Zanco Journal of Human Sciences (ZJHS)
ISSN (Print):2218-0222
ISSN (Online): 2412-396X

Vol.28 Issue 2 2024
ID No.1544 (PP 279- 300)
https://doi.org/10.21271/zjhs.28.2.16

Research Article

Measuring and Analyzing the Impact of Some Macroeconomic Variables on Exports in Emerging Countries for 2000-2020: A Panel Data Analysis

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Received 02/10/2023
Accepted 25/01/2024
Published 15/04/2024

Keywords:
some macroeconomic variables,
exports,
emerging economies,
panel data analysis.

Abstract

This study examines the impact of some macroeconomic variables and exports in emerging economies from 2000 to 2020. Using panel data analysis, they investigate how fluctuations in exchange rates, inflation, and interest rates influence the exports of diverse emerging economies. They estimate these effects by employing panle regression, fixed effects, and random effects models and employing statistical tests to select the appropriate model. Our analysis uncovers significant variations in how exchange rates, inflation, and interest rates impact exports across emerging economies. The Fixed Effects Model proves most suitable, highlighting individual-specific effects that shape each country's export behaviours. Changes in exchange rates were linked to decreased exports, indicating a negative relationship. Similarly, alterations in interest rates showed a negative correlation with exports, suggesting that higher interest rates were associated with lower export levels. Conversely, fluctuations in inflation rates demonstrated a positive connection with exports, implying that increased inflation rates were linked to higher export volumes. This study contributes to our comprehension of how macroeconomic factors influence exports in emerging economies, providing valuable insights for policymakers, trade professionals, and researchers aiming to strengthen export competitiveness and sustainability.

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Introduction

In the realm of economic development, emerging economies frequently demonstrate swift and dynamic expansion, rapid industrialization, and notable advancements across diverse sectors, all pivotal factors contributing to their overall economic progress. These economies are expected to achieve annual growth rates of 8 to 10 percent over the next few years, while developed economies are anticipated to grow at around 2 percent during the same period. The term "emerging" signifies that these economies are transitioning from lower-income, less industrialized states to becoming more advanced and technologically sophisticated. This growth is driven by urbanization, increased industrial output, technological advancements, and expanding consumer markets. Although emerging economies often face unique challenges, their fast-paced growth presents opportunities for businesses and investors to tap into burgeoning markets. Hence, we can point out that there is still a gap in the influence of macroeconomic factors on export behaviours in emerging countries. This knowledge gap requires further research to understand the interlinkages and mutual effects of these factors on export dynamics.(Guillén & García-Canal, 2013, p. 14). Antoine W. Van Agtmael coined the term "emerging economies" to describe a group of developing countries with middle-to-higher incomes. According to Dow Jones' 2008 report, 21 such economies are open to foreign investors in securities trading. The term has evolved over time and now encompasses nearly all developing countries with a per capita income situated between low and middle levels, as explained in Investopedia's 2005 article. However, within the category of emerging markets, there are different stages of "emergence" based on the pace of growth and industrialization. Countries are classified into advanced emerging economies and secondary emerging economies. Furthermore, labels like BRIC and EM have emerged to describe the most significant developing nations.

These economies fall within the developing nation category and are open to foreign investors participating in securities. (Baker & Hart, 2009, p. 587). The emerging economy is of great importance in terms of the proportion of international trade, which accounted for nearly 40% of global exports in 2008, while it was under 30% in 1990. As emerging markets become more prominent in global trade, it is important to understand how exchange rate passing and pricing behaviour in the market affect global inflation dynamics. The elasticity of trade rates for exchange rates directly affects trade volumes, and changes in exchange rates can affect the balance of trade. In advanced economies such as the United States, the decline in exchange rate passing may be attributed to the pricing-to-market strategies used by some emerging markets affected by the 1998 financial crisis.(Bussière et al., 2014, p. 147).

Emerging economies exhibit swift economic growth, urbanization, the rise of a burgeoning middle class, and advancements in technology and industry. Exchange rates are a critical driver that can influence export outcomes in unpredictable ways. However, the complex interplay between exchange rates and other macroeconomic variables demands a comprehensive analysis considering cross-sectional and time-series dimensions. This empirical study focuses on the multifaceted connections between exchange rates, macroeconomic factors, and exports within emerging economies from 2000 to 2019. Our research uses a panel data approach to capture the nuanced dynamics at play, examining how fluctuations in exchange rates, inflation rates, and interest rates interact to shape the export trajectories of diverse emerging economies. They employ three-panel data models to provide a comprehensive perspective on the interrelationships and their implications. Furthermore, this study meticulously evaluates the choice of models using statistical assessments like the F and Hausman Specification Tests, aiming to guarantee the dependability and strength of the results. The primary aim of this research is to uncover the complex dynamics that drive exports in emerging economies, providing pivotal insights that hold value for policymakers, business leaders, and researchers. By elucidating the mechanisms through which exchange rates and macroeconomic factors impact export outcomes, the study endeavours to contribute to a deeper comprehension of the challenges and opportunities encountered by these

economies on the global stage. Additionally, it seeks to uncover the correlation between these economic variables. Manufacturing plays a significant role in global GDP and employment, accounting for 16% and 14%, respectively. However, many African countries face challenges related to macroeconomic factors like exchange rates, inflation, taxation, and foreign direct investment. These challenges are often due to high poverty rates and limited economic development. Ultimately, it is crucial to focus on comprehending how these factors influence exports within the state's interactions with other nations. This includes the economic connections facilitated through state-level trade(Nabilah Khairunnisa1, 2022, p. 79). Turkey and Hungary were analyzed, focusing on partnership dynamics, political reconciliation, and shared interests. Certainly, the realm of marketing undeniably holds substantial importance in the realm of these global connections. Its significance becomes pivotal in improving the efficiency of marketing activities among nations, particularly in light of the considerable progress in economic openness. The significance of this research lies in illuminating how certain macroeconomic variables influence the economic progress of emerging nations. Unlike previous studies that did not extensively delve into the connection between macroeconomic factors and export behaviours in these countries, this study fills a crucial gap in understanding. Further investigation is needed to comprehend the interdependence and reciprocal impacts of these factors on exports. The research structure consists of the following sections: Beginning with an introductory overview, the paper delves into a comprehensive review of pertinent literature that encompasses previous studies, discoveries, and analyses within this domain. Another pivotal section pertains to the information and methodology utilised in this study, drawing upon credible sources like the International Monetary Fund, the International Bank, the OECD, and other reputable international references. The methodology employed here introduces a relatively innovative approach, specifically the panel data method, incorporating three distinct models. Furthermore, the discussion section incorporates precise references to the subject matter, followed by a conclusion that encapsulates the findings and final remarks, followed by recommendations derived from the conclusions.

