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Foreign Capital Inflows and Macroeconomic indicators: Are Developing Economies in the Trap of the Dutch Disease Hypothesis?

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The Dutch disease phenomenon has been related to foreign inflows into emerging economies in particular, including foreign aid, migrant's remittances, and foreign direct investment. A surge in these inflows is expected to yield a rise in the real exchange rate. Recipient countries have seen a decline in industry as a result of the rise in the non-marketable sector and the slump in the marketable sector. This study empirically investigates the mechanisms of real exchange rate adjustments to migrant remittances, ODA, and FDI toward emerging economies. For the analysis covering the years 2001–2020, dynamic panel data approaches, difference GMM and system GMM, are used to investigate the incidence of Dutch Disease in 84 emerging economies. Numerous econometric studies have shown that Dutch Disease does exist in emerging economies. The Dutch Disease theory is supported by an expanded study that has included the empirical analysis of both industrial (marketable) and service (non-marketable) sectors .

Keywords: official development assistance; foreign direct investment; remittance; real exchange rate; dutch disease; panel data models
JEL Classification: C33, F21, F24, F35

Currently, remittances, official development assistance, and foreign direct investment are the three main sources of funding for the development of many developing nations. To support global sustainable development goals, financial inflows to developing nations have substantially expanded in recent years. Because of this, it is not unexpected that many academics and economists have started to become more interested in foreign inflows. The majority of their studies concentrate on how these inflows help the economy thrive, reduce poverty, maintain a healthy balance of payments, improve education, and provide health services for its people. In comparison to foreign direct investment and official development assistance, migrant remittances are significantly more common in poor countries. Migrant remittances are the major cause of earnings for people in developing and low-income economies, helping to sustain prosperous lifestyle there.

The notion of "Dutch disease," commonly referred to as the Gregory Thesis, was expounded upon by The Economist in the year 1977 with the aim of elucidating the phenomenon of the economic decline experienced by the Netherlands subsequent to the unearthing of natural gas deposits in the North Sea during the 1960s. This phenomenon was subsequently noted in the United Kingdom and Australia and subsequently in a plethora of other nations. The Balassa-Samuelson impact theory lends credence to the idea Dutch disease prevalence in a nation (Balassa, 1964). This theory supports the idea that the real exchange rate appreciation of an

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economy results from productivity gap between its traded sector and non-traded sectors. The spending effect mechanism, which is also endorsed by Corden and Neary (1982), predicts that relative improved productivity will result in a rise in labour wages in the context of the traded goods sector, which would in turn cause a price increase in non-traded items. This would lead to an increase in the actual exchange rate, which is determined by the price of marketable to the price of non-marketable.

The basic conceptual framework for examining the link between foreign capital flow and the Dutch disease issue in the recipient country is proposed by Van Wijnbergen (1984) and Corden and Neary (1982). They demonstrate that a rise in foreign currency inflow is responsible for a rise in the income of the recipient country, which would result in a surge in demand for both marketable and non-marketable items, known as the aid-induced spending effect. The price of the non-marketable, which is set locally through the domestic demand-supply market forces, would rise as a result of this spike in demand. The cost of marketable, however, would not alter because it is exogenously set on the global market. Real exchange rates will rise as a result, which will exacerbate the Dutch disease issue in developing nations. A resource movement effect also occurs in conjunction with the aid-induced spending impact, where resources are switched from the production of marketable products to the comparably more expensive production of non-marketable items. A rise in consumer demand and spending capacity for non-marketable goods leads to an increase in the corresponding price and worker's earnings. As a result, resources are diverted away from the sector of marketable goods to the sector of non-marketable commodities. This further contributes to the Dutch disease issue by impeding the growth of exports.

The main objective of this paper is to evaluate the prevalence of Dutch Disease as ramifications of more foreign capital inflows in developing nations by using dynamic panel data techniques. This study particularly answers the following concerns:

1. Is there a long-term relationship between real exchange rate changes in the selected developing economies and foreign exchange inflows (remittances, ODA, and FDI)?
2. Is there any variation in the impact of foreign exchange inflows on the marketable (industrial) sector?
3. Does the sort of foreign exchange inflows have a diverse influence on the non-marketable sector (service)?

