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Analyzing Import Demand Dynamics in Libya: Insights from the ADRL Approach

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Abstract
Understanding the dynamics of import demand is crucial for policymakers in Libya as they navigate the challenges and opportunities of global trade. By employing the Autoregressive Distributed Lag (ADRL) approach to cointegration, this study sheds light on the long-run relationship between import demand, household consumption, exports, investment, and relative prices in Libya. The findings of the study reveal several key insights into Libya's import demand function. Firstly, the results indicate the presence of a long-run relationship among import demand, household consumption, and exports. This suggests that changes in these variables have a lasting impact on import demand, highlighting the interconnectedness of domestic consumption patterns and international trade dynamics. Importantly, the study finds that import demand in Libya exhibits high elasticity with respect to household consumption and exports in the long run. This implies that changes in household consumption expenditure and export levels significantly influence the volume of imports into the country. Understanding these elasticities can help policymakers anticipate the impact of changes in domestic consumption and export patterns on import demand, enabling more effective trade policy formulation and economic planning. Conversely, the study finds that import demand in Libya is relatively inelastic with respect to investment and relative prices in the long run. This suggests that changes in domestic investment levels and relative prices have a less pronounced effect on import demand compared to household consumption and exports. Policymakers should take into account these differences in elasticities when designing policies aimed at promoting domestic investment or managing relative price fluctuations to mitigate their impact on import levels. In the short run, the study reveals that import demand in Libya exhibits an inelastic behavior relative to various factors, including household consumption, domestic investment, exports, and relative prices. This suggests that in the short term, changes in these variables may have a limited impact on import demand, indicating a certain degree of rigidity or inertia in import patterns. Overall, the findings of this study provide valuable insights into the determinants of import demand in Libya, offering policymakers a better understanding of the factors driving import dynamics and the implications for trade policy, economic growth, and domestic consumption patterns. By incorporating these insights into policy formulation and decision-making processes, policymakers can develop more targeted and effective strategies to promote sustainable economic development and enhance the country's integration into the global economy.
Keywords: Import Demand, Household Consumption, Exports, Relative Prices, Autoregressive Distributed Lag (ARDL)
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1. INTRODUCTION

International economics plays a pivotal role in shaping economic development strategies and fostering global cooperation. In today's era of globalization, international trade has become indispensable for nations seeking to capitalize on their comparative advantages and access foreign markets. Traditional trade theories, such as absolute advantage and comparative advantage, provide valuable insights into how countries can benefit from international trade. By specializing in the production of goods and services where they have a comparative advantage, countries can optimize resource allocation, increase efficiency, and enhance overall welfare. This specialization not only fosters economic growth but also helps alleviate income and technological inequalities by promoting the efficient allocation of resources and facilitating technology transfer across borders. However, it is essential to recognize that the benefits of international trade are not evenly distributed among nations. Developing countries, in particular, may face challenges in fully leveraging the opportunities presented by globalization due to structural constraints, limited access to capital and technology, and unequal bargaining power in international trade negotiations. As a result, efforts to promote inclusive and sustainable development require addressing these disparities and ensuring that the gains from trade are equitably shared among all segments of society. Moreover, the dynamics of international trade are constantly evolving, driven by technological advancements, shifts in global supply chains, and changes in consumer preferences. As such, policymakers and economists must continually adapt their

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approaches to trade policy, investment promotion, and development strategies to navigate the complexities of the global economy effectively.

