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Evidence of Economic Imbalance: The Presence of Dutch Disease in the Developing Nations

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ABSTRACT

Objective: The present study employs the Dutch Disease paradigm to evaluate the macroeconomic and structural impacts of foreign aid in the developing nations. It considers the issue of inflows of foreign assistance whether it leads to real exchange rate appreciation and reallocates resources between non-tradable services sectors at the expense of industrial value addition.

Research Gap: The literature extensively examines the growth effects of foreign aid in developing economies, yielding mixed evidence. However, the presence of Dutch Disease remains insufficiently explored, particularly with respect to sector-specific value-added responses between non-tradable services and tradable industrial goods. This study investigates Dutch Disease by assessing the impact of foreign aid on the exchange rate and complements the analysis with a sectoral evaluation for deeper insight.

Design/Methodology/Approach: In this analysis, data of 74 developing countries during the period of 2000-2022 are used. The paper is based on System GMM that manages endogeneity and dynamic interactions.

The Main Findings: Foreign aid significantly appreciates the real exchange rate in developing countries. This appreciation shifts resources toward non-tradable services and reduces industrial value added. The results provide strong evidence of Dutch Disease, indicating both macroeconomic impacts and structural distortions.

Theoretical / Practical Implications of the Findings: It emphasizes the impact of foreign aid as a non-neutral macroeconomic agent on the productive structure in developing countries in the long run, putting greater weight on the theoretical association between capital inflows, real exchange rate behavior, and structural change.

Originality/Value: Value of the paper lies in its empirical evidence on identifying Dutch Disease as a channel explaining the ineffectiveness of foreign aid in developing economies and consequently explains contribution of foreign aid to sectoral distortions in developing economies.

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1. Introduction

Foreign aid has significantly contributed to the development policies of the low and middle-income countries

over the past decades. Macroeconomic impacts of foreign aid which targets to alleviate capital constraints, stimulate growth, and facilitate structural adjustment have been hotly debated over a long period of time. Of major concern is that sustained and large aid flows may create similar distortions with the same effect which accompanies a natural resource boom, what is commonly referred to as Dutch Disease (Corden & Neary, 1982; Rajan & Subramanian, 2011). Instead of long-term development, such distortions might increase the imbalances in the economies of developing countries that have limited institutional capabilities and that have productive diversity.

The Dutch Disease hypothesis argues that the competitiveness of the tradable sector may be affected adversely in the occurrence of influx of foreign currency, whether in the form of remittances, export of natural resources or foreign aid since this may result into appreciation of the exchange rate. This mechanism operates in two ways; first the spending effect, which occurs when the incomes of people increase and positively demand non-tradables, and second, the resource movement effect, and occurs when the factors of production are shifted to non-tradables (Corden, 1984). This may result in the deterioration of export-led growth and restructuring of the manufacturing and tradable industries in general and a growth in the service sector.

The question regarding the existence or absence of the practical applicability of the Dutch Disease concept to the context of international assistance remains debatable. According to research conducted by Arellano et al. (2009) and Rajan and Subramanian (2011), foreign aid has the effect of increasing the real exchange rate and a decline in the performance of manufacturing. Nevertheless, other researchers argue that the impact is contingent on the nature of assistance, capacity of the nation to internalize it, and responses of the macroeconomic policy makers (C. S. Adam & Bevan, 2006; Berg et al., 2013). In addition, it is beginning to be evident that investments in infrastructure, human capital, and other productivity-enhancing sectors, which are aid-financed, may offset or even reverse the adverse impacts on competitiveness in the long term (Selaya & Sunesen, 2012).

Previous studies such as those by Rajan and Subramanian (2011), Adam and Bevan (2006), and Berg et al. (2013) mainly focus on the macroeconomic consequences of foreign aid and its implications for growth, exchange rate dynamics, and macroeconomic management. Irrespective of the extensive research work, two significant gaps exist. To begin with, there exists the conflicting facts about whether foreign aid influences the exchange rates of the developing nations, and it is determined by the situation in a country. Second, the sectoral effect of Dutch Disease is not well studied when comparing how the aid affects the growth of the service industry and the value of the industry. The Dutch Disease can be more easily assessed by using sectoral value-added analysis, which approximates the damage to the non-tradables on the tradable industry. The study will add to the knowledge by investigating whether foreign aid to poor nations is as harmful as Dutch Disease is. The research has two goals. The effect of foreign assistance on the real exchange rate is realized to find out whether it is possible to spread Dutch disease. Second, it discusses the impact of aid on the value-added in the service and industrial sector testing the Dutch Disease concept. The study aims at uncovering aid-related economic imbalances in developing countries through the analysis of the sector and exchange rate better.