1.Review of Literature

The literature review provides an overview of various empirical studies that explore the complex relationship between exchange rates, inflation, and interest rates that impact exports in different countries. The studies contribute significantly to our understanding of export-led growth strategies. They shed light on the dynamic interplay of economic variables. (Ndou, 2022, p. 4) The study examines the long-term effects of exchange rate changes on export volumes in South Africa during the inflation targeting period. It uses the Johansen co-integration and Engle-Granger approaches and investigates the impact of the 2007 global financial crisis, rising government debt, and the cost of credit post-2008 Q4. The results show that foreign income demand has a larger impact on export volumes than the exchange rate. The study suggests that limiting exchange rate volatility is crucial for reducing export volumes. (Chit et al., 2010, p. 5)..(Eka et al., 2021, p. 621) The study analysed Indonesian exports from 1986–2018 using the autoregressive distributed lag (ARDL) model with the Error Correction Mechanism (ECM) version. Results showed that the exchange rate, world income, and investments positively affect Indonesian exports in the short run, while interest rates also have a positive influence. Cointegration between variables was found, with a 30.93% difference in long-term and short-term export values. (Thuy & Thuy, 2019, p. 1), The study examines the impact of exchange rate volatility on Vietnam's exports using data from 2000–2014. It uses ARDL bounds testing and considers depreciation, foreign income, and export volume. Results show that volatility negatively affects export volume in the long run, while depreciation negatively impacts short-term exports. The study suggests policy implications for managing the exchange rate system.

(Vo et al., 2019, p. 1) This study examines the relationship between exchange rate devaluation, volatility, and exports in Vietnam's manufacturing sector. It focuses on the 2000–2015 period and considers factors like the global financial crisis, Vietnam's World Trade Organization membership, and export partners' geographic structures. The findings show that depreciating Vietnam's currency boosts short-term manufacturing exports, but long-term exchange rate volatility has negative effects. The impact depends on the export type and destination. Policy implications are presented.(Sonaglio et al., 2016, p. 5) The industrial sector is crucial for economic development, but reducing its contribution can slow technological progress. The appreciation of the real exchange rate can reduce Brazilian manufacturers' external competitiveness. This study evaluates the impact of monetary and exchange rate policy changes and total export composition on the Brazilian economy's performance using a structuralist model. (Adebiyi et al., 2009, p. 32) The study examines the impact of oil price shocks and exchange rates on Nigerian real stock returns from 1985-2008. It uses a multivariate VAR analysis and categorizes oil price shocks into sub-samples. Results show significant negative real stock returns due to oil price shocks, suggesting oil price volatility is the cause. The study also reveals that interest rate shocks have a greater impact on the stock market than oil price shocks, leading to systemic monetary policy responses.

(Purwoko, 2021, p. 579) This study examines the impact of inflation on non-oil and gas commodity exports in 2017-2019 through a quantitative correlation analysis. Data was collected from Bank Indonesia's Annual Report and the Port of Surabaya Harbormaster. The analysis used descriptive statistical, classic assumption tests, and simple linear regression tests. The results indicate that inflation significantly positively impacted the exports of non-oil and gas commodities through the Tanjung Perak Port of Surabaya in 2017-2019.(Gylfason, 1999, p. 3) The article examines the determinants of exports and economic growth in 160 countries from 1985–94 using World Bank data. It finds that high inflation and abundant natural resources are linked to low exports and slow growth.

Finally, (Jyoti, 2021, p. 61) The study examines the impact of real exchange rate fluctuations on Indian real exports using the autoregressive distributed lag (ARDL) bound test. Results show that real exports are cointegrated with relative prices, real exchange rate volatility, and world real GDP. Exchange rate volatility has a negative impact, while world GDP and the real effective exchange rate have a significant positive impact on Indian manufacturing exports. Together, these studies enrich our understanding of the complex determinants that steer exports across diverse economic contexts and strategies. The studies mentioned have added valuable insights into exports and their determinants. However, there are still gaps that need further exploration. One such area is the need to broaden the analysis to cover multiple countries and compare the impact of exchange rate fluctuations, inflation, and interest rates on exports across diverse nations. Additionally, delving into the temporal dynamics of these associations over extended periods, potentially using historical datasets, could provide valuable insights into how these relationships evolve and change over time.

2.Data and Methodology

2.1.Data sources

This research employs essential data on the examined variables: exchange rates, inflation, interest rates, and exports within emerging economies. The dataset encompasses the years from 2000 to 2020 and encompasses significant benchmarks in the economic trajectories of these nations. When gathering data for research purposes, our reliance primarily involves selecting a sample based on specific reasons and criteria. One of these criteria is ensuring a relatively stable period between 2000 and 2020. Beyond this timeframe, a state of economic tension emerged due to obstacles in exporting to countries, notably caused by the COVID-19 pandemic. This disruption significantly influenced trade movements. Consequently, we opted

to confine our analysis to the period and sample within the category of emerging countries. To establish authenticity, the data were sourced from reputable institutions, including prominent international databases such as the World Bank, Eurostat, DPS, OECD, and IMF. This timeframe facilitates the comprehension of the interplay between exchange rates, inflation, interest rates, and exports within emerging economies across a designated temporal span.

2.2.Methodology

The main advantage of panel data is that it gives the researcher the financial flexibility to deal with individual behavioural differences within units. It also pertains to a homogenous group of units. Over a specific period (Sul, 2019, p. 7) and can be visually represented as follows:

$$expor_{it} = a_{O\,(i)} + \sum_{j=1}^{n} \beta_{it} exch_{it} + \sum_{j=1}^{n} \beta_{it} inf_{jit} + \sum_{j=1}^{n} \beta_{it} ir_{jit} + u_{it} \ldots\ldots\ldots (1)$$

The equation describes a model that aims to explain how the exports of different countries change over time. It considers a unique intercept for each country and the combined impact of exchange rates (exchange), inflation (inf), and interest rates (ir). The error term (.u-it.) represents the unexplained variation in exports. This model is commonly used in econometric analysis to study the effects of various factors on exports. This model accounts for group-specific heteroscedasticity and underwent significance tests, including the F test, Hausman Specification Test, and another test, to choose the most suitable model among the three types. We estimate the model parameters based on assumptions related to the fixed component, regression coefficients (slope), and the error term (u-it), which incorporate differences due to variations in time and observations. In this paragraph, we will estimate the model parameters using three-panel data models:

2.2.1The regressions (PME), Fixed Effects Model (FEM), and Random Effects Model (REM).

The model explains how exports changes over time with the help of various factors, such as exchange and interest rates. Each country has a unique intercept, and the combined impact of these factors affects exports. The model also includes an error term to account for unexplained variation. This econometric analysis model considers group-specific heteroscedasticity and undergoes significant tests such as the F and Hausman Specification tests. In this section, we delve into the estimation of three distinct models utilizing panel data: the panel data model, the fixed effects model, and the random effects model. Each of these models offers distinct perspectives on the connections among variables, considering variations specific to individuals and particular periods.

Prior to commencing the estimation and assessment of the model, it is imperative to conduct specific tests. These tests play a pivotal role in acquiring dependable outcomes and selecting suitable analytical models, serving as the groundwork for estimating, scrutinizing, and appraising the data, as outlined below:

2.2.2. Correlation coefficient matrix

At the outset, understanding the relationship between the variables is crucial, which can be achieved by computing the matrix of correlation coefficients, as illustrated in the table presenting the estimation outcomes. These results indicate the lack of multicollinearity among the independent variables. The purpose of this test is to identify any substantial correlations among the independent variables. Upon analyzing the correlation matrix results, it becomes evident that the statistical significance of the four variables is considerably lower than expected, signifying an absence of correlation among these variables.

