Journal of Modern Accounting and Auditing, November 2020, Vol. 16, No.11, 484-501
doi: 10.17265/1548-6583/2020.11.002

The Impact of International Trade on Economic Growth

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This paper investigates the impact of international trade on the economic growth of Saudi Arabia for the period 1980-2018. The investigation was conducted through Dickey-Fuller (1979) and Phillips-Perron (1988) tests of integration techniques were used in this study to test the log-values of the underlying times series for a unit root and Engle-Granger and Johansen's (1988) tests for cointegration to test the long-run relationship between real GDP, real exports, and real imports. The variables selected for the study are gross domestic product, real exports, and real imports which were collected mainly from SMSA (Saudi Arabian Monetary Agency) except the consumer prices was collected from World Development Indicators. The results showed that the economic variables under study were included in their constant values at the root of the unit. In order to ensure a balanced relationship between economic growth and exports, imports, and consumer price, in the long run, we used the Granger Engel method, which reveals a common correlation between the variables. Stability of the regression coefficients from the regression of the joint integration result showed that there is a long-term equilibrium relationship between the variables. Tests of joint integration confirmed that GDP growth is affected by long-term exports. And the causal test results indicate that the GDP and import variables are not linked to the short-run economy, which means there is no causal relationship between imports and economic growth in Saudi Arabia. It is recommended that The Saudi economy must expand its scope in international markets by promoting the growth of other export sectors by liberalizing the services and manufacturing sectors and they must shift the dependence on oil revenues to non-oil revenues into intensive efforts to diversify its export-oriented policies and seek alternative commodities (other than oil and related products). Also, an industrial production base should be established to meet the needs of the local economy and then export.

Keywords: international trade, economic growth, cointegration

Introduction

International trade includes the process of buying goods and services from another country at a lower price, then selling them again to another country at a price higher than the purchase price, which benefits both the buyer and the seller, where people who have money can obtain goods and services that are not available in their countries and obtaining it from other countries, which leads to increased consumer satisfaction, as developed countries benefit from global trade, by providing opportunities to accelerate the pace of economic development, and developed countries can send their scientists to other countries to gain the skills and knowledge related to the needs of its economy. No country in the world can be economically independent

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without a decrease in its economic growth, and this is not limited to developing countries only, but also includes developed countries. For example, developed countries buy raw materials from poor countries for industries, and if the country produces goods to meet its needs only, this will impede the economic progress of the country itself, so that the production of goods and services will be limited, and thus the inability to improve the standard of living of the population around the world. Economic growth is the high level of production capacity in a country, and growth is measured by comparing the gross national product during the current year with the gross national product in the previous year, and there are a set of key factors for increasing economic growth, the most important of it which are technological advances, capital increase. So the increases in productivity lead to higher profitability of companies, and an increase in share prices, which contributes to providing adequate capital for investment, and attracting more employees to employ them, as a result of the increase in the number of job opportunities. Economic growth is an important indicator in the economic sector. It is used to measure the total added value to all production units operating within all branches of production in a specific economic sector, such as industry and agriculture. In developing countries that depend on exports for their economies, economic growth is largely dependent on the growth of exports, such as Asian countries: India, Indonesia, Korea, Pakistan, Philippines, Sri Lanka, and Thailand. As Ekanayake (1999) said in his study to analyze the causal relationship between export growth and economic growth in eight Asian developing countries using annual data from 1960 to 1997, export growth contributes positively to economic growth.

One of the most important economic events contributed to the Kingdom of Saudi Arabia's accession to the World Trade Organization on the date of the signing of a bilateral agreement with the United States of America on the date of the Kingdom of Saudi Arabia.

Saudi Arabia's free market economy has undergone remarkable changes in a relatively short period of time. It has evolved from a basic agricultural society into a regional and global economic power with a modern infrastructure.

Petroleum is an integral part of the Saudi economy; Saudi Arabia is the world's largest producer and exporter of oil. In recent decades the Kingdom has increasingly diversified its economy, and today produces and exports a variety of industrial goods all over the globe.

The government has an essential role in industrial and economic development. The Ministry of Economy and Planning formulates economic and social development plans that set long-term economic goals. Additional sectors of the economy are overseen by individual ministries, such as agriculture, energy, transportation, communications, and finance. The private sector is playing an increasingly larger role in the Saudi economy—it now accounts for 48 percent of the gross domestic product (GDP). The sector is expected to continue growing, especially as Saudi Arabia opens its doors further to foreign investment. The Kingdom's trade with the countries of the world has evolved during the years 2004-2013. There was a surplus in the balance. The commercial activity of the Kingdom during that period ranged between 294,832 million riyals in 2004 to 874,171 million SAR in 2011 as the highest value during this period, while in 2013, the surplus amounted to 778,941 million riyals. During that period, the highest value of exports amounted to 1,456,502 million riyals in 2012, and it was less its value which is 472,491 million riyals in 2004, while in 2013, it amounted to 1,409,523 million riyals. Among the most important countries exported to the Kingdom in 2013 are: the United States of America, China, Japan, South Korea, India, Taiwan, Singapore, United Arab Emirates,

Bahrain, Italy, on straight. The total value of exports to these countries represents 73% of the total exports. The most important national commodities exported for the year 2013 AD were: crude oil oils and products, plastics and articles thereof such as polypropylene and polyethylene, organic chemical products, such as: styrene and ethylene glycol, inorganic chemical products such as ammonia, various fertilizers, aluminum and articles thereof. While the highest value of imports amounted to about 630,582 million riyals in 2013, the lowest value was 177,659 million riyals in 2004, during that period. Among the most important countries from which the Kingdom imported in 2013 are: the United States of America, China, Germany, South Korea, Japan, the United Arab Emirates, India, Italy, Switzerland, France, respectively. The total value of imports from these countries represents 62% of total imports. The most important imported goods for 2013 were passenger transport cars, iron and steel of all kinds, and telephones mobile and handheld devices, gold bars, human medicines, freight cars, barley, faucets and valves. All kinds, auto parts, all kinds of tires, floating or submersible drilling rigs, frozen chicken, parts Airplane spare parts, rice.