2. Theoretical and Empirical Literature Review

This section focuses on theoretical foundations and the facts of Dutch Disease in third world countries with reference to the macroeconomic distortions brought about by foreign aid. Theoretical explanations of the fundamental mechanisms between inflows of assistance and currency appreciation and sectoral reallocation are synthesized here. This study goes a lot further in examining real data on the role played by aid in the RER, services and industrial value added.

2.1 Theoretical Foundations of Dutch Disease and Aid-Led Inflows

Dutch Disease model indicates that when a large inflow of foreign currency is realized, this may increase the real exchange rate (RER) and reorganize sectors. In line with the classic model which is the booming sector, foreign investments augment local consumption and demand of non-tradable commodities, escalating their price and RER. Since factors of production would be transformed to non-tradable products the output of production and industry will decline (Corden & Neary, 1982). More surveys elaborate on how factor mobility, supply restrictions, and policy interventions will impact on the macro-outcomes (Corden, 1984).

Early theoretical work that applies this approach to foreign aid posits that, similar to a boom, it can strengthen the RER and decrease tradables if the spending on non-tradables is dominated by aid or if production capacity is outpaced by absorption (Van Wijnbergen, 1986). According to aid-macroeconomics, three primary elements determine outcomes: Issues include aid mix (consumption vs. investment) and public investment efficacy, Monetary-fiscal management-sterilization, reserve buildup

This theory proposes that medium-term productivity improvements can offset competitiveness losses, even while short-term appreciation pressures are still present (C. S. Adam & Bevan, 2006). The impact and longevity of RER movements and tradables performance are heavily influenced by policy decisions and investment efficiency. Low-income countries' dynamic macro models also indicate that increasing aid levels can lead to pressures similar to the Dutch Disease (Berg et al., 2013; Prati & Tressel, 2006).

Relevance to our goals: A Dutch Disease exists when the aid flows consistently favor the RER, and when the assumption is that the aid causes an increase in services (non-tradables) and a decline in industry/manufacturing, it is said that the assumption is valid. The principal mechanism of Dutch disease is illustrated in the figure 1.

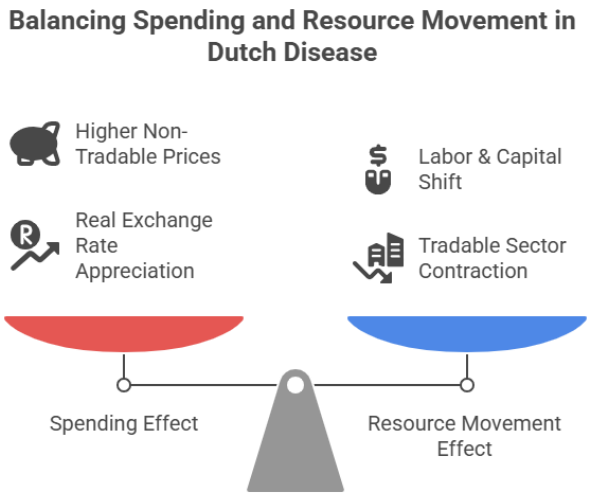

Fig. 1: Conceptual framework of Dutch Disease

2.2 Aid and the Real Exchange Rate

Results from empirical studies examining the aid-RER link are inconsistent, which is attributable to variations in sampling, identification methods, exchange rate regimes, and endogeneity treatment.

In line with the expectations of the Dutch Disease, panel studies which focus on regions reliant on aid when they are dependent often confirm that increased inflows of aid are associated with increased RER appreciation. Ouattara and Strobl (2008) have established that the inflows of assistance into the CFA franc

zone give positive payoffs between the RER appreciation and the assistance inflows, although the effects can be offset by proper policies. Further evidence that exists in other states indicates that the cases of aid being connected to RER movements do exist, though the values differ according to the conditions (Elbadawi et al., 2008).

Other studies suggest that in aid, RER was valued in short-run, in minor or conditional distribution when aid funds imports (capital goods) or macro policy absorbs inflows arbitrarily. Research has indicated that net domestic assets administration of the monetary and fiscal policies can reduce the externalities of aid such as decreased exports through macro-policy (Prati & Tressel, 2006). Mouneer (2023) explores the phenomenon of Dutch Disease in the emergent economies, focusing specifically on the FDI, foreign aid, and remittances. High inflows hurt the tradable sector and over value the exchange rate. We have explained through studies that our initial objective is true as aid does not always alter currency rates in developing countries. The regime, expenditure, supply restriction, and response modes are of significance.

2.3 Aid and Sectoral Outcomes

The second line of inquiry checks if incoming capital changes the production structure away from tradables, providing a more direct evaluation of Dutch disease.

2.3.1 Industry/Manufacturing Contraction Channel

One of such findings examines the prospects that aid reduces competitiveness by narrowing down growth in exporting manufacturing industry. The fact that the study considers both national and industry-specific variations makes it conclude that aid is always a drag to manufacturing growth and provide some evidence that is consistent with the fact that RER appreciation is a conduit (Rajan & Subramanian, 2011).