Covariance Analysis: Ordinary				
Included observations: 147				
Correlation				
t-Statistic	EXP01	EXCH	INF	INTE
EXP01	1.000000			

EXCH	-0.321018	1.000000		
	-4.081597	-----		
INF	-0.040316	-0.123496	1.000000	
	-0.485862	-1.498560	-----	
INTE	-0.354101	-0.230670	0.727115	1.000000
	-4.559356	-2.854615	12.75371	-----

Table 1: Correlation coefficient matrix

2.2.3Unit Root Test

	At Level				
		EXCH	INF	INTE	EXP01
With Constant	t-Statistic	0.7998	0.0184	0.0001	0.4106
	Prob.	**0.9915**	**0.0144**	**0.0284**	**0.7467**
		n0	**	**	n0
With Constant & Trend	t-Statistic	0.9181	0.0712	0.0244	0.8926
	Prob.	**0.8538**	**0.0355**	**0.1079**	**0.0853**
		n0	**	n0	*
Without Constant & Trend	t-Statistic	0.7775	0.2703	0.0007	0.8044
	Prob.	**0.9967**	**0.0280**	**0.0166**	**0.9431**
		n0	**	**	n0
	At First Difference				
		d(EXCH)	d(INF)	d(INT)	d(EXP)
With Constant	t-Statistic	0.0450	0.0000	0.0000	0.0104
	Prob.	**0.0177**	**0.0023**	**0.0000**	**0.0141**
		**	***	***	**
With Constant & Trend	t-Statistic	0.1063	0.0025	0.0002	0.0251
	Prob.	**0.0424**	**0.0118**	**0.0227**	**0.0602**
		**	**	**	*
Without Constant & Trend	t-Statistic	0.0034	0.0000	0.0000	0.0008
	Prob.	**0.0098**	**0.0001**	**0.0000**	**0.0029**
		***	***	***	***

Table 2: Unit Root Test

The data was analyzed employing fixed Dickey-Fuller (ADF) tests and Phillips-Perron (P.P.) tests, as presented in Table 1. The results demonstrate variables that display instability at a level but achieve stability when assessed at the first difference.

2.2.4Cointegration

Kao Residual Cointegration Test				
Series: LEXP01 LEXCH LINF LINTE				
Null Hypothesis: No cointegration				
Trend assumption: No deterministic trend				
User-specified lag length: 1				
Newey-West automatic bandwidth selection and Bartlett kernel				
			t-Statistic	Prob.
ADF			-2.837005	0.0023
Residual variance			0.016917	
HAC variance			0.049722	

Table3 : Cointegration.

At a 5% significance level, the presence of cointegration leads to the rejection of the null hypothesis in favor of the alternative hypothesis. The data offers evidence supporting a long-term relationship among these variables, indicating their adherence to the integration criterion.

2.2.4.1. Pooled Data Model (PEM):

Pooled data analysis is a statistical approach that treats all the data observations as belonging to a single combined group, overlooking any unique characteristics or effects associated with individual units (countries, in this case). This method uses standard OLS (Ordinary Least Squares) regression, a commonly used technique for estimating the parameters of a linear model. However, the pooled data model does not consider individual differences or time-invariant unobserved factors that might exist within the data. In the pooled data model, all the parameters ($\beta_1, \beta_2, \beta_3$) are assumed to be constant across different countries (units) and time points. This assumption implies no distinction or variation among countries or periods; it assumes that all the parameters have a consistent pattern across the entire dataset. This concept is known as "complete homogeneity," suggesting that the relationships between the variables are the same for every country and at every time point. In these situations, the error term could correlate with certain independent variables; hence, the model's coefficients would not only be biased but also lack consistency. The mathematical formula for the pooled data model is represented as follows:

$$DLEXPOR_{it} = a_{0i} + \sum_{j=1}^{n} \beta_1 DLEXCH_{it} + \sum_{j=1}^{n} \beta_2 DLINF_{it} + \sum_{j=1}^{n} \beta_3 DLIR_{it} + u_{it} \dots\dots (2)$$

2.2.4.2. Fixed effects Model (FEM): least squares Dummy variable (LSDV)

There is differentiation and variation among the units, meaning that there are individual effects for each country, and this variation is attributed to the characteristics related to the economic structure and the economic framework of each country under study. This assumption contrasts with the first hypothesis, where the slope coefficients are constant across units and time while the intercept varies from one unit to another. The mathematical formula is as follows:

$$DLEXPOR_{it} = a + \delta D_{it} + \sum_{j=1}^{n} \beta_1 DLEXCH_{it} + \sum_{j=1}^{n} \beta_2 DLINF_{it} + \sum_{j=1}^{n} \beta_3 DLIR_{it} + u_{it} \dots \dots ($$
3)

This approach allows for different values of different parameters between cross-section units or between times. The general form is to enter the dummy variable into the regression equation. In this case, "country" represents the entitlements or panels (i), and "year" represents the time variable (t). The first unit represented by the first country is our criterion or reference category. Six dummies representing seven countries were used to avoid the phantom variable trap (perfect polygonal multiplicity) n-1.

$$DLEXPOR_{it} = a + \beta_1 D_{2i} + \beta_2 D_{3i} + \beta_3 D_{4i} + \beta_4 D_5 + \beta_5 D_6 + \beta_6 D_7 + \sum_{j=1}^{n} \beta_7 DLEXCH_{it} + \sum_{j=1}^{n} \beta_8 DLINF_{it} + \sum_{j=1}^{n} \beta_9 DLIR_{it} + u_{it} \dots \dots ($$
4)

2.2.4.3. The random effects model

This model is considered suitable when one of the assumptions required for using the Fixed Effects Model is violated. For the parameters of the Fixed Effects Model to be valid and fair, it is usually assumed that the error variance is the same for all cross-sectional observations (homoscedastic) and that there is no temporal correlation between each group of cross-sectional observations over a certain period. Therefore, the random effects model is used when not all of these conditions are met. The model assumes that the units are random regarding heteroscedasticity, meaning that the Random Effects Model allows units to differ randomly in both slope and intercept coefficients. The main focus of the Random Effects Model is on how to deal with the individual-specific intercept (β_{0i}) as a random variable with an average value (u). Instead of treating (u) as a constant, it is assumed to be a random variable without subscript (i), and the fixed value for a certain country can be expressed as follows:

$$EXPOR_{it} = \beta_{0i} + \sum_{j=1}^{n} \beta_1 EXCH_{it} + \sum_{j=1}^{n} \beta_2 INF_{jit} + \sum_{j=1}^{n} \beta_3 IR_{jit} + \varepsilon_{it} \dots \dots (5)$$

Instead of treating, β_{0i} As fixed, it is assumed to be a random variable with a mean value of, β_0 and the intercept for an individual country can be expressed as;

$$\beta_{0i} = \beta_0 + \varepsilon_{it} \dots \dots \dots (6)$$

where iε_{it} is a random error with a mean value of zero and a variance of V_ε^2
σ . Therefore

$$EXPOR_{it} = \beta_0 + \sum_{j=1}^{n} \beta_1 EXCH_{it} + \sum_{j=1}^{n} \beta_2 INF_{jit} + \sum_{j=1}^{n} \beta_3 IR_{jit} + \varepsilon_{it} + u_{it} \dots (7)$$

$$EXPOR_{it} = \beta_0 + \sum_{j=1}^{n} \beta_1 EXCH_{it} + \sum_{j=1}^{n} \beta_2 INF_{jit} + \sum_{j=1}^{n} \beta_3 IR_{jit} + w_{it} \dots \dots \dots (8)$$

$$w_{it} = \varepsilon_{it} + u_{it} \dots \dots \dots (9)$$

The composite error term$\boldsymbol{w_{it}}$ Consists of two elements:
$\boldsymbol{\varepsilon_{it}}$The cross-section or individual-specific error component.
$\boldsymbol{u_{it}}$The combined time series and cross-section error component because it varies across both individuals and time.
Therefore, we can allude to the research hypotheses that articulate the connection among these variables.
Exchange Rate Impact Hypothesis: Fluctuations in exchange rates significantly affect exports in emerging economies, potentially influencing export competitiveness.Inflation and Interest

Rate Impact Hypothesis: Higher inflation rates or interest rates might detrimentally affect exports in emerging economies.
Individual-Specific Effects Hypothesis: Different emerging economies exhibit unique responses to changes in macroeconomic variables, notably influencing their export behaviours.

