to the development of non-tradable items and services in developing economies would be supported by a clear negative association (Lartey, 2008; Meyer and Shera, 2017).

The Hausman test in Table 10 shows that the estimate of 28.61 has a *p*-value of 0.0001, which is less than 5%, indicating that the Fixed Effect Model is recommended.

The empirical estimates for model 3 to evaluate the influence of foreign inflows on the tradable sector represented by an economy's industrial sector are shown in Table 11. The estimated coefficients for FDI and ODA reveal that these inflows resulted in a significant reduction in the size

TABLE 10 Findings of panel data for the Non-tradable sector.

Dependent variable: Non-tradable sector (SERVICE)

Variables	Random effect model		Fixed effect model	
	Coefficient (Z-stat)	*p*-value	Coefficient (t-stat)	*p*-value
REMI	0.139 (4.33)	0.000	0.132 (3.98)	0.000
ODA	−0.01 (−0.33)	0.740	0.0025 (0.08)	0.933
TRADE	−0.095 (−14.05)	0.000	−0.101 (−14.50)	0.000
FDI	0.069 (2.65)	0.008	0.073 (2.81)	0.005
M2	0.099 (12.73)	0.000	0.099 (12.07)	0.000
CONEXP	0.433 (10.84)	0.000	0.432 (10.54)	0.000
R^2	0.171		0.16	
Wald (χ^2)	548.32	0.000		
F-statistic			89.83	0.000
No. of obs	1,680	1,680		
Hausman Test (χ^2)	Coefficient		*p*-value	
	28.61		0.0001	

TABLE 11 Findings of static panel data for the Tradable sector.

Dependent variable: Tradable sector (INDUS)

Variables	Random effect model		Fixed effect model	
	Coefficient (Z-stat)	*p*-value	Coefficient (t-stat)	*p*-value
REMI	−0.01 (−0.35)	0.728	0.01 (0.33)	0.738
ODA	−0.104 (−3.76)	0.000	−0.09 (−3.28)	0.001
TRADE	0.089 (13.84)	0.000	0.089 (13.56)	0.000
FDI	−0.075 (−3.07)	0.000	−0.073 (−2.98)	0.003
M2	−0.049 (−6.59)	0.000	−0.053 (−6.79)	0.000
CONEXP	−0.203 (−5.34)	0.000	−0.201 (−5.22)	0.000
R^2	0.078		0.07	
Wald (χ^2)	264.12	0.000		
F-statistic			133.34	0.000
No. of obs	1,680	1,680		
Hausman Test (χ^2)	Coefficient		*p*-value	
	33.79		0.000	

of the tradable sector. In contrast, the remittance coefficient shows a negative but negligible impact on the trading sector. The Fixed Effect Model and the Random Effect Model yield the same conclusions. According to empirical evidence, rising consumption expenditures and money supply cause the tradable sector's growth rate to slow, whereas increased trade openness causes this sector's growth to accelerate. These findings also suggest that Dutch Disease exists due to the resource moment effect and the spending effect. Empirical findings indicate the presence of Dutch Disease in developing countries are theoretically consistent (Cambazoglu and Günes, 2016). The Hausman test in Table 11 shows that the estimate of 33.79 has a *p*-value of 0.000, which is less than 5%, indicating that the Fixed Effect Model is preferred.

4.1 Discussion

The achievement of sustainable development goals established by the United Nations to strengthen emerging economies depends heavily on foreign investment. Foreign inflows to developing economies typically take the form of migrant remittances, foreign direct investment, and foreign aid, also known as official development assistance. These capital inflows are distinct from one another in terms of their nature, conditions, and objectives. Therefore, it makes sense that these inflows would increase productivity and development in emerging economies. However, we have looked at the worrying reality that these inflows can negatively impact the economy in this study.

This study supports the idea that increased capital inflows increase consumer expenditure on non-tradable goods. The service sector is another name for an economy's non-tradable sector. This sector plays a negligible part in world trade. Conversely, the tradable sector, also known as the industrial sector, which contributes significantly to global trade, is in decline. Exchange rates appreciate when there is a high volume of non-tradable and a low volume of tradable. Dutch Disease is the term used to describe this condition.

This research suggests that FDI and remittances have negligible effects while official development assistance dramatically increases exchange rates. However, the non-tradable sector expands more quickly with increased remittance and FDI inflows, while FDI and ODA dramatically shrink the tradable sector. Redirecting these foreign exchanges for investment into the tradable sector would eliminate the spending and resource movement effects associated with foreign inflows in developing economies. This study thus supports the Dutch Disease Hypothesis in emerging economies.

5 Conclusion and policy implications

The impact of foreign inflows, which include foreign aid, remittances, and foreign direct investment, on the real exchange rate is explored in this research. For this purpose, data is collected for 84 emerging economies from 2001 to 2020. To test the robustness of findings, empirical estimation is carried out using a variety of panel data estimation approaches. These estimation techniques include fixed effect and random effect to assess the data, some diagnostic tests are used. Finally, it is concluded that foreign inflows to emerging countries increase non-trading sector spending, but tradable sector spending declines, and resources shift from tradable to non-tradable sectors. As a result, the real exchange rate of emerging economies appreciates. The spending and resource movement effects in this study confirm the presence of Dutch Disease.

It is critical for policymakers to be concerned about the negative repercussions of foreign resources. The prevalence of Dutch Disease is an unanticipated outcome of the inflow's richness, but these adverse outcomes would not necessarily outweigh the inflow's advantages. The problem for policymakers is appropriately balancing the pros and cons of growing foreign inflows. As a result, the best policy option is to take full advantage of the benefit while also dealing with adverse repercussions. Dutch Disease is a significant concern to emerging markets. The economy needs to be cleansed of it. Strict commercial laws should be realistic and effectively implemented. Through measures in commercial law, Dutch Disease might be lessened. These initiatives include supporting the industrial sector with subsidies, upgrading public administration and financial planning, empowering communities, and removing internal weaknesses in the trading system.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Conflict of interest

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