2.3.2 Services/Non-Tradable Expansion Channel.

Theoretically, non-tradables (usually services) widen and tradables shrink but in most of the published works Dutch disease is measured by the manufacturing or exports. It has a tendency of being indirectly measured in terms of RER and manufacturing/export outputs as opposed to service value. Nevertheless, foreign aid inflows can increase demand for non-tradable sectors, particularly services, leading to resource reallocation from tradable sectors such as manufacturing and agriculture toward services (public services, building) (Rajan & Subramanian, 2011). It is on this account that we will also be examining the impact of the aid on the value addition of services over and above the industry value added in an attempt to test the sectoral hit or miss prediction of the theory.

Not all the outcomes of industrialisation mean deindustrialization. Hence, productivity or infrastructural enhancements can offset RER pressures and tradables at the long-run implying that the short-run effects of the Dutch Disease may not make permanent harm to the structures in the long-run (C. S. Adam & Bevan, 2006). Berg et al. (2013) and Prati and Tressel (2006) assert that the sectoral effects may vary in relation to the nature of aid (investment vs. consumption), its levels of absorption, and strategic management.

3. Data and Methodoloy

Emerging markets should examine the feasibility of imported funds so as to realize the objectives in the long run. However, amongst the critical factors which contributed to the inefficiency of these foreign assets is the Dutch disease. The study seeks to quantify the impacts of FDI, AID, and MR on the Dutch disease in the developing countries. The study was done on 74 developing countries between 2000 and 2022. The primary source of data is World Development Indicator by World Bank..

3.1 Model Specification

This is a panel-data research design that explores the empirical relationship between foreign aid allocation and real exchange rates through sectoral production statistics as the important macroeconomic indicators of the World Bank. The econometric specification does not only take care of the direct impact of aid on

economic performance but it also captures the interaction effect between aid and exchange rate dynamics. The current study seeks to determine the presence of the Dutch Disease affecting the life of the low-income countries when foreign assistance is introduced, and the degree to which the nexus is muted by other macroeconomic and institutional factors.

$$Y_{i,t} = \beta_Y Y_{i,t-1} + \beta_X X_{i,t} + \beta_Z Z_{i,t} + \mu_t + v_{i,t} \qquad (1)$$

The subscripts i and t, which represent nations and time, respectively, are indicated below. For the purpose of proxying the real effective exchange rate, the variable Y represents the price level ratio of the PPP conversion factor (GDP) to the market exchange rate. The variable $X_{i,t}$ represents foreign aid as a percentage of gross national income, and $Z_{i,t}$ is a vector of exogenous factors that have the potential to impact exchange rate. μ_t, which stands for time-fixed effects, are used to capture the influences of the business cycle, whereas $v_{i,t}$ represents the error term. According to the findings of empirical study, it is possible for the exchange rate during period t to rely on $Y_{i,t-1}$ in order to represent the consequences of convergence. Consequently, it is predicted that β_Y will be negative. For the purpose of assessing the impact of foreign aid on the exchange rate, the term $X_{i,t}$ is incorporated, and it is predicted that the coefficient β_X will either be positive or negative. The subset of the vector of the control variables $Z_{i,t}$ was selected in order to take into consideration not only their relevance as drivers of exchange rate but also their capacity to impact the exchange rate in order to assist inflows. The following control variables are included in the vector: foreign aid (FA), personal remittances, received as a percentage of GDP (REM), broad money (BM), foreign direct investment (FDI), general government final consumption expenditure (GEXP), Rule of law (RL), and trade (TRD). These variables are included while taking into consideration the indicators that have been derived from empirical research in this area.

So, the final equation 1.1 is

$$REER_{i,t} = \beta_\circ REER_{i,t-1} + \beta_1 FA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 REM_{i,t} + \beta_4 BM_{i,t} + \beta_5 GEXP_{i,t} + \beta_6 TRD_{i,t} + \beta_7 RL_{i,t} + \mu_t + v_{i,t} \qquad (1.1)$$

After preliminary study, this study will examine the Dutch disease theory in emerging nations' tradable and non-tradable sectors. Foreign aid can encourage exchange rate appreciation and damage tradable businesses including agriculture, manufacturing. Misallocating resources by foreign aid's effect on service sector value-added relative to tradable industries may cause macroeconomic imbalances. An econometric model of aid inflows and service sector performance will use service-sector value-added as the dependent variable and foreign aid as the explanatory component. To distinguish government and aid effects on growing nations' service sectors, foreign direct investment, inflation, interest rates, and governance quality will be evaluated.