While international trade offers significant opportunities for economic growth and development, it also presents challenges and disparities that must be addressed through targeted policies and international cooperation. By fostering an inclusive and sustainable trading system, nations can harness the benefits of globalization while mitigating its adverse effects, ultimately contributing to shared prosperity and well-being on a global scale.This issue has become a central controversy among nations, dividing trade economists into two main groups: trade pessimists and trade optimists. Trade optimists advocate for free trade, emphasizing its potential to drive economic growth, enhance efficiency, and promote global integration. They argue that free trade allows countries to specialize in producing goods and services where they have a comparative advantage, leading to increased productivity and higher standards of living. This perspective aligns with traditional economic theories such as those proposed by Adam Smith and David Ricardo, which highlight the benefits of specialization and open markets. Conversely, trade pessimists support restricted or even banned trade. They contend that unregulated trade can lead to negative consequences for developing countries, such as exploitation, dependency, and the erosion of local industries. Trade pessimists emphasize the risks of exposing vulnerable economies to the volatility of global markets, where they may face unfair competition from more developed nations with advanced technologies and greater capital resources. According to this view, protectionist measures, such as tariffs and quotas, are necessary to shield domestic industries, promote self-sufficiency, and ensure stable economic development. Kavoussi (1985) encapsulates this debate by illustrating the divergent perspectives of trade optimists and pessimists. While trade optimists focus on the long-term gains from trade liberalization, trade pessimists highlight the potential short-term disruptions and structural challenges that can arise from opening up economies too quickly. This dichotomy reflects broader ideological differences about the role of the state in managing economic development and balancing market forces and government intervention.

In practice, many countries adopt a hybrid approach, implementing selective trade policies that aim to maximize the benefits of international trade while mitigating its risks. For instance, developing nations might pursue strategic protectionism in key industries while gradually liberalizing other sectors. This approach allows them to build domestic capacities, foster innovation, and enhance competitiveness before fully integrating into the global economy. Ultimately, the debate between trade optimists and pessimists underscores the complexity of international trade and its varied impacts on different economies. Policymakers must carefully consider their specific economic contexts, development goals, and external challenges when formulating trade strategies. By striking a balance between openness and protection, countries can harness the advantages of global trade while safeguarding their economic interests and promoting sustainable development. Recently, the concept of globalization has garnered significant support from trade optimists. They argue that free trade enhances economic efficiency and promotes a competitive environment among domestic and foreign firms, which ultimately drives economic growth. This competition can lead to better availability of human capital and technology, a wider variety of goods and services, and lower prices for consumers in the markets of trading countries (Dollar and Kraay, 2004; Gupta and Choudhry, 1997).

From a historical perspective, the process of trade liberalization has seen significant advancements, particularly following the establishment of the World Trade Organization (WTO). The WTO has played a pivotal role in facilitating and promoting trade liberalization among its member countries. Since its inception, it has worked to reduce trade barriers, such as tariffs and quotas, and has aimed to create a more predictable and transparent trading environment. This has not only boosted trade flows but also integrated global economies more closely. The creation of the WTO marked a significant milestone in the global trade landscape, emphasizing the importance of multilateral trade agreements and the rule of law in international trade. The organization's efforts have been instrumental in advancing the principles of free trade, leading to an unprecedented increase in global trade volumes and economic interdependence among nations. This interconnectedness has enabled countries to benefit from their comparative advantages, leading to more efficient resource allocation and increased productivity. Furthermore, trade liberalization has been associated with numerous positive outcomes. For instance, it has facilitated access to a broader range of goods and services, enhancing consumer choice and welfare. It has also encouraged the transfer of technology and knowledge, contributing to innovation and growth in various sectors. Moreover, by fostering a competitive environment, trade liberalization has driven firms to improve their efficiency and productivity, which is crucial for economic development. However, it is also important to acknowledge that the benefits of trade liberalization are not uniformly distributed. While it can lead to overall economic growth, it may also result in challenges for certain industries and workers who face increased competition from foreign firms. This has led to calls for policies that can help mitigate the adverse effects of trade liberalization, such as social safety nets, retraining programs, and measures to support affected industries.

This issue is of significant concern for developing countries like Libya, which are heavily dependent on imports of capital goods as well as consumer goods to meet the growing needs of their industries and households. The reliance on imports creates a substantial trade imbalance, which is a persistent challenge for many developing nations. Addressing this imbalance requires more rational and research-based trade policies (Salvatore, 1983). Libya, like many other developing countries, finds itself in a precarious position due to its dependence on foreign goods. This dependency exacerbates the trade deficit, where the value of imports consistently exceeds that of exports. Such imbalances can lead to a depletion of

foreign reserves, increased debt, and vulnerability to external economic shocks. The need for a well-crafted trade policy that promotes a more balanced trade relationship is thus paramount. One potential strategy to address trade imbalances is to diversify the economy. For Libya, which has historically been heavily reliant on oil exports, diversification into other sectors such as agriculture, manufacturing, and services could help reduce dependency on imports. By developing these sectors, Libya could increase its range of exportable goods, thereby improving its trade balance. Diversification would also make the economy more resilient to fluctuations in oil prices, which have historically been a source of economic instability.