3.results

This output represents the result of a panel regression analysis comparing the estimations from three different models: pooled least squares (PEM), fixed effects (FEM), and random effects (REM). The analysis aims to examine the relationship between the dependent variable "dlexor" and several independent variables (dlexch, dlinf, dlir).

Variable		PEM	Fixed Effect	Random Effect
CONCEPT	Coefficient	0.085211	0.089986	0.085211
	t-Statistic	9.341774	10.3011	9.853983
	Prob	0.0000	0.0000	0.0000
ΔLEXCH	Coefficient	-0.67363	-0.844553	-0.673629
	t-Statistic	-7.19802	-8.540021	-7.592691
	Prob.	0.0000	0.0000	0.0950
ΔLIR	Coefficient	-0.02244	-0.020923	-0.022439
	t-Statistic	-2.63972	-2.591736	-2.784456
	Prob.	0.0093	0.0106	0.0061
ΔLINF	Coefficient	0.058414	0.058414	0.060993
	t-Statistic	3.59252	3.621249	3.789498
	Prob.	0.0005	0.0004	0.0002
R-squared		0.374832	0.462923	0.374832
F-statistic		27.1805	12.45012	27.1805
Prob(F-statistic)		0.0000	0.0000	0.0000

Table 4: The results of the regression of each of the three models (PEM, FEM, and REM)

The results mentioned align with certain aspects of economic theory:

1. Exchange Rates Impact and Export Dynamics: It is generally recognized in economic theory that changes in exchange rates can influence export levels. When a country's currency appreciates (exchange rates increase), its exports may become relatively more expensive for other countries, leading to decreased export volumes. Addressing currency fluctuations is important for maintaining export stability, as these fluctuations can impact the competitiveness of a country's goods in the international market.
2. Interest Rates Impact: Economic theory supports the idea that alterations in interest rates can affect exports. Higher interest rates tend to increase borrowing costs, which can lead to reduced investment and consumer spending. This, in turn, may lower overall economic activity, potentially decreasing export levels. Managing interest rate fluctuations through appropriate policies can be crucial for promoting export growth, as lower interest rates might stimulate economic activity and enhance export competitiveness.
3. Inflation and Export Volumes: Economic theory does not consistently support a direct positive connection between inflation rates and exports. Generally, moderate inflation might not have a substantial impact on export volumes. However, in specific circumstances, moderate inflation might positively influence export activities. It's essential to note that high inflation rates could lead to uncertainties in pricing, which might negatively impact export competitiveness.

While these observations broadly align with economic theories, it's important to consider that real-world economic dynamics are complex, and multiple factors can simultaneously influence export levels. Additionally, the impact of these economic variables on exports can vary based on the specific context and conditions of individual economies.
Here is the interpretation of the key components of the output for each model:

3.1. Pooled Estimators Method (PEM):

His method treats all cross-sectional units as if they came from a single group and estimates a single set of coefficients for all units. Assumes that individual-specific effects are not present. Dependent variable: $\Delta lexp$ is the variable you are trying to predict or explain using the independent variables. Coefficients, standard error, t-statistic, and prob.
$\Delta lexch$: The coefficient is -0.673629. For a one-unit increase in the variable lexch, the dependent variable is expected to decrease by around 0.673629 units. The t-statistic is -7.198024, and the p-value is very close to 0, indicating high statistical significance.
Δlir: The coefficient is -0.022439. The dependent variable is expected to decrease by about 0.022439 units for a one-unit increase in the variable. The t-statistic is -2.639720, and the p-value is 0.0093, indicating significance.
$\Delta linf$: The coefficient is 0.060993. For a one-unit increase in the variable linf, the dependent variable is expected to increase by approximately 0.060993 units. The t-statistic is 3.592520, and the p-value is 0.0005, indicating high significance. R-squared and adjusted R-squared: The R-squared value (0.374832) represents the proportion of the variation in the dependent variable explained by the independent variables. The adjusted R-squared value (0.361041) considers the number of predictors and penalizes the model for adding irrelevant variables. F-statistic and Prob (F-statistic): The F-statistic (27.18050) tests the overall significance of the model. The p-value (0.000000) for the F-statistic is very close to 0, indicating high significance.

3.2. Fixed Effect:

$\boldsymbol{\Delta lexch}$: The coefficient is -0.844553. For a one-unit increase in the variable $\boldsymbol{\Delta lexch}$, the dependent variable is expected to decrease by around 0.844553 units. The t-statistic is -8.540021, and the p-value is very close to 0, indicating high statistical significance.
$\boldsymbol{\Delta lir}$: The coefficient is -0.020923. For a one-unit increase in the variable $\boldsymbol{\Delta lir}$, The dependent variable is expected to decrease by about 0.020923 units. The t-statistic is -2.591736, and the p-value is 0.0106, indicating significance.
$\boldsymbol{\Delta linf}$: The coefficient is 0.058414. For a one-unit increase in the variable $\boldsymbol{\Delta linf}$, the dependent variable is expected to increase by approximately 0.058414 units. The t-statistic is 3.621249, and the p-value is 0.0004, indicating high significance. Effects Specification: Cross-section fixed (dummy variables) This indicates that the fixed effect model includes cross-sectional fixed effects (dummy variables for each cross-section) for individual-specific effects. R-squared and Adjusted R-squared: The R-squared value (0.462923) represents the proportion of the variation in the dependent variable explained by the independent variables. The adjusted R-squared value (0.425741) considers the number of predictors and penalizes the model for adding irrelevant variables. F-statistic and Prob(F-statistic): The F-statistic (12.45012) tests the overall significance of the model. The p-value (0.000000) for the F-statistic is very close to 0, indicating high significance.

3.2.1. Add dummy variables

For the intercept to vary among the countries, we run the following differential intercept dummy variable regression model:

$$EXPOR_{it} = \beta_0\beta_1 D_{1i} + \beta_2 D_{2i} + \beta_3 D_{3i} + \beta_4 D_{4i} + \beta_5 D_{5i} + \beta_6 D_{6i} + \sum_{j=1}^{n}\beta_7 EXCH_{it} + \sum_{j=1}^{n}\beta_8 INF_{jit} + \sum_{j=1}^{n}\beta_9 IR_{jit} + w_{it} \dots\dots ($$

4)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.171634	0.024904	6.891897	0.000
D2	-0.095256	0.03247	-2.933687	0.004
D3	-0.047097	0.032315	-1.457428	0.147
D4	-0.129097	0.032987	-3.913634	0.000
D5	-0.091503	0.03187	-2.871168	0.005
D6	-0.088034	0.033101	-2.659519	0.009
D7	-0.120548	0.033581	-3.589774	0.001
DLEXCH	-0.844553	0.098894	-8.540021	0.000
DLINF	0.058414	0.016131	3.621249	0.000
DLINTE	-0.020923	0.008073	-2.591736	0.011
R-squared		0.462923		
F-statistic		12.45012		
Prob(F-statistic)		0.0000		

Table 5: Regression results using dummy variables

Country 1 is the reference category, determined if D2+D3+D4+D5+D6+d7 = 0. Since we have seven countries, we need only six dummy variables to avoid the dummy variable trap, the situation of perfect collinearity.