$$SVA_{i,t} = \beta_\circ SVA_{i,t-1} + \beta_1 FA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 REM_{i,t} + \beta_4 BM_{i,t} + \beta_5 GEXP_{i,t} + \beta_6 TRD_{i,t} + \beta_7 RL_{i,t} + \mu_t + v_{i,t} \qquad (2)$$

We will further investigate by using Price level ratio of PPP conversion factor (GDP) to market exchange rate (REER) as independent variable to see the impact on service value added.

$$SVA_{i,t} = \beta_\circ SVA_{i,t-1} + \beta_1 FA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 REM_{i,t} + \beta_4 BM_{i,t} + \beta_5 GEXP_{i,t} + \beta_6 TRD_{i,t} + \beta_7 RL_{i,t} + \beta_8 REER_{i,t} + \mu_t + v_{i,t} \qquad (2.1)$$

Now we will further explore this relation more critically by adding interaction term of foreign aid and exchange rate to see how the effect of foreign aid on the service sector changes with varying levels of exchange rate.

So, now our model is

$$SVA_{i,t} = \beta_\circ SVA_{i,t-1} + \beta_1 FA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 REM_{i,t} + \beta_4 BM_{i,t} + \beta_5 GEXP_{i,t} + \beta_6 TRD_{i,t} + \beta_7 RL_{i,t} + \beta_8 REER_{i,t} + \beta_9 FA * REER_{i,t} + \mu_t + v_{i,t} \qquad (2.2)$$

This paper shall take the rigorous form of interrogating the Dutch Disease hypothesis in emerging economies

by concentrating on the tradable sector where international competitiveness is feasible in tradable sectors such as industrial value addition including manufacturing, agricultural and extractive sectors of the tradable sector. These businesses are particularly prone to Dutch Disease dynamics in such a manner that their fortunes are suffering under the acute impacts of currency exchange rate changes and changes in foreign demand.

So, our GMM equation is

$$IVA_{i,t} = \beta_{\circ} IVA_{i,t-1} + \beta_1 FA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 REM_{i,t} + \beta_4 BM_{i,t} + \beta_5 GEXP_{i,t} + \beta_6 TRD_{i,t} + \beta_7 RL_{i,t} + \mu_t + \nu_{i,t} \quad (3)$$

We will further investigate by using Price level ratio of PPP conversion factor (GDP) to market exchange rate (REER) as independent variable to see the impact on industry value added.

$$IVA_{i,t} = \beta_{\circ} IVA_{i,t-1} + \beta_1 FA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 REM_{i,t} + \beta_4 BM_{i,t} + \beta_5 GEXP_{i,t} + \beta_6 TRD_{i,t} + \beta_7 RL_{i,t} + \beta_8 REER_{i,t} + \mu_t + \nu_{i,t} \quad (3.1)$$

Now we will further explore this relation more critically by adding interaction term of foreign aid and exchange rate to see how the effect of foreign aid on the industry sector changes with varying levels of exchange rate.

So,

$$IVA_{i,t} = \beta_{\circ} IVA_{i,t-1} + \beta_1 FA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 REM_{i,t} + \beta_4 BM_{i,t} + \beta_5 GEXP_{i,t} + \beta_6 TRD_{i,t} + \beta_7 RL_{i,t} + \beta_8 PREER_{i,t} + \beta_9 FA * REER_{i,t} + \mu_t + \nu_{i,t} \quad (3.2)$$

3.2 Selection of the Variables

This paper discusses the impact of foreign aid on exchange rates, value added services and industry in the different sectors to establish whether the Dutch Disease is valid among developing economies. We selected the variables which reflect large incoming capital, fiscal policies, macroeconomic constraints, and the institutional variables which influence exchange rates and movement of the resources to and away the one sector according to the Dutch Disease theory and existing empirical evidence.

According to the Dutch Disease theory, foreign aid affects GDP, price level ratio, and exchange rate. Capital inflow has also an impact on the trader and non-trader price using the exchange rates (Corden & Neary, 1982). Exchange rates also have implications in Dutch Disease because aid undermines foreign competitiveness particularly in the industry (Rajan & Subramanian, 2011). Models 2, 2.1 and 2.2 non-tradeable foreign aid is influenced by services. Service sector gains when the appreciation of the currency renders the non-tradable activities more profitable than trade (Corden, 1984). Assessment of non-tradable aid is based on service value. The foreign aid has an influence on trade value added in Models 3, 3.1 and 3.2. The expected real appreciation of the exchange rates would be detrimental to industry and productivity (Sachs & Warner, 2001).