Literature Review

The effect of capital inflows on exchange rate movements causing the DD problem is well demonstrated in the available literature. The findings indicate uncertainty with regard to empirical studies conducted specifically for different countries and regions. The empirical literature with regards to the impact of various foreign exchange influx sources on the real exchange rate of the recipient economies is discussed in more detail in the following sections.

Adenauer and Vagassky (1998) examined the link between assistance inflows and the real exchange rate for Burkina Faso, Cote d'lvoire, Senegal, and Togo, using data between 1980 and 1992. A study that evaluated the real exchange rate within the context of the Salter-Swan two-sector model confirmed the possible detrimental impacts of aid on a country's competitiveness. The problem of Dutch Disease is discussed by McKinley (2009) who also evaluated the detrimental consequences of Dutch disease on economic development as a outcome of increased aid influxes to developing nations. Similarly, the study by Ouattara and Strobl (2008) examined the relationship between foreign aid inflows and real exchange rates by

selecting twelve Countries of the CFA France zone. The outcome showed that foreign assistance influx had not generated Dutch Disease in chosen countries and not affected their competitiveness.

According to Kang et al., (2010) there is evidence for Dutch Disease when exports and GDP respond favorably to shocks to the foreign aid system and adversely to real exchange rates in terms of their magnitude. Hasanov (2013) came to the conclusion that Azerbaijan does not suffer from an extreme de-industrialization, but rather from a partial de-industrialization in the non-oil marketable sector, whereas the non-marketable sector significantly strengthened between 2000 and 2007. Study also showed that the "spending effect," which is more significant than the "resource movement effect," has been produced by government spending. Moreover, it was determined that Azerbaijan's real exchange rate has increased as a result of the swift rises in wages and non-marketable goods.

Jongwanich and Kohpaiboon (2013) investigated the relationship between RER and FDI inflows and outflows in Malaysia, Philippines, Singapore, Chinese Taipei, Thailand, The People's Republic of China, India, Indonesia, and the Republic of Korea. The study used biannual data from 2000 to 2009 using a dynamic panel data regression methodology. According to the pertinent findings of the GMM panel data regression analysis, FDI inflows, and outflows, both caused appreciation of the RER, which is evidence of the presence of the Dutch Disease issue in above mentioned emergent Asian nations.

For the four nations (Bangladesh, India, Pakistan, and Sri Lanka), Roy and Dixon (2016) used a fixed effects panel data model to analyze the Dutch disease argument and found evidence for its existence. They also highlighted that trade liberalization may undermine the REER appreciation spurred on by the significant remittance flows.

In a recent study, Ito (2017) used a vector autoregressive model to analyze quarterly data from 2006 to 2014 to determine whether the Dutch disease existed in Moldova. They came to the conclusion that remittance inflows caused the RER to appreciate, but that this appreciation had no impact on remittance flows. According to Javaid and Panhwar (2019), who examined the effect of Dutch disease on Pakistan's economic development, the disease is detrimental to the industrial sector and hinders the creation of output and jobs, which in turn hinders economic growth.

Using a linear dynamic panel data model from 32 countries for the period of 2006 to 2016, Hien et al. (2020) looked at whether Dutch disease existed as a result of increased remittances in Asian developing economies. They investigated the link between remittances and real effective exchange rate and found that a 1% rise in remittances per capita causes an appreciation of the real effective exchange rate (REER) of these countries by 0.103%, which in turn lowers their competitiveness and confirms the prevalence of Dutch disease.

Murshed and Rashid (2020) examined how the actual exchange rate changed in reaction to FDI, ODA, and migrant remittances coming into the four developing South Asian economies of Bangladesh, India, Pakistan, and Sri Lanka. The findings demonstrated that the overall amount of received remittances and ODA increase the real exchange rate, whereas FDI inflows were found to decrease the actual exchange rate. Few studies also highlighted the behavior of aid and remittances particularly in Pakistan (Bashir & Aman, 2021; Yousaf et al., 2022).

This study is attempting to fill the gap in the available literature after reviewing a considerable amount of literature. This study examines the Dutch Disease phenomenon through a detailed investigation of emerging countries' marketable and non-marketable sectors. It focuses on all developing economies rather than a specific region or country.