Saudi Arabia's foreign trade totals the US $78 billion. It is the world's 25th exporter/importer. Export markets have expanded tremendously following bilateral trade agreements with numerous countries in the region. Saudi Arabia benefits from international and regional trade financing and export guarantee programs offered by the Islamic Development Bank (IDB), the Arab Monetary Fund's Trade Financing Program for financing trade and the Arab Investment Guarantee Corporation's program for ensuring exports and investments. USA, Japan, China, South Korea, Germany, France, Britain, Italy, Singapore, India, Holland, UAE, and Switzerland are amongst Saudi Arabia's leading foreign trade partners.

Saudi Arabia's non-oil exports increased by 4.3 percent to reach 7 billion in 2001 from $6.6 billion in 2000. The Kingdom's total imports were $30.3 billion in 2000, an increase of 8 percent from $28 billion in the previous year. The government has reduced tariffs from 12% to 5%, and efforts are on to accelerate GCC tariff harmonization, which will be effective in 2003. The new Foreign Investment Law allows foreigners to invest in most sectors of the economy. However, there are some business activities that are not allowed by foreigners for a variety of reasons, and they specify in a banned list. The law has abolished the sponsor system and enabled foreign investors to own real estate for company activities and sponsor their foreign employees.

The new Real Estate Law allows foreigners to own real estate except in the two Holy cities of Makkah and Medina. The Kingdom is drastically revising its business-related laws to increase transparency and strengthen the country's global competitiveness. The laws currently under revision include the Capital Markets Law, the Companies Law, the Agency Law, the Insurance Law, the Mining Law, and the Labor Law. Several laws are currently under revision with the aim of pushing forward the process of economic liberalization. In May 2001 the government also issued guidelines for transparency of economic and fiscal data.

Trade policy in the Kingdom of Saudi Arabia is characterized by flexibility, justice, and deepening strategic partnerships with various relevant parties locally and internationally in order to strengthen the bonds of trust between the merchant and the consumer and contribute to maximizing the role of the commercial sector in supporting and sustaining the national economy, and the important Main Pillars, Prosperous Trade in:

1. Enhance and maximize the customers' trust,
2. Ensure the sustainability of the strategic stock of basic commodities,
3. Promote the retail sector and enhance sound business practices.

And firm investment seeks to Improve and promote the business environment.

Strengthen and stimulate E-Commerce in the Kingdom, and institutional excellence in improving the efficiency of resource utilization in the Ministry upgrading and promoting the quality of the Ministry's services, provided to the clients, in accordance with the standards of the institutional excellence to enable and apply the highest levels of digital services in the Ministry.

Statement of the Problem

The purpose of this study is to study the impact of international trade on economic growth in the country of Saudi Arabia. With the development of Saudi Arabia, the government seeks to economic growth, which is one of the reasons for economic growth in international trade.

The main aim of the study is to investigate international trade and its influence on economic growth. The following objectives will use to reach the main aim:

- To identify relevant variables that play a role in international trade and also economic growth after the trade has taken place.
- To determine whether international trade and economic growth are correlated in the long run or a short run.
- To determine if international trade affects the economic growth of Saudi Arabia positively or negatively.

Research question. Does the international trade on economic growth correlate?

The Scope of Study

This study focuses on the impact of international trade and economic growth for Saudi Arabia in the period 1980-2019.

Literature Review

Caleb, Mazanai, and Dhoro (2014) study the relationship between trade and economic growth which has continued to dominate the debate in trade and development economics. The focus of this research paper is to investigate if there exists a long-run relationship between various trade and other macroeconomic variables for Zimbabwe for the period 1975 to 2005. The study employs the co-integration approach to establish the existence of a long-run relationship between economic growth and trade variables. The results of the study indicate that trade and economic growth are co-integrated, but the relationship is strengthened by the stability of the macroeconomic policy since negative macroeconomic drivers such as rising inflation can constrain economic growth. Openness to trade is also deemed to play a crucial role, where reduction and elimination of barriers to trade promote growth in trade and ultimately economic growth.

Saivatore (1994) examines and evaluates the relationship between international trade and economic development. After reviewing and evaluating previous theoretical and empirical studies (the United States, Canada, Australia, New Zealand, Argentina, Uruguay, and South Africa), the paper concludes that (1) while international trade does not, in general, operate as an engine of growth today as it did in the 19th century, it is still a very important vehicle for facilitating economic development in most developing countries today, (2) industrialization through import substitution can be important in the early stages of development for large developing countries, and (3) trade protectionism in developed countries seriously hampers economic development in developing countries.