Table 1: Variable Description

Variable	Variable Name	Description	Unit of Measurement
REER	price level ratio of the PPP conversion factor (GDP) with the actual exchange rate	Comparison of the PPP conversion factor to the market exchange rate between the two sovereign states where base country is United State.	Ratio between US and local country
FA	Net ODA received	Official agencies of Development Assistance Committee members, multilateral organisations, and non-DAC nations can aid DAC countries and territories' economic growth and welfare with concessional finance and grants.	% of GNI
FDI	Foreign Direct Investment, net inflows	Obtaining a 10% foreign firm voting stake through net investment flows. Balance of payments includes equity, reinvested earnings, other long-term, and short-term capital.	% of GDP
REM	Remittances	Personal transfers and employee compensations between resident and non-resident households.	% of GDP
BM	Broad money	All the liquid financial instruments held by its entities that hold money (which typically are mediums of exchange, and can be rapidly changed into their nominal value).	% of GDP
GEXP	General government final consumption expenditure	All government spending on consumable goods and services, including staff and defence wages, does not include capital formation.	% of GDP
TRD	Trade	total goods and services exported and imported	% of GDP
RL	Rule of Law	Crime, violence and trust and cooperation of agents with the society laws, the enforcement of contracts, property rights, police and courts.	Estimate
SVA	Services, value added	The economic contribution of a producer, industry, or institution is estimated by subtracting intermediary consumption of goods and services utilised to produce output from the overall value of production.	% of GDP
IVA	Industry, value added	The net output of a sector is the value added when the intermediate inputs are eliminated.	% of GDP

3.3 Empirical Methodology

System Generalized Method of Moments (System GMM) is an extension of difference GMM estimator that is particularly developed to work with dynamic panel data models with a restricted time dimension (T) and a large number of cross-sectional units(N). System GMM of Arellano and Bover (1995) and Blundell and Bond (1998) depends on the estimation of two equations at once, one of them first-differentiated and one of them level. The lagged endogenous variables are used in the diffused equation whereas lagged differences are used in the level equation. This two-system model is effective in situations where a set of explanatory variables varies with time and existence of poorness of standard difference GMM techniques. The econometric challenges that the estimator copes with well with economic and financial panel data are observed individual heterogeneity, endogeneity, autocorrelation, and heteroskedasticity.

System GMM is the best option for dynamic panel estimation since it produces more accurate and efficient estimates than other methods. In cases of nearly-unit-root variable behaviour or considerable fixed effect variance relative to idiosyncratic errors, System GMM estimates are stronger and more exact than fixed effects or difference GMM estimates (Blundell & Bond, 1998). It further has an internal scheme of instrumentation, which minimizes the reliance on invalid or unavailable external instruments. The use of instrument count control, Hansen test and Arellano-Bond autocorrelation tests provide consistent, efficient and theoretically well-founded estimates, and this makes System GMM superior in estimation of contemporary applied panel data studies.

4. Results and Discussion

This paper examines the existence of macro-structural trends in developing countries in relation to economic imbalance and Dutch Disease using the net ODA received as a percentage of GNI. Neither a large foreign inflow of foreign exchange, nor domestic absorption can be satisfied in the canonical Dutch Disease model, so the real exchange rate appreciation and the reallocation of labor and capital out of tradables to non-tradables (the spending effect and resource movement effect) occurs (Corden & Neary, 1982; Corden, 1984). This is because aid can be endogenous to macroeconomic factors and institutions and sectoral performance can be long-lasting which makes the estimations dependent on System GMM which is specifically designed in dynamic panels with possible endogeneity and unobservable heterogeneity (M. Arellano & Bover, 1995; Blundell & Bond, 1998; Roodman, 2009). Empirical analysis consists of statistical and econometric analyses.

4.1 Statistical Analysis

One of such methods is the use of statistical estimation; this is the method that aims at trying to make predictions about the properties of a population based on a sample. The Descriptive statistics uses various measures to describe the statistics, mean, median, variance and standard deviation. Correlation matrix is the image of the association between multiple variables in a small space, which defines the strength and weakness of the links between them. These tools work together in order to help you in understanding patterns and making predictions on the basis of data. Table 2 provides descriptive statistics for the concerned variables while table 3 presents correlation matrix.

Table 2: Descriptive Statistics

Variable	Mean	Std. Dev.	Min	Max
REER	.411	.141	.127	1.123
FA	4.614	5.689	-.642	54.257
FDI	3.762	4.791	-37.172	55.072
REM	6.725	8.102	15.65	53.826
BM	50.751	36.931	6.556	260.618
GEXP	14.170	5.319	2.047	43.482
TRD	71.584	31.607	11.121	220.406
RL	-.477	.562	-1.870	1.348
SVA	50.419	9.121	10.859	94.148
IVA	27.647	10.524	2.391	84.795
FA	4.615	5.689	-.642	54.257
FA*REER	2.087	3.440	-.234	42.062

Table 3: Correlation Matrix

	REER	FA	FDI	REM	BM	GEXP	TRD	RL	SVA	IVA
REER	1									
FA	0.244	1								
FDI	0.018	0.089	1							
REM	0.031	0.139	0.014	1						
BM	0.1004	-0.249	0.054	0.122	1					
GEXP	0.343	0.255	0.049	0.124	0.097	1				
TRD	0.005	0.0130	0.319	0.206	0.276	0.256	1			
RL	0.297	-0.004	0.060	-0.012	0.330	0.224	0.239	1		
SVA	0.347	-0.131	-0.068	0.289	0.347	0.222	0.044	0.363	1	
IVA	-0.257	-0.447	0.047	-0.328	-0.328	-0.121	0.139	-0.158	-0.472	1

4.2 Econometric Analysis

Results to empirically analyze the existence of Dutch Disease and further sectoral analysis are presented in table 4.