Method

Data

It is crucial to ascertain whether foreign resources are favorable because they are required for rising economies to achieve their future objectives. However, Dutch Disease is among the major aspect that is identified to slow down the productivity of such foreign assets. Consequently, the main goal of the research is to determine how much international assistance, foreign direct investment, and migrant remittances are accountable for the incidence of Dutch Disease in emerging nations. A 20-year panel dataset (2001-2020) for 84 developing countries from all regions classified as developing by the World Bank makes up the sample for this empirical study. The world development indicator serves as the main data source (World Bank).

Model

To evaluate the Dutch disease phenomenon as a upshot of foreign investment in evolving economies, three models are developed for empirical investigation. The first model looks at how resources from other countries affect the real exchange rate. Other two models are made to evaluate how foreign assets affect the marketable and non-marketable sectors, correspondingly. The service sector is considered as non-marketable sector, in contrast to the industrial sector, which is marketable sector (Piton & others, 2017). The central equations in each model are:

$$ER_{i,t} = \beta_0 ER_{i,t-1} + \beta_1 FA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 PMR_{i,t} + \beta_4 TO_{i,t} + \beta_5 M2_{i,t} + \beta_6 CE_{i,t} + \mu_t + \nu_{i,t} \quad \ldots\ldots\ldots\ldots(1)$$

$$SVA_{i,t} = \beta_0 SVA_{i,t-1} + \beta_1 FA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 PMR_{i,t} + \beta_4 TO_{i,t} + \beta_5 M2_{i,t} + \beta_6 CE_{i,t} + \mu_t + \nu_{i,t} \quad \ldots\ldots\ldots\ldots(2)$$

$$IVA_{i,t} = \beta_0 IVA_{i,t-1} + \beta_1 FA_{i,t} + \beta_2 FDI_{i,t} + \beta_3 PMR_{i,t} + \beta_4 TO_{i,t} + \beta_5 M2_{i,t} + \beta_6 CE_{i,t} + \mu_t + \nu_{i,t} \quad \ldots\ldots\ldots\ldots(3)$$

Where the subscripts i stands for cross-sections while t for time series.
ER = Real Exchange Rate
FA = ODA as a proportion of GNI (Foreign Aid)
FDI = Foreign Direct Investment inflows
PMR = Personal Migrant Remittances
TO = Trade Openness
M2 = Broad Money Supply
CE = Consumption Expenditures by State
μ_t = Time-fixed effects to capture the impact of business cycles
$\nu_{i,t}$ = The error term.
SVA = Non-marketable sector (Service Value Added)
IVA = Marketable sector (Industrial Value Added)

Variable Description:

This section describes the explained and explanatory variables used in this paper. Real Exchange Rate (ER) is dependent variable for model 1. It is quantified by Price level ratio of PPP alteration factor (GDP) to market exchange rate. Price level ratio is also known as the ratio of purchasing power parity (PPP). It is transformed to an exchange rate.

Foreign Aid (FA) is measured by Net ODA as a percentage of GNI. Money from bilateral, multilateral, and non-DAC countries under lenient conditions is included in net official development assistance. Personal transfers and employee compensation are included in personal migrant remittances received (PMR), which is expressed as a proportion of GDP. Private transfers are any monetary payments made or received by households that reside from nonresident families. The components of net inflows of foreign direct investment (FDI), expressed as a percentage of GDP, are capital invested in equity, earnings reinvested, and other long-term as well as short-term capital.

Currency, coins, demand deposits, time deposits, including bank accounts and other deposits, make up broad money (M2) that is measured as a percentage of GDP. It indicates the amount of money in circulation within the economy. All contemporary government spending on general government final consumption is included in general government final consumption expenditure (CE), which is expressed as a percentage of GDP. The total of all imports and exports of goods and services represented as a percentage of gross domestic product is known as trade openness (TO), also expressed as a percentage of GDP.

Value added in mineral extraction, building, manufacturing, gas, and electricity generation is included in industry (including construction) value added (IVA) as a proportion of GDP. Value-added in broad areas such as selling trade, transportation, and administration, as well as in economic, professional, and personal services like property ownership, medical care, and schooling are all included in services, value-added (SVA) as a proportion of GDP. These two variables are dependent variables for models 2 and 3 respectively. Industry value added (IVA) represents marketable sector and service value added (SVA) measures non-marketable sector. World Bank has published this data annually by utilizing all raw data for all developing economies, hence the main source for this data is world development indicator (WDI) developed by World Bank.

Econometric Methodology

This section presents the econometric methodology which is used to empirically investigate the existence of Dutch disease and its macroeconomic effects in developing economies.