Thomas (2015) studies "How the U.S. Economy Benefits From International Trade & Investment". With more than 95 percent of the world's population and 80 percent of the world's purchasing power outside the

United States, future economic growth and jobs for America increasingly depend on expanding U.S. trade and investment opportunities in the global marketplace. The United States exported an estimated $1.6 trillion in goods and $687.4 billion in services in 2013. Between 2009 and 2013, U.S. goods exports have increased by 50 percent and services exports by 34 percent. In 2013, 60 percent ($1.3 trillion) of the products imported into the United States were inputs and components used by American producers. Lower cost inputs keep U.S. manufacturing competitive in international markets. The United States has increased its exports to FTA partners following the implementation of the FTAs with those countries.

Joseph (2015) examines the effects of international trade and investment on output and tests the null hypothesis of Granger non-causality among trade, investment, and economic growth in Canada. The long-run model is estimated using several single-equation and system estimators to assess the robustness of results across methodologies. The single-equation, OLSEG, GMM, DOLS, NLLS, and FMOLS, estimates of the model provide consistent support for the positive and significant long-run effects of exports and investment on output. The ML system estimates cross-validate the co-integrating relationship and reinforces the positive effects of exports and investment and the negative effects of imports on output. The over-parameterized level-VAR estimates suggest unidirectional Granger-causality from exports, imports, and investment each to output. The results underline the need for the acceleration of exports (and investment) to offset the demand-reducing effects of imports and escalate the altitudes of output and economic growth.

Idris, Yusop, and Habibullah (2016) study trade openness and economic growth. The goal of this particular study is to investigate the relationship between trade openness and economic growth in 87 selected countries which includes both Organizations for Economic Co-operation and Development (OECD) and developing countries for the 1977-2011 periods. We used two measures of trade openness, i.e., the ratio of trade openness (TO) typically spoke by exports plus imports in nominal value divided by GDP (nominal) which is commonly used in the literature. The empirical results reveal a bidirectional causal relationship for both developing and OECD countries. Our finding is consistent with the endogenous theory that increased openness leads to higher growth, which thus prompts expanded openness.

Mercan, Gocer, Bulut, and Dam (2013) study the effect of trade openness on economic growth was searched for the most rapidly developing countries (emerging markets; Brazil, Russia, India, China, and Turkey, BRIC-T) via panel data analysis by using the annual data of the period from 1989 to 2010. As a trade openness variable, the rate of external trade (Export + Import) to GDP was used. According to empirical evidence derived from the study made with panel data analysis, it was found that the effect of openness on economic growth was positive and statistically significant in line with theoretical expectations.

Hye and Lau (2015) examine the link between trade openness and economic growth in the case of India. This study employs a new endogenous growth model for theoretical support, auto-regressive distributive lag model, and rolling window regression method in order to determine the long run and short-run association between trade openness and economic growth. Further Granger causality test is used to determine the long run and short-run causal direction. The results reveal that human capital and physical capital are positively related to economic growth in the long run. On the other hand, trade openness index negatively impacts economic growth in the long run. In the short run trade openness index is positively related to economic growth. The result of the Granger causality test confirms the validity of trade openness-led growth and human capital-led growth hypothesis in the short run and long run.

Awokuse (2008) studies trade openness and economic growth: Is growth export-led or import-led? This article re-examines the relationship between trade and economic growth in Argentina, Colombia, and Peru with an emphasis on both the role of exports and imports. Granger causality tests and impulse response functions were used to examine whether growth in trade stimulates economic growth (or vice versa). The results suggest that the singular focus of past studies on exports as the engine of growth may be misleading. Although there is some empirical evidence supporting export-led growth, the empirical support for the import-led growth hypothesis is relatively stronger. In some cases, there is also evidence for reverse causality from gross domestic product growth to exports and imports.

Soukhakian (2007) empirically investigates the causal relationship between financial development, trade openness, and economic growth in Japan covering the period 1960-2003. Results suggest that a long-run equilibrium relationship exists between financial development, trade and economic growth in Japan except between domestic credit (the second measure of financial development), trade and growth. The results of Granger causality tests suggest that financial development as proxied by broad money gives causation to economic growth that supports the supply-leading growth hypothesis for the Japanese economy and supports the growth-driven trade (GDT) hypothesis, which claims that economic growth causes "more efficient imports and exports" for Japan.

Wizarat, Hye, and Lau (2016) study the economic growth model to determine the long-run relationship between trade openness and economic growth in China by using the data 1975-2009. This study employs the rolling window regression method in order to examine the stability of coefficients throughout the sample span. The autoregressive distributed lag (ARDL) co-integration technique and rolling regression method are used. The empirical findings indicate that trade openness (i.e., both individual trade indicator and composite trade openness index) is positively related to economic growth in the long run and short run. Our results indicate that trade openness as measured by individual trade indicator and composite trade openness index is positively related to economic growth in the long run and short run. However, results from the rolling window suggest that trade openness is negatively linked to economic growth only for a number of years.

Rehman, Ali, and Nasir (2015) investigate the relationship between financial development, trade openness, and economic growth in the Saudi Arabian economy from 1971 to 2012. The paper employed unit root tests, the co-integration test, the Granger causality test and the Vector Error Correction Model (VECM). The results from Johansen and Juselius co-integration test underpin for the existence of a long-run relationship among the purported variables. Granger causality test exhibits unidirectional causality running from the trade openness to the economic growth in Saudi Arabia. Economic growth also causes financial development. The results manifest that combined causality exists among the variables. The study advocates for the acceleration of financial development in tandem with enhancing the ambit of trade openness for stimulating economic growth in the country.