Table 4: System GMM Results for empirical analysis

Dependent Variable: Price Level Ratio of PPP Conversion Factor (GDP) To Market Exchange Rate Independent Variable: Net Oda Received (% Of GNI)			Dependent Variable: Service Value Added Independent Variable: Net Oda Received (% Of GNI)						Dependent Variable: Industry Value Added Independent Variable: Net Oda Received (% Of GNI)					
			Baseline		1st		2nd		Baseline		1st		2nd	
Variable	**Coefficient T-Test**	**Prob**	**Coefficient T-Test**	**Prob**	**Coefficient T-Test**	**Prob**	**Coefficient T-Test**	**Prob**	**Coefficient T-Test**	**Prob**	**Coefficient T-Test**	**Prob**	**Coefficient T-Test**	**Prob**
Foreign Aid	-.001 (-5.77)	0.000***	.052 (4.59)	0.000***	.046 (3.12)	0.003***	.027 (3.88)	0.003***	-.093 (-7.56)	0.000***	-.087 (-4.95)	0.000***	-.283 (-4.46)	0.000***
Foreign Direct Investment	.001 (3.31)	0.001***	-.025 (-4.39)	0.000***	-.163 (-3.85)	0.000***	-.214 (-4.38)	0.000***	.012 (2.17)	0.047***	.001 (0.10)	0.920	.046 (1.93)	0.057**
Remittance	-.001 (-0.98)	0.330	.016 0.60	0.550	.022 (1.16)	0.248	.022 (0.95)	0.346	-.027 (-1.99)	0.05**	-.035 (-2.43)	0.018***	-.064 (-3.46)	0.001***
Broad Money	-.001 (-2.10)	0.039***	.018 (4.81)	0.000***	.027 (2.01)	0.048***	.013 (1.33)	0.199	-.003 (-1.73)	0.087*	-.003 (-1.27)	0.207	-.003 (-0.31)	0.756
General Govt. Final Consumption expenditure	.001 (3.05)	0.003***	.156 (6.53)	0.000***	.140 (7.01)	0.000***	.163 (8.38)	0.000***	-.047 (-4.41)	0.000***	-.053 (-4.11)	0.000***	-.032 (-2.34)	0.022***
Trade	-.001 (-3.60)	0.001***	-.003 (-1.52)	0.132	-.021 (-5.18)	0.000***	-.067 (-7.61)	0.000***	.016 (3.88)	0.000***	.018 (3.51)	0.001***	.006 (1.43)	0.157
Rule of Law	.016 (-3.60)	0.000***	.129 0.98	0.333	.487 (1.73)	0.08*	.989 (3.29)	0.002***	-.168 (-2.27)	0.026***	-.291 (-2.67)	0.009***	-.256 (-1.32)	0.190
Exchange Rate					-.830 (-5.41)	0.000***	.599 (2.40)	0.019***			-.187 (-1.68)	0.097*	-.321 (-1.73)	0.088*
Foreign Aid*Exchange rate							-.014 (-0.18)	0.856					.393 (3.72)	0.000***
Cons	.019 (5.48)	0.000***	3.586 (4.77)	0.000***	5.229 (3.59)	0.001***	7.866 (4.96)	0.000***	1.934 (6.17)	0.000***	.331 (4.01)	0.000***	2.386 (2.92)	0.005***
No of Instrument	67		67		65		64		67		67		65	
AR(1)	0.000		0.000		0.000		0.000		0.000		0.000		0.000	
AR(2)	0.110		0.417		0.475		0.616		0.593		0.593		0.638	
Hansen Test	0.536		0.316		0.197		0.366		0.261		0.213		0.301	

4.2.1 Existence of Dutch Disease

The estimated results for model 1.1 suggest that there is a strong negative relationship between the net ODA received and the lower PPP to market exchange ratios (β= 0.001, $p < 0.01$) indicating the existence of Dutch disease. This is used to evaluate the existence of Dutch disease in developing countries. For this purpose, impact of foreign aid on exchange rate is evaluated. Negative sign of Aid coefficient reveals the fact that aid cause exchange rate appreciation in developing countries. REER is calculated as Comparison of the PPP conversion factor to the market exchange rate between the two sovereign states where base country is United State. This definition of the REER implies that an increase in the REER corresponds to a real depreciation. Aid coefficient is expected to be negative because it tends to cause real appreciation by changing the composition of the demand for traded and non-traded goods. Coefficients of FDI, govt. final consumption expenditures and rule of law are positive in first model indicate that these variables cause exchange rate depreciation in developing economies. Whereas coefficient of remittances indicates the fact that higher remittances leads to exchange rate appreciation by making local currency strong.