Cross-section dependence test:

First, with the suitable cross-sectional dependence tests recommended by Pesaran, Friedman, and Frees test for cross-sectional correlation, the dataset is examined for any potential cross-sectional dependencies (Baltagi et al., 2012). Cross-section dependence may result from spillover effects or known or unobserved spatial effects that are widespread among cross-sections or panels (Baltagi & Hashem Pesaran, 2007). Testing dependencies across cross-sections is crucial because, in the case of such dependencies across panels, first generation panel data unit root tests do not function as intended because the majority of these methodologies for unit root testing presume cross-sectional independence. The efficient understanding of the convergence process of the panel data variables is made possible by such dependency analysis.

Panel causality test:

Test for panel causality, proposed by Dumitrescu and Hurlin is utilized in this research (Dumitrescu & Hurlin, 2012). To more accurately assess the association among regressors and regressand, panel causality tests will be performed in the study.

Estimation Techniques:

The occurrence of Dutch Disease caused by foreign resources in developing economies is investigated using a dynamic panel data (DPD) estimate methodology. The structural design of dynamic panel data is:

$$Y_{i,t} = \alpha_i + \beta Y_{i,t-1} + \gamma X_{i,t} + v_{i,t} \quad (4)$$

Where t = 1, ..., T and i = 1, ..., N

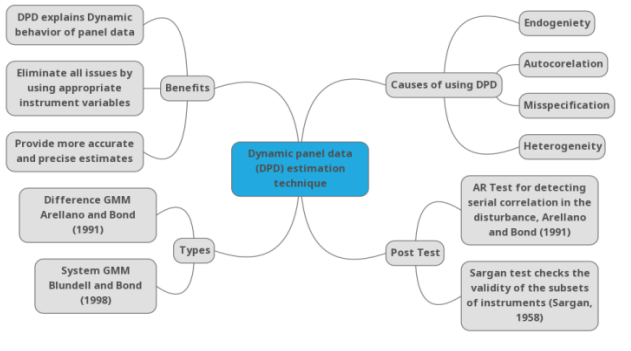

Figure 1 Dynamic panel data estimation methodology

The DPD (Dynamic Panel Data) techniques to estimate β coefficients of all equations include difference GMM by Arellano and Bond (1991) and System GMM by Arellano and Bover (1995) and Blundell and Bond (1998). Arellano and Bond (1991) recommended a process to ascertain serially correlated residuals. The Sargan test recognize the strength of all instruments used in estimation process (Sargan, 1958). Panel data with a wide cross section and a short time period (N>T) are ideally suited to the GMM estimation technique.

Results and Discussions

The actual data presented in this section helps readers fully comprehend the Dutch Disease phenomenon and the mechanism through which it counteracts the beneficial impacts of foreign capital inflows on macroeconomic performance in emerging countries. Three models are estimated using empirical study. An empirical finding to determine whether Dutch Disease exists in developing economies is ER appreciation or depreciation as an outcome of increased foreign capital inflows. A second empirical analysis is then conducted for other two models to determine how foreign capital inflows impact the expansion of both industrial (marketable) and Service (non-marketable) sectors. Due to the larger number of cross sections in panel data, the cross-sectional dependency test is applied to the data. The cross-sectional independence in the dataset used in this study is statistically supported by the cross-sectional dependency analyses results, which are presented in Table 1.

Table 1

Cross-sectional dependence Test

Test	Model 1 Statistic	Model 2 Statistic	Model 3 Statistic
Pesaran's Test of Cross-sectional independence	31.780 (0.000)	2.920 (0.004)	7.139 (0.000)
Frees' Test of Cross-sectional independence	15.103 (0.169)*	12.78 (0.1695)*	10.99 (0.1695)*

Friedman's Test of Cross-sectional independence	194.81 (0.000)	35.629 (1.000)*	50.99 (0.998)*

Note: p-values are in parenthesis. * indicates the acceptance of null hypothesis of cross-sectional independency.

Table 2 presents the outcomes of the causality test. The estimated results support the hypothesis that increases in FA and FDI in developing economies are what first cause ER movements.