Makun (2017) attempts to examine the effects of trade openness on economic growth in Malaysia by applying a time-series econometric technique. LSE-Henry's general to specific approach results shows a significant positive effect of trade openness on growth. Human capital and good economic policies tested with an interaction term increase the growth effects of trade openness. The addition of these variables and findings are significant statistically and robust to different specifications. On the basis of the findings, it is concluded that while trade openness enhances growth, decision-makers should also focus on human capital development. In addition, decision-makers should ensure good economic policies to take full benefit of trade openness.

Zeren and Ari (2013) study the relationship between openness and economic growth. This paper applies the most recently developed Granger non-causality test in heterogeneous panels to reinvestigate the causality relationship between trade openness and economic growth for the G7 (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) countries between 1970 and 2011. The empirical results show there is a bidirectional causality relationship. Thus, as is advocated by the theories of endogenous growth, as openness increases, growth increases in the G7 countries and, subsequently, the increase in growth increases openness.

Burange, Ranadive, and Karnik (2013) analyze the causal relationship between trade openness and economic growth for the member countries of BRICS by using the econometric technique of time series analysis. The paper makes an attempt to study the impact of trade openness on their growth in GDP per capita. It captures the structural composition of GDP and openness of trade-in four aspects, i.e., merchandise exports, merchandise imports, service export, and service import. The result of causality suggests that, in the case of Brazil, openness has led to GDP per capita growth. The paper supports the export-led growth hypothesis for China whereas growth-led export for South Africa. Both of these hypotheses are evidenced to be valid for Russia and India.

Yusoff and Nuh (2015) examine whether FDI and international trade have positively contributed to the economic growth of Thailand. In recent years, the Thailand economy has become more open to foreign trade as well as foreign direct investment (FDI). The results of the Granger causality tests indicate that they are indeed important determinants of growth in Thailand. This suggests that policymakers in Thailand should liberalize its economy to encourage foreign trade and FDI inflows to achieve sustained high economic growth.

Methodology and Data Sources

The Data Sources

The data used to study economic growth and international trade of Saudi Arabia for the period 1980-2018. Gross domestic product, real exports, and real imports were collected mainly from SMSA (Saudi Arabian Monetary Agency) expt. Consumer Prices was collected from World Development Indicators in collaboration with the observation of 39 sample sizes. This information is collected to assist in order to be able to draw conclusions on the study..

The Methodology

In order to examine the impact of economic growth and international trade in Saudi Arabia in the long run, Dickey-Fuller and Phillips-Perron tests of integration techniques will be used in this study to test the log-values of the underlying times series for a unit root and Engle-Granger and Johansen's (1988) tests for cointegration to test the long-run relationship between real GDP, real exports, and real imports. In order to carry out effective statistical analysis of the regression results, Tyler (1981), the export-led growth hypothesis (ELGH) postulates that export growth is one of the key determinants of economic growth. This study goes beyond the traditional neoclassical theory of production. Edwards (1998) has hypothesis that open economies grow more rapidly than those that are closed.

Guided by the empirical literature, this study introduces a model to the relationship between international trade and economic growth. Based on the objective, the present study seeks to test the following hypothesis:

H0: International trade causes economic growth.

H1: Rising economic growth attracts international trade.

The log-linear specifications of the variables are employed and the following estimation equation is used as a model:

$LnGDP = \beta 0 + \beta 1\ LnX + \beta 2\ LnM + \beta 3\ LnCPI + \varepsilon$.

GDP: Gross domestic product,

X: Real exports,

M: Real imports,

CPI: Consumer prices,

ε: Random error term,

β: Slope coefficient.

The dependent variable used is the gross domestic product (GDP) which represents economic growth. And the independent variables are exports, imports, and consumer prices. Exports (X) represents the goods and services produced in one country and purchased by residents of another country. Imports (M) represents foreign goods and services bought by citizens, businesses, and the government of another country. The Consumer Price Index (CPI) is a measure that examines the weighted average of prices of a basket of consumer goods and services, such as transportation, food, and medical care.

And the stability of long-term economic growth and international trade in Saudi Arabia is examined by unit root tests. This is extremely important in experimental research to ensure that false regressions are avoided.

Descriptive Statistics

Table 1 shows the descriptive statistics of the variables GDP, exports, imports, and consumer prices for Saudi Arabia for the entire sample and separately for each one.

And we have found that at the 5% level of significance, all variables (GDP, X, M, CPI), do not follow distributive normality.

Table 1

Shows Descriptive Statistics

Descriptivestatistics				
Variables	LnGDP	LnX	LnM	LnCPI
Mean	14.20648	12.73116	12.09467	4.148065
Median	14.12686	12.51260	11.70428	4.152194
Maximum	14.78291	14.19155	13.39244	4.300224
Minimum	13.56477	11.22094	11.16733	3.987301
Std.dev.	0.346829	0.905317	0.743362	0.092196
Skewness	0.057711	0.144700	0.602137	-0.066358
Kurtosis	2.109145	1.732552	1.772744	1.882684
Jarque-bera	1.311286	2.746539	4.804206	2.057265
Prop	0.519108	0.253278	0.090527	0.357495
Sum	554.0525	496.5153	471.6922	2.057265
Sumsq.dev.	4.571026	31.14475	20.99834	0.357495