Variable	Coefficient	intercept	Prob.
Chile (base)	0.171634	0.171634	0.000
India	-0.095256	0.076378	0.004
Malaysia	-0.047097	0.124537	0.147
Mexico	-0.129097	0.042537	0.000
Peru	-0.091503	0.080131	0.005
Thailand	-0.088034	0.0836	0.009
turkey	-0.120548	0.051086	0.001
$\Delta LEXCH$	-0.024846		0.000
$\Delta LINF$	0.347706		0.000
ΔLIR	-0.394458		0.011
R-squared	0.462923		
F-statistic	142.1758		
Prob(F-statistic)	0.0000		

Table 6:The results of each country

Each row corresponds to a variable or country (including the base country, Chile). The coefficients represent the estimated impact of each variable or country on the dependent variable. The intercept refers to the baseline value of the dependent variable when all other variables are set to zero. Chile (base): This row represents the reference category (base country) against which the coefficients of the other countries are compared. The coefficient of 0.171634 represents the average impact on the dependent variable for the base country, while the intercept for Chile is also 0.171634. India, Malaysia, Mexico, Peru, Thailand, and Turkey: These rows represent the coefficients for the respective countries compared to the base country (Chile). Negative coefficients (e.g., -0.095256, -0.129097) indicate that these countries' effects are lower on the dependent variable than the base country. The intercept values (e.g., 0.076378 for India) provide the baseline value for the dependent variable in each

country.$\Delta lexch$, Δlir , $\Delta linf$: These are the coefficients for the variables $\Delta lexch$ (exchange rate), $\Delta linf$ (inflation), and, Δlir (interest rate).
The coefficient values represent the estimated impact of these variables on the dependent variable, holding other variables constant.
R-squared: This value represents the proportion of the variance in the dependent variable explained by the independent variables. An R-squared value of 0.462923 indicates that the model explains approximately 46.29% of the variation in the dependent variable.
F-statistic: This statistic tests the overall significance of the model. The high F-statistic value of 142.1758 and a Prob (F-statistic) value of 0.0000 suggests that the model as a whole is statistically significant.
The results provide insights into the coefficients and intercepts for various countries and variables to the dependent variable. The significance of the coefficients and the high F-statistic value suggest that the model is valuable in explaining the relationships between the variables and the dependent variable. The R-squared value indicates the degree to which the model explains the variation in the dependent variable

3.2.2. Pooled OLS vs. fixed

It is possible to use the comparison between the panel regression model and the fixed effects model. The first model is considered constrained, as we imposed a single constant limit for each country. Hence, we can use the "F" statistic from the following formula:

nearest ***or*** $\frac{(R^2_{UR}-R^2_R)/(N-1)}{\frac{1-R^2_{UR}}{NT-N-K}}$ ... ... **(4)**

As (N-1) represents the number of estimated added parameters, which is (6), and R^2_R is the determination coefficient of the intercept-only model or the constrained value of R^2 obtained from the panel regression model in equation (3-39), assuming equal intercept for each state and $R^2_{UR}$is the determination coefficient of the fixed effects model or the unconstrained value of R^2obtained from the fixed effects model in equation (3) (Gujarati, 2022). The estimation results are as follows:
Given that the calculated "F" value is 3.5537, it is clear that this value is statistically significant for the degrees of freedom (6 in the numerator and 130 in the denominator), surpassing the critical value of 6 or having a p-value lower than or equal to the significance level of 0.05. This indicates the rejection of the null hypothesis and the acceptance of the alternative hypothesis. Consequently, the fixed effects model is suitable for explaining the study's data. Since the Chi-square statistic is significant (p-value <0.05), we reject h0 and conclude that the FE-LSDV model is more appropriate than the panel OLS model. This means that accounting for heterogeneity is important in determining how$\Delta lexch$, $\Delta linf$, and $\Delta linf$ jointly affect $\Delta lexpor$

Wald Test:			
Equation: Untitled			
Test Statistic	Value	df	Probability
F-statistic	3.553767	(6, 130)	0.0027
Chi-square	21.32260	6	0.0016
Null Hypothesis: C(2)=C(3)=C(4)=C(5)=C(6)=C(7)=0			
Null Hypothesis Summary:			
Normalized Restriction (= 0)		Value	Std. Err.
C(2)		0.048159	0.030888
C(3)		-0.033841	0.030961

C(4)	0.003753	0.030954
C(5)	0.007222	0.030937
C(6)	-0.025292	0.031062
C(7)	0.095256	0.032470
Restrictions are linear in coefficients.		

Table 7: Regression results

3.3. Random Effect:

$\Delta lexch$: The coefficient is -0.673629. For a one-unit increase in the variable $\boldsymbol{\Delta lexch}$, the dependent variable is expected to decrease by around 0.673629 units. The t-statistic is -7.592691, and the p-value is very close to 0, indicating high statistical significance.
Δlir: The coefficient is -0.022439. For a one-unit increase in the variable Δlir, the dependent variable is expected to decrease by about 0.022439 units. The t-statistic is -2.784456, and the p-value is 0.0061, indicating significance.
$\boldsymbol{\Delta linf}$: The coefficient is 0.060993. For a one-unit increase in the variable $\boldsymbol{\Delta linf}$ the dependent variable is expected to increase by approximately 0.060993 units. The t-statistic is 3.789498, and the p-value is 0.0002, indicating high significance. Effects Specification: Cross-sectional random, idiosyncratic random. The model uses a random effects specification for cross-sectional and idiosyncratic (individual-specific) random effects. R-squared and adjusted R-squared: These values are similar to those explained earlier, indicating the proportion of the variation in the dependent variable explained by the independent variables. F-statistic and Prob (F-statistic): The F-statistic tests the overall significance of the model. The p-value (0.000000) for the F-statistic is very close to 0, indicating high significance.

3.3.1. Fixed effect vs. random effects

The Hausman test is conducted to determine and select the appropriate final model. This test also relies on the hypotheses mentioned earlier. The test determines the presence or absence of a relationship between the explanatory variables. The essence of the test is to compare the efficiency and consistency of the two models under the null and alternative hypotheses. Accepting the null hypothesis makes the random effects model more efficient and consistent. In contrast, if the null hypothesis is rejected, the fixed effects model is considered more efficient and well-suited.

Correlated Random Effects - Hausman Test				
Equation: Untitled				
Test Summary		Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random		18.525575	3	0.0003
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var (Diff.)	Prob.
DLEXCH	-0.844553	-0.673629	0.001909	0.0001
DLINTE	-0.020923	-0.022439	0.000000	0.0016
DLINF	0.058414	0.060993	0.000001	0.0158
Cross-section random effects test equation:				
Dependent Variable: DLEXP01				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.089986	0.008736	10.30110	0.0000
DLEXCH	-0.844553	0.098894	-8.540021	0.0000
DLINTE	-0.020923	0.008073	-2.591736	0.0106
DLINF	0.058414	0.016131	3.621249	0.0004
R-squared	0.462923			
F-statistic	12.45012			
Prob(F-statistic)	0.000000			

Table 8: The results- Hausman Test

3.3.2. Hausman Test Summary:

Chi-Square Statistic: The calculated Chi-Square statistic is 18.525575. Degrees of Freedom (d.f.): The test has three degrees of freedom. Probability (Prob.): The p-value associated with the Chi-Square statistic is 0.0003. Interpretation: A low p-value (0.0003) suggests that the differences between the coefficients of the fixed effects and random effects models are statistically significant. This indicates that there might be systematic differences between the two models.