Another critical aspect is enhancing domestic production capabilities. Investing in local industries to produce goods that are currently imported can help reduce the trade deficit. This requires not only capital investment but also improvements in technology, infrastructure, and workforce skills. For instance, establishing manufacturing plants to produce consumer goods locally would not only reduce import dependency but also create jobs and stimulate economic growth.

Furthermore, improving trade policies through comprehensive research is essential. Policymakers need to analyze global market trends, identify competitive advantages, and negotiate trade agreements that favor the country's economic interests. Trade policies should also focus on improving the regulatory environment to attract foreign direct investment (FDI). FDI can bring in capital, technology, and expertise, all of which are crucial for developing a robust domestic industrial base. Strengthening regional trade agreements can also play a pivotal role. By engaging in regional trade blocs, Libya can benefit from reduced tariffs and increased market access for its goods. Regional cooperation can lead to shared resources, technology transfer, and collective bargaining power on the global stage. This strategy can be particularly beneficial for smaller economies that might struggle to compete independently in the global market. Moreover, addressing the structural issues within the economy is vital. This includes tackling corruption, enhancing transparency, and ensuring political stability. An enabling environment that promotes business and trade can attract both domestic and international investors. Effective governance and a stable political climate are essential for the successful implementation of any trade policy. Achieving a balanced trade environment in developing economies like Libya requires a thorough analysis of the trade patterns specific to such economies. This involves not only studying the causes and effects of trade among nations but also understanding the nuanced dynamics of income and price elasticities related to imports and exports. By estimating these elasticities, policymakers can better assess how changes in income levels and prices affect Libya's trade balance (Brester, 1996).

To begin with, the income elasticity of demand for imports measures how the quantity of imports changes in response to changes in national income. If the income elasticity is high, it indicates that as the economy grows and incomes rise, the demand for imports increases significantly. Conversely, if the elasticity is low, the demand for imports is less sensitive to changes in income. Understanding this relationship can help predict how economic growth will impact import levels and, consequently, the trade balance. Similarly, the price elasticity of demand for imports reflects how sensitive the quantity of imports is to changes in their prices. A high price elasticity means that consumers will significantly reduce their import consumption in response to price increases, which could improve the trade balance if domestic alternatives are available. On the other hand, a low price elasticity indicates that import demand is relatively inelastic to price changes, suggesting that even significant price increases will not substantially reduce import levels. For exports, income elasticity measures how foreign demand for a country's exports responds to changes in the trading partners' income levels. If Libya's exports have high income elasticity, an increase in global economic growth would lead to a significant rise in demand for Libyan exports, potentially improving the trade balance. Price elasticity for exports indicates how changes in the prices of Libya's export goods affect the quantity demanded by foreign markets. High price elasticity means that foreign buyers are sensitive to price changes, which can be crucial for maintaining competitive pricing strategies in international markets. By estimating these elasticities, Libya can devise targeted policies to manage its trade balance more effectively. For instance, if the income elasticity of imports is high, policies that promote domestic production and import substitution could be beneficial. These might include providing incentives for local industries to produce goods that are currently imported, thereby reducing dependency on foreign products. Additionally, if the price elasticity of exports is high, maintaining competitive pricing and improving the quality of export goods can help increase demand in international markets. Furthermore, understanding these elasticities can aid in negotiating trade agreements. By knowing which goods have high income and price elasticities, Libya can prioritize sectors that will benefit the most from reduced tariffs and increased market access. This strategic approach can help maximize the benefits of trade agreements and improve the overall trade balance. Additionally, assessing the impact of income and price changes on trade balance allows for better macroeconomic planning. For instance, if rising incomes lead to higher imports, measures can be taken to ensure that export growth keeps pace with import growth, preventing a widening trade deficit. This might involve investing in export-oriented industries, improving infrastructure to facilitate trade, and enhancing the skills of the workforce to meet the demands of global markets.