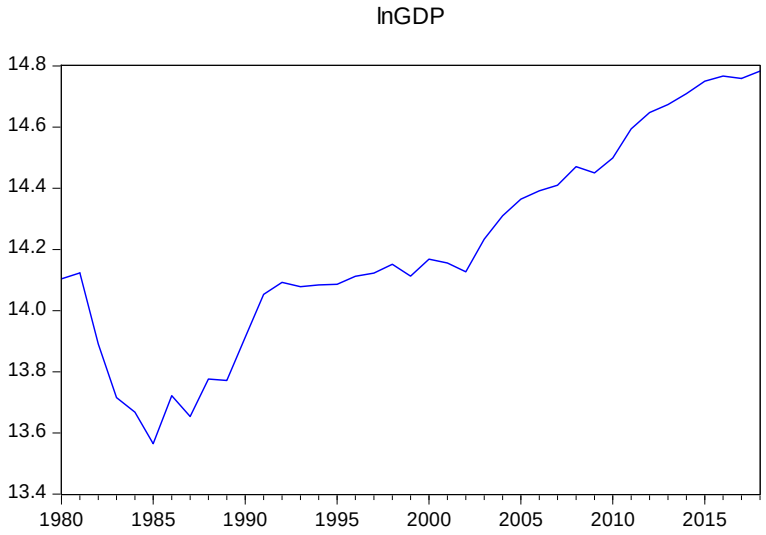

Figure 1. GDP of SA for the period1980-2018.

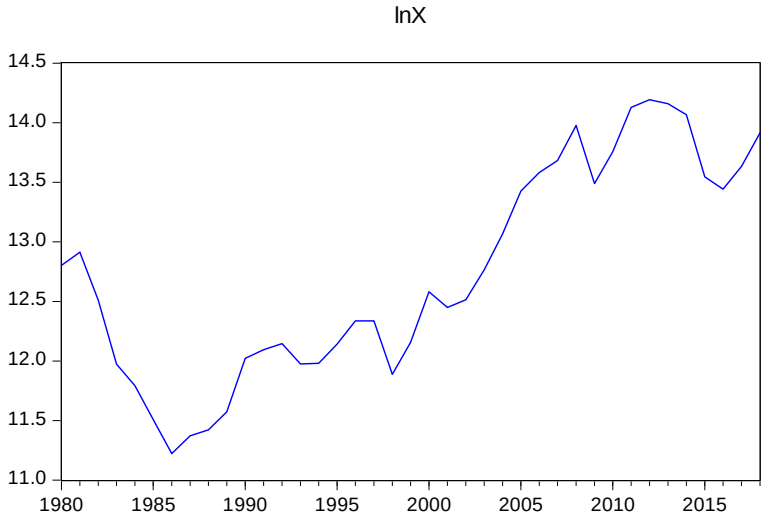

Figure 2. X of SA for the period 1980-2018.

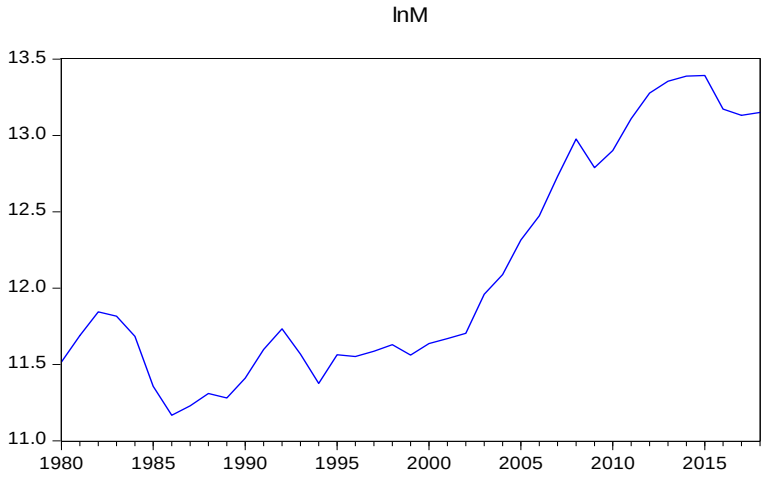

Figure 3. M of SA for the period1980-2018.

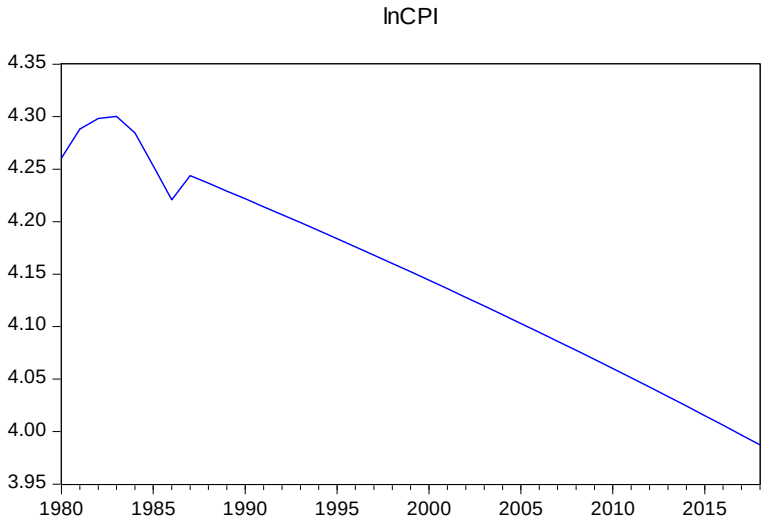

Figure 4. CPI of SA for the period1980-2018.

Data Analysis and Interpretations

Unit Root Tests

Prior to estimating for co-integration and causal relationship between the time series variables, the first and foremost step is to test their stationarity in order to evade any spurious or misleading relationship between them. A series of data is said to be stationarity if its mean and variance are time invariant. Hence, this study applied Dickey-Fuller and Phillips-Perron tests of integration which are the most common tests in the literature to ensure the stationarity of the economic variables.