Table 2.
The Dumitrescu and Hurlin (2012) granger non causality test results

Dependent variable	Independent variables								
	ER	PMR	FA	TO	M2	FDI	CE	SVA	IVA
ER	-	3.18775 (0.0014)***	2.61100 (0.009)**	4.72674 (0.000)**	6.33009 (0.000)**	2.13069 (0.0331)**	2.91739 (0.0035)***	3.66386 (0.000)**	5.79113 (0.0000)***
PMR	9.54911 (0.000)***	-	6.13999 (0.000)**	6.77512 (0.000)**	9.18406 (0.000)**	1.58408 (0.1132)	6.31632 (0.000)**	5.94450 (0.000)**	5.54639 (0.000)**
FA	9.39612 (0.000)***	7.45288 (0.000)**	-	5.88927 (0.000)**	5.75881 (0.000)**	3.25221 (0.0011)***	8.59032 (0.000)**	1.30646 (0.1914)	5.49245 (0.000)**
TO	6.21339 (0.000)***	3.65516 (0.0003)***	2.45694 (0.0140)**	-	6.50261 (0.000)**	2.77477 (0.0055)**	5.71205 (0.000)**	7.88773 (0.000)**	3.30272 (0.0010)***
M2	4.59322 (0.000)***	2.38791 (0.0169)**	0.53128 0.5952	7.09236 (0.000)**	-	0.48363 0.6287	5.81528 (0.000)**	3.94888 (0.000)**	4.01129 (0.000)**
FDI	1.70556 (0.0881)	2.63021 (0.0085)***	4.94560 (0.000)**	4.52588 (0.000)**	3.25723 (0.0011)***	-	4.73028 (0.000)**	5.55042 (0.000)**	3.68061 (0.0002)***
CE	6.74711 (0.000)***	2.05005 (0.0404)**	2.69629 (0.0070)***	3.28767 (0.0010)***	8.86279 (0.000)**	4.45567 (0.000)**	-	5.99896 (0.000)**	5.40104 (0.000)**
SVA	8.47730 (0.000)***	2.70271 (0.0069)***	3.51055 (0.0004)***	5.36494 (0.000)**	4.68728 (0.000)**	5.58268 (0.000)**	6.62047 (0.000)**	-	3.65017 (0.0003)***
IVA	9.13271 (0.000)***	5.28647 (0.000)**	2.16129 (0.0307)**	6.34881 (0.000)**	5.00550 (0.000)**	4.09437 (0.000)**	6.68248 (0.000)**	3.64150 (0.0003)***	-

Notes: *** and ** indicate that the coefficients are significant at the 1% and 5% levels of significance, respectively. P-values are presented in parentheses.

Dynamic panel data analysis is utilized to produce the estimated coefficients for all Models. For this purpose, the GMM estimator, a panel data estimation technique, is employed in this study. Both difference GMM (Arellano & Bond, 1991) and system GMM (Blundell & Bond, 1998) are used to test the robustness of estimates. Tables 3 show the results of the difference GMM, whereas Tables 4 show the results of the system GMM.

Table 3
Estimated results based on Difference GMM

One-Step Difference GMM			
Variables	Dependent variable		
	ER (DUTCH DISEASE)	SVA (NON-MARKETABLE)	IVA (MARKETABLE)
PMR	-0.036 (-0.53)	0.57*** (2.38)	0.438** (1.92)
FA	-0.08*** (-2.42)	0.094** (1.95)	-0.154*** (-3.26)
TO	0.01 (1.15)	-0.063*** (-4.70)	0.052*** (3.77)
FDI	-0.043** (-1.76)	-0.037 (-0.43)	-0.261*** (-3.30)
M2	-0.027** (-2.27)	0.09*** (4.77)	-0.136*** (7.62)
CE	-0.05* (-1.53)	0.232*** (4.58)	-0.215*** (-4.32)
No. of observations	1280	1275	1274
No. of instruments	70	37	37
AR(1) test (p-value)	0.000	0.002	0.000
AR(2) test (p-value)	0.432	0.330	0.410
Sargan test (χ^2)	0.052	0.066	0.021

*Note: ***, ** and * indicate 1%, 5% and 10% level of significance and t-statistics are in the parenthesis.*