Diagnostic values indicate that the model is appropriate to inferring dynamic panel GMM, AR (2) p-values is above normal level and the Hansen test of overidentification fails to reject the null hypothesis confirms the validity of system GMM estimation.

4.2.2 Service Value Added (Non-tradables / Absorption Channel)

Second, the non-tradable absorption mechanism of Dutch fiscal arrangements is regressed, which is the foreign aid, and service sector development. aid coefficient for all models of service value added suggest the significant positive association between net ODA and service-sector value added thus the expenditures of aid boost the demand for non-tradable goods. Increased foreign aid correlates with a greater proportion of service value added in emerging nations. This aligns with studies indicating that aid, particularly when allocated locally, enhances demand for non-tradables, frequently encompassing services such as public administration, healthcare, education, and local services. This aligns with some Dutch disease mechanisms: assistance inflows can elevate non-tradable sectors to the detriment of tradable sectors (Rajan & Subramanian, 2011). Due to the fact that the REER coefficient is -0.830, it can be deduced that the value of the service added reduces by 0.830 units for every unit that the REER increases. An increase in the REER shows that the local currency has appreciated in comparison to its trade partners, which results in an increase in the cost of exports and a decrease in the cost of imports. According to economic theory, a country's exports are less likely to be competitive as the value of its native currency increases, which is associated with a higher relative exchange rate (REER). In the event that the nation is a significant exporter of services, this may have a detrimental impact on the value added to services. It portrays that the exchange rate conditions are important in determining marginal assistance effects on services, which justifies the hypothesis that macroeconomic management can influence non-tradeable aid expansion or non-tradeable aid neutralization. Hansen statistics indicate that the instruments are suitable and there is no second-order serial correlation though, model diagnostics indicate the existence of dynamic-panel features.

4.2.3 Industry Value Added (Tradables Competitiveness / Deindustrialization Channel)

The third model is the tradables competitiveness channel of Dutch disease which investigates the correlation between an inflow of foreign aid and industrial value added. When there is a negative value, it is a sign of aid induced deindustrialization. Coefficient of net ODA is negative and statistically significant for the

baseline model as well as for two extended specifications which supports the idea of structural imbalance according to the Dutch disease. Such findings indicate that with the higher influx of foreign aid, industry value added decreases. The drawn conclusion also supports empirically the internalized concept that persistence in foreign inflows may damage the tradables in relative price, reallocation of factors or policy incentives to non-tradables. Other control variables like the trade openness in both specifications is positively and significantly related, which makes the argument that trade enhances the performance of the industry, and government consumption is always negatively and significantly, which makes the argument that government aims to switch to domestic demand and lose the support of the growth of industry based on trade policy. The negative and substantial impact of remittances on the increased parameters implies that further inflows of the entities privately can harm the industry but FDI does not impact the parameters in a direct manner to a great extent. The rule of law negatively impacts industrial value added because better institutional quality promotes efficient natural resource exploitation and attracts investment towards booming sectors, causing a shift of capital and labor away from manufacturing which in turn leads to deindustrialization (Corden & Neary, 1982). In the second model, the conditions of exchange rate are also negative and just slightly significant (p-values are approximately 0.09), and the table does not refer to statistically significant the treatment effect of aid and exchange rate on the industry which means that the negative relationship between the industry and aid is more structural and lasting than transitory exchange-rate. The interaction between foreign aid and the real effective exchange rate (REER) has a positive and significant impact on industrial value added, indicating that foreign aid supports industrial growth when paired with exchange rate movements. In light of Dutch Disease, while exchange rate appreciation can harm tradable sectors, effective foreign aid usage can strengthen industrial capacity, underscoring its positive role in boosting industrial value despite exchange rate fluctuations.

The GMM diagnosis is presumed to be good due to the fact that the AR (2) tests have no serial correlation in the second order and the Hansen tests have no rejected instrument set in the conventional level of significance.

4.3 Discussion:

A merged though conflicting conceptualization of economic imbalance in aid comes with Dutch disease in developing countries in the three model groups. The net ODA is positively related with REER when more complex parameters are taken into account, showing that real appreciation pressures brought about by local price gains against inflow take place. The structural result portrayed in the sectoral models is that the association between aid and value added is negative depicting a tradables crunch and deindustrialization. Nevertheless, the market response in the service industry is specifications-sensitive, which implies that the non-tradables growth can potentially rely on macroeconomic institutions and conditions. The services model indicates a significant interaction between the aid and exchange rate which corroborates this possibility. These data indicators imply that foreign aid can result in macro structural imbalance, especially through the impact it has on the industry but they also show that the effectiveness of absorption channel depends.