Table 2

Shows Unit Root Tests Result

Variable	ADF		PP	
	Level	1st difference	Level	1st difference
LnGDP	0.332226 (0.9770)	-4.780872 (0.0004)*	-0.055415 (0.9471)	-4.853211 (0.0003)*
LnX	-0.429659 (0.8938)	-4.471937 (0.0010)*	-0.634439 (0.8509)	-4.508372 (0.0009)*
LnM	-0.429659 (0.8938)	-4.471937 (0.0010)*	-0.256873 (0.9220)	-4.057554 (0.0032)*
LnCPI	-0.158991 (0.9350)	-5.721661 (0.0000)*	1.674386 (0.9994)	-12.11245 (0.0000)*

*Note.** significance at the 5% level, respectively.

The above table shows that GDP, X, M, and CPI are non-stationary at level. So we rejected in the significant level. Therefore, all variables which we have taken for the present study are following the first order of integration I (1). That means all the variables of the study have achieved stationarity after the first difference.

Cointegrating Test

We can use Engle-Granger which is a residual-based unit root test as a method of cointegration.

The result in Table 3 shows that the impact of international trade on economic growth does not hold in Saudi Arabia in the long-run because based on the test of cointegration (Engle-Granger) we fail to reject the null of no cointegration at the 5% significance level.

Table 3

Shows the Result of Cointegrating Test

	GDP
$\beta_\circ$	21.80239 (8.182781)
β_1	0.172769 (2.374700)
β_2	-0.014851 (-0.154759)
β_3	-2.314994 (-4.735271)
R^2	0.939551
EG_τ	-2.609998 (0.6348)
EG_μ	-10.93291 (0.6874)

Johansen Cointegration Method

The study has employed a cointegration test to confirm the existence of a long-run relationship between real GDP, real exports, real imports, and real consumer price. For this purpose, we used Johansen's cointegration procedure to find the long-run relationship between variables. The cointegration test results are presented in Table 4.

Table 4

Shows the Result of Johansen Cointegration Test

	LnGDP
$\beta_\circ$	25.06881
β_1	0.415605
β_2	-0.348129
β_3	-2.926191
MaxTest	
None	66.57348*
Atmost	36.09257*
TraceTest	
None	136.7247*
Atleast	70.15120*

*Note.** significance at the 5% level, respectively.

The above result of the Johansen's cointegration test shows that null hypothesis of trace statistics and maximum eigenvalue statistics value is less than the 5% conventional significance level and accepts null and rejects the alternative hypothesis with concludes that three cointegrating equations exist between the exports, imports, consumer price, and GDP. This shows that there is a long-run relationship between exports, imports, consumer price, and GDP in Saudi Arabia.

Granger Causality Test

In order to examine the causal relationship between exports, imports, and economic growth the study has used Granger causality technique proposed by C. W. J. Granger (1969).

Table 5

Shows the Result of Granger Causality Test

Nullhypothesis	F-statistic	Prob.
LnX does not Granger cause LnGDP.	1.62970	0.2118
LnGDP does not Granger cause LnX.	3.58014	0.0395*
LnM does not Granger cause LnGDP.	0.39395	0.6776
LnGDP does not Granger cause LnM.	2.85754	0.0721
LnCPI does not Granger cause LnGDP.	18.6158	4.E-06
LnGDP does not Granger cause LnCPI.	4.36195	0.0211*
LnM does not Granger cause LnX.	0.93705	0.4023
LnX does not Granger cause LnM.	7.75958	0.0018*
LnCPI does not Granger cause LnX.	8.37582	0.0012*
LnX does not Granger cause LnCPI.	0.17810	0.8377
LnCPI does not Granger cause LnM.	5.15774	0.0114*
LnM does not Granger cause LnCPI.	1.23917	0.3031

*Note.** significance at the 5% level, respectively.

After testing the common integration (long-term relationship) between the variables, the results of the Granger causal test are shown in Table 5. The guide in this section provides support for the causal relationship between exports and imports, consumer price, and economic growth in the short run. There is strong evidence indicating that the direction of causation extends from imports as well as exports and consumer prices to economic growth and from economic prosperity to exports, imports, and consumer prices in the case of Saudi Arabia. These results show that we accept the null hypothesis in some cases. Therefore, we found that there is a unidirectional causality between exports and, consumer price, and economic growth in Saudi Arabia. And there is no causal relationship between imports and economic growth in Saudi Arabia.

Error Correction Model

An error correction model (ECM) belongs to a category of multiple time series models most commonly used for data where the underlying variables have a long-run stochastic trend, also known as cointegration. ECMs are a theoretically-driven approach useful for estimating both short-term and long-term effects of one-time series on another.

Table 6

Shows the Result of Error Correction Model

Variable	Coefficient	Std.error	T-statistic	Prob.
C	-0.007325	0.014368	-0.509808	0.6136
D(LnX)	0.115692	0.042465	2.724389	0.0102*
D(LnM)	0.100764	0.089071	1.131283	0.2661
D(LnCPI)	-2.399017	1.206644	-1.988173	0.0551
U(-1)	-0.259914	0.129971	-1.999789	0.0538

*Note.** significance at the 5% level, respectively.

The above table shows that there is a long-run equilibrium relationship between economic growth and imports, exports, and consumer price in Saudi Arabia because the error correction has a term which is a negative coefficient and significant at 5%. The R squared 0.482 is smaller than Durbin-Watson stat 1.763 meaning that our error correction model is not a nonsense model, so we can accept the model.