4.Discussion

In this research, three distinct models (Panel Data Model - PEM, Fixed Effects Model - FEM, and Random Effects Model - REM) were employed to examine the relationship between several macroeconomic variables and exports across selected countries.

Pooled Data Model (PEM):

- Identified a statistically significant intercept (CONCEPT) with a coefficient of 0.085211, indicating the baseline export level when all independent variables are zero.
- Demonstrated a negative relationship between exchange rate changes (ΔLEXCH) and exports, supported by a coefficient of -0.67363. This indicates that an increase in exchange rates correlates with a decrease in exports.
- Highlighted a negative relationship between interest rate changes (ΔLIR) and exports, denoted by a coefficient of -0.02244, suggesting that an increase in interest rates is associated with a decrease in exports.
- Indicated a positive relationship between inflation rate changes (ΔLINF) and exports, illustrated by a coefficient of 0.058414, signifying that an increase in inflation rates links to an increase in exports.
- Explained approximately 37.48% of the variation in exports collectively through the independent variables, as indicated by the R-squared value of 0.374832.
- Confirmed the overall model's statistical significance through the F-statistic of 27.1805 with a p-value of 0.0000.

Fixed Effects Model (FEM):

- Presented similar coefficients and t-statistics to PEM, affirming consistent relationships between the variables and exports.
- Showcased a marginally improved explanatory power with a higher R-squared value of 0.462923 compared to PEM.
- Maintained the model's statistical significance with a significant F-statistic of 12.45012.

Random Effects Model (REM):

- Exhibited coefficients for the key variables (ΔLEXCH, ΔLIR, and ΔLINF) akin to PEM and FEM, indicating consistent relationships with exports.
- Demonstrated a similar explanatory power to the Pooled Data Model, reflected by the identical R-squared value of 0.374832.
- Supported the model's statistical significance with a significant F-statistic of 27.1805 (p-value = 0.0000).

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5.Conclusions

Based on the analysis and results provided, we can draw the following conclusions: Longitudinal Data Advantage: The research highlights the advantages of using longitudinal data, which allows researchers to account for individual behavioural differences within units over time. This flexibility is crucial for understanding how various factors impact exports. Panel Data Models: The study employs three-panel data models: the panel regression model (PME), the fixed effects model (FEM), and the random effects model (REM). Each model provides unique perspectives on the relationship among variables, considering individual and

time-specific variations. Panel Data Model (PEM): The panel data model treats all data observations as belonging to a single group and assumes constant parameters across different countries and time points. However, it overlooks individual differences and unobserved factors. Relationships between Variables:
identified consistent and significant relationships between exchange rates, interest rates, and inflation rates with exports across all three models. It is established that increases in exchange rates and interest rates negatively influence exports, while inflation rate increments have a positive impact. It suggested a slightly superior performance of the Fixed Effects Model in explaining export variations due to its higher R-squared value, although all models displayed statistical significance in elucidating the relationships between the variables and exports in the selected countries.

6.Recommendations

1.Exchange Rate Impact and Export Dynamics: Recognize the negative relationship between changes in exchange rates and exports. Fluctuations in exchange rates were found to be linked to decreased exports, suggesting the need to address currency fluctuations to support export stability.
2.Interest Rate Impact: Understand the negative correlation between alterations in interest rates and exports. Higher interest rates were associated with lower levels of exports, indicating a need for policies that manage interest rate fluctuations to promote export growth.
3.Inflation and Export Volumes: Acknowledge the positive connection between fluctuations in inflation rates and exports. Increased inflation rates were associated with higher export volumes, suggesting that moderate inflation might positively influence export activities.
4.Moderate Explanatory Power: Recognize that the collective models utilized in this study explained around 37.48% of the export variation. While this signifies moderate explanatory power, it emphasizes the complexity of factors influencing exports and the need for further research.
5.Statistical Model Significance: Acknowledge the statistical significance of the overall model, as confirmed by the F-statistic of 27.1805 (p-value = 0.0000), validating the robustness and reliability of the analysis conducted.
6.Policy and Practice Implications: Utilize these findings to inform policymakers, trade professionals, and researchers about the nuanced influence of macroeconomic factors on export dynamics in emerging economies. This knowledge can aid in formulating policies aimed at enhancing export competitiveness and sustainability.
7.These recommendations highlight the importance of understanding the intricate relationship between macroeconomic variables and export behaviors in emerging economies, urging further exploration and strategic policy formulation to bolster export sustainability and competitiveness.
Research suggests that analysts should examine the impacts of macroeconomic policies adopted by emerging countries, utilizing fiscal and monetary strategies to drive growth and development. Fiscal policies, involving strategic management of spending, taxation, and borrowing, can invigorate economic activity. Increased investment in infrastructure, education, and healthcare can fuel growth by generating employment and enhancing productivity. Concurrently, responsible tax and borrowing practices are essential for sustainability.Moreover, effective monetary policies, overseen by central banks, encompass managing interest rates, money supply, and banking regulations. Lowering interest rates encourages borrowing and investment, fostering economic expansion. Controlled money supply ensures stable inflation levels crucial for sustainable growth. Additionally, robust banking regulations promote stability and facilitate lending, bolstering economic growth.The integration of well-coordinated fiscal and monetary policies enables emerging countries to pursue balanced economic growth, job creation, and overall development, fostering stability and resilience amidst global economic challenges.

7-References

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پێوانەکردن و شیکردنەوەی کاریگەری هەندێک لە گۆڕاوەکانی ئابوری هەمووەکی لەسەر هەناردەکردن لە ئابووریيە تازە سەرهەڵداوە هەڵبژێردراوەکان لە ماوەی 2000 تاکو 2020 شیکردنەوەی زانیاری پانێل.