The estimation of income and price elasticities not only aids in understanding the trade balance but also has significant implications for welfare and employment levels among partner countries, as well as for domestic trade policy choices (Goldstein and Khan, 1985). Income elasticity of demand for imports can reflect changes in consumer welfare. A high income elasticity indicates that as national income rises, consumers are likely to demand more imported goods, suggesting an improvement in consumer welfare due to greater access to a variety of goods. However, this can also lead to increased import dependence, which might affect domestic industries and employment if local products are not competitive enough.

Conversely, low income elasticity implies that import demand is less responsive to income changes, potentially indicating a stronger domestic market presence and stability in local employment. Price elasticity of demand for imports affects both consumer welfare and employment. A high price elasticity means that consumers will significantly reduce their import consumption in response to price increases, which could benefit domestic producers and increase employment in local industries. However, if domestic alternatives are not available or are of lower quality, consumer welfare might decline due to limited choices and higher prices for available goods. For exports, high price elasticity indicates that foreign demand is sensitive to price changes. Competitive pricing can thus enhance export volumes, improve the trade balance, and create employment opportunities in export-oriented industries. In terms of welfare, if a country's exports are highly price elastic, reducing export prices can significantly increase foreign demand, enhancing the country's overall economic welfare by generating more income from abroad. This increased income can be used to improve public services, infrastructure, and social programs, thereby enhancing the standard of living. Conversely, if imports are highly price elastic, policies aimed at making imports more expensive (e.g., through tariffs) can protect domestic industries, boost local employment, and improve domestic economic welfare. Employment levels are directly influenced by these elasticities. High income elasticity for imports might mean that domestic industries need to innovate and improve their competitiveness to retain market share, which can lead to job creation in sectors that successfully adapt. High price elasticity for exports can lead to increased production and employment in export industries if demand responds positively to competitive pricing. However, if domestic industries cannot compete with imported goods, high income elasticity for imports can lead to job losses in those sectors. Domestic trade policy choices are also informed by these elasticities. Policymakers can use this information to design tariffs, subsidies, and other trade regulations that optimize economic outcomes. For instance, if the price elasticity of imports is high, imposing tariffs can effectively reduce import volumes, protect domestic industries, and create jobs. If the income elasticity of exports is high, policies that promote export growth, such as trade agreements and incentives for exporters, can lead to substantial economic benefits. Additionally, understanding these elasticities helps in negotiating trade agreements. Countries can prioritize sectors with high export elasticity for favorable terms, enhancing their competitive advantage. They can also protect industries with high import elasticity to safeguard domestic employment and economic stability.

In a two-country model where trade is used to balance economic activities between the countries, even if both countries have the same income growth rate, the path of the trade balance can change over time due to variations in the income elasticities of imports and exports. This scenario, where unfavorable income elasticities emerge, can pose significant challenges for one of the countries involved (Houthakker and Magee, 1969). Income elasticity of demand for imports measures how sensitive the demand for imports is to changes in income. Similarly, income elasticity of demand for exports indicates how sensitive the demand for a country’s exports is to changes in foreign income (Goldstein and Khan, 1985). If these elasticities are unfavorable, meaning that one country’s imports grow faster relative to its exports as incomes rise, that country can experience a trade deficit, which can lead to several economic issues. For example, consider two countries, A and B, both experiencing the same rate of income growth. If Country A has a higher income elasticity of demand for imports compared to Country B, as both countries' incomes rise, Country A's demand for imports will increase more rapidly than its exports to Country B. Over time, this could lead to a trade imbalance where Country A consistently imports more than it exports. This persistent trade deficit could have several consequences (Brester, 1996). To pay for the increased imports, Country A may need to deplete its foreign reserves, leading to potential financial instability. Additionally, Country A might need to borrow more from international markets to finance its trade deficit, increasing its external debt burden. Persistent trade deficits can also lead to depreciation of Country A's currency as demand for foreign currencies increases to pay for imports. This depreciation can make imports more expensive and potentially lead to inflationary pressures. As Country A's imports outpace its exports, domestic industries may face stiff competition from foreign goods, leading to reduced domestic production and potential job losses, thereby slowing economic growth (Salvatore, 1983).