Conclusion

In this study, we aimed at exploring whether export, import, and consumer have an impact on the economic growth of Saudi Arabia, during 39 years period spanning over 1980-2018. Our data series are reasonably long and cover the pre- and post-liberalization periods alike, making it possible to capture the effects of measures to promote exports, import, and consumer output growth. We studied Granger causality between the logarithms of exports, imports, consumer price, and GDP. In order to re-enforce the results, we applied two complementary strategies. The first, indirect, approach assumes that the variables are stationary or can be made stationary by differencing.

It makes use of pre-testing for unit roots and cointegration and, depending on the outcomes, testing for causality. Based on these strategies, we are of the opinion of exports, imports, and consumer price. We can state that GDP, export, and consumer price have a short-run relationship in the Saudi economy amid the investigation time frame, which confirms the results reached previously by the method of joint integration of Angel Granger. This result differs from the general trend of the results obtained in economic literature.

Results

1. In order to estimate the relationship between exports and economic growth, a test was used to examine the stability of the time series. The results showed that the economic variables under study were included in their constant values at the root of the unit. In order to ensure a balanced relationship between economic growth and exports, imports, and consumer price, in the long run, we used the Granger Engel method, which reveals a common correlation between the variables.

2. Stability of the regression coefficients from the regression of joint integration compared to the values of the values scheduled with statistical test ADF and Phillips-Perron for all models, meaning that there is a long-term equilibrium relationship between the variables.

3. Tests of joint integration confirmed that GDP growth is affected by long-term exports.

4. The results of the causal test indicate that the GDP and export, consumer price variables are associated in the short run with the economy, which means that there is unidirectional causality between exports and, consumer price and economic growth, which is in line with the results achieved in the economic reality.

5. The causal test results indicate that the GDP and import variables are not linked to the short-run economy, which means there is no causal relationship between imports and economic growth in Saudi Arabia.

Describe Policy Implications and Recommendations

1. The Saudi economy must shift the dependence on oil revenues to non-oil revenues into intensive efforts to diversify its export-oriented policies and seek alternative commodities (other than oil and related products).

2. The Saudi economy must expand its scope in international markets by promoting the growth of other export sectors by liberalizing the services and manufacturing sectors.

3. Export policies must be implemented, leading ultimately to greater economic stability, job creation, and participation in meeting the needs of the growing developing people.

4. An industrial production base should be established to meet the needs of the local economy and then export.

Direction of Future Research

Future efforts should be directed to examine the impact of the industry, technology, and oil products sector on economic growth as the expansion of the industrial, technological, and oil products sectors are expected to increase exports and reduce imports.

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Appendix A

Engle-Granger

Cointegration test—Engle-Granger				
Date:04/11/20Time:00:42				
Equation:Untitled				
Specification: LnGDP, LnX, LnM, LnCPI, C				
Cointegrating equation deterministics: C				
Null hypothesis: Series are not cointegrated				
Automatic lag specification (lag=0 based on Schwarz Info Criterion, maxlag =8)				
		Value	Prob.*	
Engle-Grangertau-statistic		-2.609998	0.6348	
Engle-Grangerz-statistic		-10.93291	0.6874	
*MacKinnon (1996) p-values.				
Intermediateresults:				
Rho-1		-0.287708		
RhoS.E.		0.110233		
Residual variance		0.003364		
Long-run residual variance		0.003364		
Number of lags		0		
Number of observations		38		
Number of stochastic trends**		4		
**Number of stochastic trends in asymptotic distribution.				
Engle-Grangertest equation				
Dependent variable: D(RESID)				
Method: Least Squares				
Date:04/11/20 Time: 00:42				
Sample (adjusted): 1981, 2018				
Included observations: 38 after adjustments				
Variable	Coefficient	Std.error	T-statistic	Prob.
RESID(-1)	-0.287708	0.110233	-2.609998	0.0130
R-squared	0.154507	Meandependentvar		-0.002117
Adjusted R-squared	0.154507	S.D.dependentvar		0.063075
S.E. of regression	0.057998	Akaikeinfocriterion		-2.830863
Sum squared resid	0.124458	Schwarzcriterion		-2.787769
Log likelihood	54.78640	Hannan-Quinncriter		-2.815531
Durbin-Watson stat	1.926046			

Johansen Cointegration Test

Date: 04/11/20 Time: 01:04
Sample (adjusted): 1985, 2018
Included observations: 34 after adjustments
Trend assumption: No deterministic trend (restricted constant)
Series: LnGDP, LnX, LnM, LnCPI
Lags interval(in first differences): 1 to 4