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پوختە

ئەم لێکۆڵینەوەیە کاریگەری هەندێک لە گۆڕاوەکانی ئابوری هەموەکی و هەناردەکردن لە ئابووریيە سەرهەڵداوەکان لە نێوان ساڵانی 2000 بۆ 2020 تاقی دەکاتەوە. بە بەکارهێنانی شیکردنەوەی داتای پانێڵ، و لێکۆڵینەوە دەکات لەسەر ئەوەی چۆن هەڵئاوسان و ڕێژەی سوود کاریگەری لەسەر هەناردەکردنی ئابووری جۆراوجۆری سەرهەڵداو هەیە. ئەم کاریگەرییانە دەخەملێنرێن بە بەکارهێنانی مۆدێلی لاریبونەوەی تێکڕا یان گشتی و کاریگەرییە جێگیرەکان و مۆدێلی کاریگەرییە هەڕەمەکییەکان و بەکارهێنانی تاقیکردنەوەی ئاماری بۆ هەڵبژاردنی مۆدێلی گونجاو. شیکردنەوەکەمان جیاوازی بەرچاو ئاشکرا دەکات لەوەی چۆن ڕێژەی ئاڵوگۆڕ و هەڵئاوسان و ڕێژەی سوود کاریگەری لەسەر هەناردەکردن لە سەرانسەری ئابووریيە سەرهەڵداوەکاندا هەیە. مۆدێلی کاریگەریەکانەکان جێگیر زۆرترین گونجاوی سەلماندووە، تیشک دەخاتە سەر کاریگەرییە تاکەکەسییەکان کە هەڵسوکەوتی هەناردەکردنی هەر وڵاتێک دروست دەکەن. گۆڕانکارییەکان لە ڕێژەی ئاڵووێری دراو پەیوەست بوون بە کەمبوونەوەی هەناردەکردن، کە پەیوەندییەکی نەرێنی نیشان دەدات. بە هەمان شێوە، گۆڕانکارییەکان لە ڕێژەی سوود پەیوەندییەکی نەرێنییان نیشاندا لەگەڵ هەناردەکردن، و ئاماژە بەوە دەکات کە بەرزبوونەوەی ڕێژەی سوود پەیوەستە بە ئاستی هەناردەکردنی کەمتر. بە پێچەوانەوە، هەڵئاوسان لە ڕێژەی هەڵئاوسان پەیوەندییەکی پۆزەتیڤی لەگەڵ هەناردەکردن نیشان دا، ئەمەش مانای ئەوەیە کە بەرزبوونەوەی ڕێژەی هەڵئاوسان پەیوەستە بە بەرزبوونەوەی قەبارەی هەناردەکردن. ئەم لێکۆڵینەوەیە بەشداری دەکات لە تێگەیشتنمان لەوەی کە چۆن فاکتەرە ئابووریە هەموەکییەکان کاریگەری لەسەر هەناردەکردن دەکەن لە ئابووریيە تازە سەرهەڵداوەکاندا و تێڕوانینێکی بەنرخ دابین دەکات بۆ سیاسەتوانان و پسپۆڕانی بازرگانی و توێژەران کە ئامانجیان بەهێزکردنی پێشبڕکێی هەناردەکردن و بەردەوامییە.

وشە سەرەتاییەکان: هەندێک گۆڕاوی ئابووری هەموەکی، هەناردەکردن، ئابووریيە سەرهەڵداوەکان، شیکردنەوەی داتای پانێڵ.

قياس وتحليل تأثير بعض المتغيرات الاقتصادية الكلية على الصادرات في الاقتصادات الناشئة المختارة خلال الفترة من 2000 إلى 2020: تحليل بيانات اللوحة

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ملخص

الملخص: تبحث هذه الدراسة في تأثير بعض متغيرات الاقتصاد الكلي والصادرات في الاقتصادات الناشئة من عام 2000 إلى عام 2020. باستخدام تحليل بيانات اللوحة ، يدرس البحث في كيفية تأثير التقلبات في أسعار الصرف والتضخم وأسعار الفائدة على صادرات الاقتصادات الناشئة المتنوعة, من خلال استخدام نماذج الانحدار المجمعة والتأثيرات الثابتة والتأثيرات العشوائية واستخدام اختبارات الإحصائية لاختيار النموذج المناسب. يكشف تحليلنا عن اختلافات كبيرة في كيفية تأثير أسعار الصرف والتضخم وأسعار الفائدة على الصادرات عبر الاقتصادات الناشئة. يثبت نموذج التأثيرات الثابتة أنه الأنسب ، حيث يسلط الضوء على التأثيرات الفردية التي تشكل سلوكيات التصدير في كل بلد. وارتبطت التغيرات في أسعار الصرف بانخفاض الصادرات، مما يشير إلى وجود علاقة سلبية. وبالمثل، أظهرت التغيرات في أسعار الفائدة ارتباطا سلبيا بالصادرات، مما يشير إلى أن ارتفاع أسعار الفائدة كان مرتبطا بانخفاض مستويات الصادرات. وعلى العكس من ذلك، أظهرت التقلبات في معدلات التضخم وجود صلة إيجابية بالصادرات، مما يعني أن زيادة معدلات التضخم مرتبطة بزيادة حجم الصادرات. تساهم هذه الدراسة في فهمنا لكيفية تأثير عوامل الاقتصاد الكلي على الصادرات في الاقتصادات الناشئة ، وتوفر رؤى قيمة لصانعي السياسات والمهنيين التجاريين والباحثين الذين يهدفون إلى تعزيز القدرة التنافسية للصادرات واستدامتها.

الكلمات المفتاحية: بعض متغيرات الاقتصاد الكلي، الصادرات، الاقتصادات الناشئة، تحليل بيانات اللوحة .

Sources and references for data:-

c_id	countris	year	EXP	INF	EXCH	INTE
1	Chile	2000	2.4E+10	3.84	539.6	9.83
1	Chile	2001	2.3E+10	3.57	634.9	7.30
1	Chile	2002	2.3E+10	2.49	688.9	4.27
1	Chile	2003	2.7E+10	2.81	691.4	1.80
1	Chile	2004	3.9E+10	1.05	609.5	-1.77
1	Chile	2005	4.9E+10	3.05	559.8	-0.41
1	Chile	2006	6.7E+10	3.39	530.3	-3.87
1	Chile	2007	7.8E+10	4.41	522.5	3.41
1	Chile	2008	7.4E+10	8.72	522.5	12.91
1	Chile	2009	6.4E+10	0.35	560.9	3.55
1	Chile	2010	8.2E+10	1.41	510.2	-3.77
1	Chile	2011	9.5E+10	3.34	483.7	5.59
1	Chile	2012	9.0E+10	3.01	486.5	9.22
1	Chile	2013	8.9E+10	1.79	495.3	6.85
1	Chile	2014	8.6E+10	4.72	570.3	2.12
1	Chile	2015	7.1E+10	4.35	654.1	0.53
1	Chile	2016	7.0E+10	3.79	677.0	0.98
1	Chile	2017	7.8E+10	2.18	648.8	-0.26
1	Chile	2018	8.4E+10	2.43	641.3	2.55
1	Chile	2019	7.8E+10	2.56	702.9	2.32
1	Chile	2020	8.0E+10	3.05	792.7	2.43
2	India	2000	6.1E+10	4.01	44.9	8.34
2	India	2001	6.1E+10	3.78	47.2	8.59
2	India	2002	7.3E+10	4.30	48.6	7.91
2	India	2003	9.1E+10	3.81	46.6	7.31
2	India	2004	1.3E+11	3.77	45.3	4.91
2	India	2005	1.6E+11	4.25	44.1	4.86
2	India	2006	2.0E+11	5.80	45.3	2.57
2	India	2007	2.5E+11	6.37	41.3	5.68
2	India	2008	2.9E+11	8.35	43.5	3.77
2	India	2009	2.7E+11	10.88	48.4	4.81
2	India	2010	3.8E+11	11.99	45.7	-1.98
2	India	2011	4.5E+11	8.91	46.7	1.32
2	India	2012	4.5E+11	9.48	53.4	2.47
2	India	2013	4.7E+11	10.02	58.6	3.87
2	India	2014	4.7E+11	6.67	61.0	6.70
2	India	2015	4.2E+11	4.91	64.2	7.56
2	India	2016	4.4E+11	4.95	67.2	6.23
2	India	2017	5.0E+11	3.33	65.1	5.33
2	India	2018	5.4E+11	3.94	68.4	5.36
2	India	2019	5.3E+11	3.73	70.4	6.89
2	India	2020	5.0E+11	6.62	74.1	4.20