Table 4
Estimated results for RER based on System GMM

One-Step System GMM			
Variables	Dependent variable		
	ER (DUTCH DISEASE)	SVA (NON-MARKETABLE)	IVA (MARKETABLE)
PMR	-0.011 (-0.44)	0.13*** (2.23)	-0.15*** (-2.95)
FA	-0.01 (-0.47)	0.028 (1.05)	-0.11*** (-4.15)
TO	0.011** (1.72)	-0.014*** (-2.95)	0.014*** (3.27)
FDI	-0.053* (-1.50)	0.06 (0.97)	0.004 (0.07)

M2	-0.002*	0.014***	-0.007***
	(-1.37)	(3.90)	(-3.50)
CE	-0.01	0.065***	-0.027***
	(-1.02)	(3.48)	(-2.28)
No. of observations	1367	1362	1361
No. of instruments	71	72	72
AR(1) test (p-value)	0.000	0.000	0.000
AR(2) test (p-value)	0.519	0.416	0.348
Sargan test (χ^2)	0.425	0.037	0.046

*Note: ***, ** and * indicate level of significance at 1%, 5% and 10% while t-statistics are presented in the parenthesis.*

The impact of foreign inflows (PMR, FA, and FDI) on resource reallocation among the marketable and non-marketable sectors is examined in this section. The estimated coefficient for PMR shows that one unit change in PMR leads to appreciating ER by 0.011%, improvement in non-marketable sector (SVA) growth, and reduction in marketable sector growth (IVA). It separates the resource mobility effect of remittances from the spending effect. The Dutch Disease is seen as an increase in the spending power of remittance-receiving households that leads to amplified demand for services, causing high prices in the non-marketable sector. This causes a shift in labor and capital to the non-marketable sector at the expense of the marketable goods sector, lowering export competitiveness. By allocating funds to the progress of non-marketable goods and services in emerging economies, remittances have been linked negatively to the claim that they have led to the decline in competitiveness in essential exports (Lartey, 2008; Meyer & Shera, 2017).

The results of diff-GMM and sys-GMM are identical in this regard (Adu & Denkyirah, 2018). The presence of Dutch Disease is perceived in that remittances and foreign aid have decreased the marketable sector, as evidenced by PMR and FA estimates. Similarly, studies demonstrate that a one-unit increase in FDI corresponds to a 0.043 percent increase in ER, indicating the symptoms of Dutch Disease in emerging economies (Cambazoglu & Günes, 2016).

The association among trade openness and the ER can be clarified by the fact that as the real exchange rate increases, native goods become more luxurious to consumers abroad, which reduces demand. As a result, imports rise unless the government raises the cost of such products through tariffs or finds other ways to prevent their entry.

Conversely, an overvalued exchange rate makes imported marketable goods cheaper than domestic ones (e.g., quotas). According to Edwards (1988), due to two opposing impacts, a substitution effect and an income effect, trade openness does not appear to have a distinct impact. When marketable and non-marketable goods are considered alternatives, the substitution effect outweighs the income effect. Furthermore, a comprehensive study provided an inter-temporal model of the real exchange rate that supports to the same findings. The notion that the income effect is not dominating Khan and Ostry's (1992) model leads to a common agreement.

Conclusion and policy implications

This study investigates how foreign inflows affect the actual exchange rate. With data for 84 emerging economies from 2001 to 2020, Difference GMM and System GMM panel data estimate techniques are used for this objective. Several diagnostic tests are employed to evaluate the data. Finally, it is stated that while marketable sector expenses drop and resources migrate to non-marketable sectors, foreign investment in emerging economies increases non-trading sector expenses. As a result, emerging economies' real exchange rates rise. The consequences of resource allocation and spending effect support the manifestation of Dutch Disease in emerging economies. ODA and migrant remittances are observed to be the core drivers of Dutch Disease. In the end, it must be acknowledged that a country's competitiveness is determined by a variety of factors, including its real exchange rate. To lessen the consequences of foreign inflows on competitiveness loss, policymakers must focus on both external and internal competitiveness improvements. By using fiscal policy carefully, the impact of foreign inflows on competitiveness can be further reduced. Steps toward achieving this goal include making the tax system leaner and more transparent and enhancing labour productivity through skill-upgrading initiatives. To reach their ultimate goals, developing economies should thoroughly examine their macroeconomic challenges and make use of foreign inflows. Instead of being consumption-driven, economies should be production-driven. Import taxes can be raised significantly to slow the growth of the non-marketable sector. More amenities for traders and marchers are needed to improve the marketable sector and limit the risk of Dutch disease.

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