Unrestricted cointegration rank test (trace)				
Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical value	Prob.**
None*	0.858866	136.7247	54.07904	0.0000
At most 1*	0.654079	70.15120	35.19275	0.0000
At most 2*	0.513248	34.05863	20.26184	0.0003
At most 3*	0.245518	9.578628	9.164546	0.0417
Trace test indicates 4cointegrating eqn(s) at the 0.05 level.				
*denotes rejection of the hypothesis at the 0.05 level.				
**MacKinnon-Haug-Michelis (1999) p-values.				
Unrestricted cointegration rank test (maximum eigenvalue)				
Hypothesized		Max-eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Criticalvalue	Prob.**
None*	0.858866	66.57348	28.58808	0.0000
At most 1*	0.654079	36.09257	22.29962	0.0003
At most 2*	0.513248	24.48000	15.89210	0.0018
At most 3*	0.245518	9.578628	9.164546	0.0417
Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level.				
*denotes rejection of the hypothesis at the 0.05 level.				
**MacKinnon-Haug-Michelis (1999) p-values.				
Unrestricted cointegrating coefficients (normalized by b'*S11 *b=I)				
LnGDP	LnX	LnM	LnCPI	C
14.34808	-5.963139	4.994979	41.98521	-359.6893
29.52298	-11.53446	10.12521	90.59435	-774.4361
6.936836	-3.797918	8.426196	46.41035	-342.8681
11.18422	8.041594	-9.334279	35.38914	-292.2822
Unrestricted adjustment coefficients (alpha)				
D(LnGDP)	0.005190	-0.027471	0.011331	-0.008846
D(LnX)	-0.018302	-0.126128	-0.100854	0.017886
D(LnM)	-0.035932	-0.060078	0.002221	0.018321
D(LnCPI)	-0.004172	0.001479	-0.001135	0.000154
1.Cointegrating equation(s)		Log likelihood	285.5135	
Normalized cointegrating coefficients (standard error in parentheses)				
LnGDP	LnX	LnM	LnCPI	C
1.000000	-0.415605	0.348129	2.926191	-25.06881
	(0.12559)	(0.12363)	(0.41330)	(2.14023)
Adjustment coefficients (standard error in parentheses)				
D(LnGDP)	0.074473			
	(0.14462)			
D(LnX)	-0.262592			
	(0.74227)			
D(LnM)	-0.515554			
	(0.29337)			
D(LnCPI)	-0.059866			

	(0.01033)			
2.Cointegrating equation(s)		Log likelihood	303.5598	
Normalized cointegrating coefficients (standard error in parentheses)				
LnGDP	LnX	LnM	LnCPI	C
1.000000	0.000000	0.261898	5.302152	-44.46879
		(0.81753)	(6.60347)	(36.4708)
0.000000	1.000000	-0.207482	5.716868	-46.67884
		(2.03547)	(16.4412)	(90.8042)
Adjustment coefficients (standard error in parentheses)				
D(LnGDP)	-0.736547	0.285909		
	(0.24826)	(0.09820)		
D(LnX)	-3.986269	1.563954		
	(1.36945)	(0.54172)		
D(LnM)	-2.289230	0.907232		
	(0.47084)	(0.18625)		
D(LnCPI)	-0.016210	0.007825		
	(0.02049)	(0.00810)		
3.Cointegrating equation(s)		Log likelihood	315.7998	
Normalized cointegrating coefficients(standard error in parentheses)				
LnGDP	LnX	LnM	LnCPI	C
1.000000	0.000000	0.000000	3.892107	-34.94573
			(2.55302)	(10.8705)
0.000000	1.000000	0.000000	6.833941	-54.22324
			(7.40247)	(31.5189)
0.000000	0.000000	1.000000	5.383946	-36.36169
Adjustment coefficients (standard error in parentheses)				
D(LnGDP)	-0.657949	0.242877	-0.156748	
	(0.23640)	(0.09533)	(0.09927)	
D(LnX)	-4.685876	1.946989	-2.218304	
	(1.13388)	(0.45723)	(0.47613)	
D(LnM)	-2.273824	0.898797	-0.769065	
	(0.48090)	(0.19392)	(0.20193)	
D(LnCPI)	-0.024080	0.012133	-0.015428	
	(0.01879)	(0.00758)	(0.00789)	

Granger Causality Test

Pairwise Granger causality tests
Date: 04/11/20 Time: 02:25
Sample: 1980, 2018
Lags: 2

Null hypothesis	Obs	F-statistic	Prob.
LnX does not Granger cause LnGDP.	37	1.62970	0.2118
LnGDP does not Granger cause LnX.		3.58014	0.0395
LnM does not Granger cause LnGDP.	37	0.39395	0.6776
LnGDP does not Granger cause LnM.		2.85754	0.0721

LnCPI does not Granger cause LnGDP.	37	18.6158	4.E-06
LnGDP does not Granger cause LnCPI.		4.36195	0.0211
LnM does not Granger cause LnX.	37	0.93705	0.4023
LnX does not Granger cause LnM.		7.75958	0.0018
LnCPI does not Granger cause LnX.	37	8.37582	0.0012
LnX does not Granger cause LnCPI.		0.17810	0.8377
LnCPI does not Granger cause LnM.	37	5.15774	0.0114
LnM does not Granger cause LnCPI.		1.23917	0.3031

Error Correction Model

Dependent variable: D(LnGDP)
Method: Least Squares
Date: 04/12/20 Time: 02:57
Sample (adjusted): 1981, 2018
Included observations: 38 after adjustments

Variable	Coefficient	Std.error	T-statistic	Prob.
C	-0.007325	0.014368	-0.509808	0.6136
D(LnX)	0.115692	0.042465	2.724389	0.0102
D(LnM)	0.100764	0.089071	1.131283	0.2661
D(LnCPI)	-2.399017	1.206644	-1.988173	0.0551
U(-1)	-0.259914	0.129971	-1.999789	0.0538
R-squared	0.482735	Mean dependent var		0.017876
Adjusted R-squared	0.420036	S.D. dependent var		0.077602
S. E. of regression	0.059098	Akaike info criterion		-2.697164
Sum squared resid	0.115255	Schwarz criterion		-2.481692
Log likelihood	56.24611	Hannan-Quinn criter.		-2.620500
F-statistic	7.699272	Durbin-Watson stat		1.763196
Prob(F-statistic)	0.000169			