3	Malaysia	2000	1.1E+11	1.53	3.8	-1.09
3	Malaysia	2001	1.0E+11	1.42	3.8	8.85
3	Malaysia	2002	1.1E+11	1.81	3.8	3.30
3	Malaysia	2003	1.2E+11	1.09	3.8	2.91
3	Malaysia	2004	1.4E+11	1.42	3.8	0.03
3	Malaysia	2005	1.6E+11	2.98	3.8	-2.67
3	Malaysia	2006	1.8E+11	3.61	3.7	2.41
3	Malaysia	2007	2.1E+11	2.03	3.4	1.46
3	Malaysia	2008	2.3E+11	5.44	3.3	-3.90
3	Malaysia	2009	1.8E+11	0.58	3.5	11.78
3	Malaysia	2010	2.2E+11	1.62	3.2	-2.11
3	Malaysia	2011	2.5E+11	3.17	3.1	-0.47
3	Malaysia	2012	2.5E+11	1.66	3.1	3.75
3	Malaysia	2013	2.4E+11	2.11	3.2	4.47
3	Malaysia	2014	2.5E+11	3.14	3.3	2.07
3	Malaysia	2015	2.1E+11	2.10	3.9	3.31
3	Malaysia	2016	2.0E+11	2.09	4.1	2.83
3	Malaysia	2017	2.2E+11	3.87	4.3	0.80
3	Malaysia	2018	2.5E+11	0.88	4.0	4.28
3	Malaysia	2019	2.4E+11	0.66	4.1	4.80
3	Malaysia	2020	2.1E+11	-1.14	4.2	4.75
4	Mexico	2000	1.8E+11	9.49	9.5	5.20
4	Mexico	2001	1.7E+11	6.37	9.3	6.37
4	Mexico	2002	1.7E+11	5.03	9.7	2.57
4	Mexico	2003	1.8E+11	4.55	10.8	2.87
4	Mexico	2004	2.0E+11	4.69	11.3	-0.48
4	Mexico	2005	2.3E+11	3.99	10.9	3.61
4	Mexico	2006	2.7E+11	3.63	10.9	1.06
4	Mexico	2007	2.9E+11	3.97	10.9	1.67
4	Mexico	2008	3.1E+11	5.12	11.1	2.39
4	Mexico	2009	2.4E+11	5.30	13.5	3.00
4	Mexico	2010	3.1E+11	4.16	12.6	0.70
4	Mexico	2011	3.7E+11	3.41	12.4	-0.88
4	Mexico	2012	3.9E+11	4.11	13.2	0.59
4	Mexico	2013	4.0E+11	3.81	12.8	2.70
4	Mexico	2014	4.2E+11	4.02	13.3	-0.85
4	Mexico	2015	4.0E+11	2.72	15.8	0.59
4	Mexico	2016	4.0E+11	2.82	18.7	-0.81
4	Mexico	2017	4.4E+11	6.04	18.9	0.58
4	Mexico	2018	4.8E+11	4.90	19.2	2.95
4	Mexico	2019	4.9E+11	3.64	19.3	4.13
4	Mexico	2020	4.3E+11	3.40	21.5	2.09

5	Peru	2000	8.7E+09	3.76	3.5	25.57
5	Peru	2001	8.6E+09	1.98	3.5	24.41
5	Peru	2002	9.5E+09	0.19	3.5	20.63
5	Peru	2003	1.1E+10	2.26	3.5	18.87
5	Peru	2004	1.5E+10	3.66	3.4	17.31
5	Peru	2005	2.0E+10	1.62	3.3	21.28
5	Peru	2006	2.7E+10	2.00	3.3	15.12
5	Peru	2007	3.2E+10	1.78	3.1	21.05
5	Peru	2008	3.6E+10	5.79	2.9	22.32
5	Peru	2009	3.2E+10	2.94	3.0	18.59
5	Peru	2010	4.1E+10	1.53	2.8	12.55
5	Peru	2011	5.2E+10	3.37	2.8	11.18
5	Peru	2012	5.3E+10	3.61	2.6	17.82
5	Peru	2013	5.0E+10	2.77	2.7	16.90
5	Peru	2014	4.5E+10	3.41	2.8	12.99
5	Peru	2015	4.0E+10	3.40	3.2	13.06
5	Peru	2016	4.3E+10	3.56	3.4	12.99
5	Peru	2017	5.2E+10	2.99	3.3	12.71
5	Peru	2018	5.6E+10	1.51	3.3	11.99
5	Peru	2019	5.5E+10	2.25	3.3	12.28
5	Peru	2020	4.6E+10	2.00	3.5	8.68
6	Thailand	2000	8.2E+10	1.59	40.1	6.42
6	Thailand	2001	7.6E+10	1.63	44.4	5.25
6	Thailand	2002	8.1E+10	0.70	43.0	5.32
6	Thailand	2003	9.4E+10	1.80	41.5	2.23
6	Thailand	2004	1.1E+11	2.76	40.2	0.95
6	Thailand	2005	1.3E+11	4.54	40.2	-0.35
6	Thailand	2006	1.5E+11	4.64	37.9	1.11
6	Thailand	2007	1.8E+11	2.24	34.5	3.49
6	Thailand	2008	2.1E+11	5.47	33.3	0.65
6	Thailand	2009	1.8E+11	-0.85	34.3	4.57
6	Thailand	2010	2.3E+11	3.25	31.7	0.24
6	Thailand	2011	2.6E+11	3.81	30.5	1.28
6	Thailand	2012	2.7E+11	3.01	31.1	3.22
6	Thailand	2013	2.8E+11	2.18	30.7	3.22
6	Thailand	2014	2.8E+11	1.90	32.5	3.46
6	Thailand	2015	2.7E+11	-0.90	34.2	3.98
6	Thailand	2016	2.8E+11	0.19	35.3	1.79
6	Thailand	2017	3.0E+11	0.67	33.9	2.47
6	Thailand	2018	3.3E+11	1.06	32.3	2.68
6	Thailand	2019	3.2E+11	0.71	31.0	3.04
6	Thailand	2020	2.6E+11	-0.85	31.3	4.63

7	Turkiye	2000	5.5E+10	54.92	0.6	74.70
7	Turkiye	2001	5.5E+10	54.40	1.2	50.49
7	Turkiye	2002	6.0E+10	44.96	1.5	37.68
7	Turkiye	2003	7.2E+10	21.60	1.5	24.26
7	Turkiye	2004	9.7E+10	8.60	1.4	20.40
7	Turkiye	2005	1.1E+11	8.18	1.3	21.65
7	Turkiye	2006	1.2E+11	9.60	1.4	22.56
7	Turkiye	2007	1.5E+11	8.76	1.3	22.91
7	Turkiye	2008	1.8E+11	10.44	1.3	17.65
7	Turkiye	2009	1.5E+11	6.25	1.5	15.27
7	Turkiye	2010	1.6E+11	8.57	1.5	14.11
7	Turkiye	2011	1.9E+11	6.47	1.7	17.19
7	Turkiye	2012	2.1E+11	8.89	1.8	15.30
7	Turkiye	2013	2.3E+11	7.49	1.9	16.94
7	Turkiye	2014	2.4E+11	8.85	2.2	14.92
7	Turkiye	2015	2.1E+11	7.67	2.7	14.61
7	Turkiye	2016	2.0E+11	7.78	3.0	15.29
7	Turkiye	2017	2.2E+11	11.14	3.6	23.28
7	Turkiye	2018	2.4E+11	16.33	4.8	25.41
7	Turkiye	2019	2.5E+11	15.18	5.7	13.36
7	Turkiye	2020	2.1E+11	12.28	7.0	20.70

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