The numbers are not complete but acceptable in pointing out an imbalance of a Dutch Disease caused by foreign assistance to the developing economies. The strongest empirical finding that stands out as the most consistent is evidence that aid is negatively associated with industrial value added that tends to support the theory of Dutch Disease. This facilitates the mechanism of competitive pricing of the tradables, which contends that inflows of aid reduce manufacturing and other tradable prices (Corden & Neary, 1982; Rajan & Subramanian, 2011; Rodrik, 2008). More elaborate price-level-ratio forecast practice reveals a

comparative price undertaking in reaction to appreciation, which justifies the statement that aid can alter domestic price outlay even when adjusting the nominal exchange rate remains nascent and is managed (Berg et al., 2013; Edwards, 1989).

A simplistic two-sector Dutch Disease model where the untradeable are growing at the cost of the tradables gets complicated by the negative effect achieved on services-value added. These inflows can change incentives towards less productive activities, increase macroeconomic volatility, create rent-seeking or misallocation in the institutional and structural environment common to most aid recipients. In this case, a more relaxed interpretation as an imbalance, as opposed to pure mechanistic expansion of non-tradables, may take place when both tradables and services that promote increases in productivity are diluted (Acemoglu & Robinson, 2013; Moss et al., 2006; Rajan & Subramanian, 2008). Services channel seems to be contingent on the exchange-rate dynamics as seen in the significant aid exchange-rate interaction in the services model. It aligns with the fact that the absorption capacity and heterogeneity of exchange-rate regimes determine how the inflows are converted into sectoral results (Berg et al., 2005, 2013).

In general, these results are consistent with the empirical evidence suggesting that aid may create undesired macro-structural effects in case it is volatile, significant in comparison with the economy, and not effectively incorporated into a credible macro-fiscal policy (C. Adam, 2003; Berg et al., 2005; Rajan & Subramanian, 2011). However, it does not mean that aid is inherently destructive, but they indicate that the content, predictability, and the policy or institutional atmosphere defines whether aid funds productivity-enhancing investment or initiate relative price pressures and its decline to the sector (Bourguignon & Sundberg, 2007; Collier, 2008).

5. Conclusion and Policy Recommendations

Dutch disease is more challenging to developing countries whose booms of resources are sudden. Based on the natural resource money, the sectoral structure of the economy may be affected, resulting in long-term structural disequilibrium in developing economies. Even though this is especially evident in the emerging economies, some amount of data is available indicating that the adverse impacts can be counteracted by wise use of fiscal instruments or subjective institutional reform. In this manner, the policymakers would focus on stabilizing the exchange rates, diversification of the economy and the effectiveness of the institutions to establish and sustain the consistent economic growth policies in order to mitigate the impacts of negative effects of Dutch disease.

This paper focused on foreign aid and exchange rate changes to investigate the Dutch disease existence in developing nations and their impact on value added in tradable and non-tradable sectors. The Dutch disease hypothesis is supported by empirical analysis despite data limitations. This empirical phenomenon shows that the inflows of foreign aid correlate with huge real exchange rate appreciation in the sample countries inducing the literature-known expenditure effect, and the changed excess relative price regime. The theory is also supported in sectoral study: the value added in the services sector is highly responsive to the inflows of assistance, whereas the industrial sector is relatively less responsive and even not correlated.

Although the results reveal the fact that aid can definitely triggered the aggregate economy activity, it simultaneously shows that the poorly managed aid can exacerbate the existing structural imbalances of developing nations. Consequently, to reduce the Dutch disease effect, any policymaker must pair the foreign aid with actions that would stimulate the productivity and competitiveness of the tradable sectors. Such a two-pronged policy, prudent administration of aids provisions along with specific policies in industrial

relations provide a potential way to continue with long-term, stable growth.

To protect the tradables and reduce the pressure of appreciation, especially at times of foreign inflows, the assistance management should focus on macroeconomic stabilization, and absorption planning. This kind of strategy involves stabilization of spending, harmonization between the monetary and fiscal policy and the assimilation of aid to medium-term fiscal planning to ensure demand does not exceed supply.

Second, there is need to allocate funds for productive purposes instead of consumption purposes so that it will create balance between tradable and non-tradable sector by improving productive capacity.

Finally, finding ways to improve the management of public investments, their purchase transparency, and the institutions of the rule of law can reduce misallocation and change inflows into sustainable structural change, instead of consumable and usurious rents. The inflow influences come in through intermediaries such as institutional quality.

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