In contrast, if Country B has a favorable pattern of income elasticities, its exports may grow faster than its imports as income rises, leading to a trade surplus. This surplus can provide several benefits. Country B can accumulate foreign reserves, providing a buffer against economic shocks. A trade surplus can lead to appreciation of Country B's currency, making imports cheaper and potentially lowering inflation. Surplus funds can be invested in infrastructure, education, and other areas to promote long-term economic growth. A trade surplus can contribute to overall economic stability and confidence among investors (Dollor and Kraay, 2004). The dynamic nature of income elasticities and their impact on the trade balance underscores the importance of understanding and managing these elasticities through appropriate economic policies. For instance, Country A could focus on enhancing the competitiveness of its export sectors to better match the growth in imports. This might involve investing in technology, improving product quality, or negotiating better trade terms (Gupta and Choudhry, 1997). The trade flow pattern for Libya can be better understood by developing a statistical framework that includes an adequate set of explanatory variables. This approach allows for a comprehensive analysis of the factors influencing Libya's trade dynamics. It is crucial to identify the most parsimonious set of exogenous variables that effectively explain the trade patterns of the country. In this context, a single-equation model can be employed to elucidate how imports in Libya are influenced by several key factors. These factors include the aggregate level of household consumption, which reflects the domestic demand for goods and services. As household consumption increases, the demand

for imported goods, particularly consumer goods, is likely to rise. Another significant factor is the aggregate level of exports. Exports can provide the foreign exchange necessary to finance imports. A higher level of exports can lead to an increase in import capacity, allowing the country to purchase more goods and services from abroad.

The aggregate level of investment is also a critical determinant of imports. Investment, particularly in infrastructure and industry, often requires the importation of capital goods and technology that are not available domestically. Therefore, an increase in investment typically leads to a corresponding increase in imports of machinery, equipment, and raw materials. Most relative prices in Libya, which encompass the exchange rate and the price levels of domestic versus foreign goods, play a pivotal role in shaping import behavior. When domestic goods are relatively more expensive compared to foreign goods, consumers and businesses are more inclined to import. Conversely, if domestic goods are cheaper, the demand for imports may decline. The exchange rate, which affects the relative cost of imports, is a crucial component of this analysis. An appreciation of the Libyan dinar makes imports cheaper, while a depreciation makes them more expensive. By incorporating these explanatory variables into the model, it is possible to capture the major determinants of import demand in Libya. This approach not only helps in understanding the current trade flow pattern but also provides insights into how changes in these variables might affect future trade dynamics. For instance, policies aimed at boosting exports or investment could have significant implications for import levels. Similarly, managing relative prices through exchange rate policy could be a tool for influencing import behavior.

2. REVIEW OF LITERATURE

Houthakker and Magee (1969) conducted a comprehensive study on aggregate import and export demand functions across various countries, providing a comparative basis for understanding international trade dynamics. Their research also delved into the import and export demand functions specific to the United States, disaggregating the data by trading partners and commodity groups. One of their significant findings was that the import demand in the United States contributed to a persistent trade deficit in the US economy. This imbalance highlights the complexities and challenges associated with maintaining a favorable trade balance, particularly in a large and diverse economy like that of the United States. Their analysis indicated that the demand for imports in the US often outpaced the growth of exports, leading to a deficit. This issue was compounded by the high elasticity of demand for imports relative to changes in income and prices, meaning that even small increases in income or decreases in the relative price of foreign goods could result in substantial increases in imports. Additionally, the study revealed that different commodity groups and trading partners exhibited varying degrees of sensitivity to these factors, suggesting that targeted policy measures could be necessary to address specific segments of the trade deficit.

Mohammad and Tang (2000) utilized the Johansen co-integration approach to analyze aggregate import behavior in Malaysia. Their study aimed to understand the long-term relationship between import demand and various expenditure components. The findings revealed several key insights into Malaysia's import dynamics. Firstly, the study found no long-term association between import demand and expenditure components, indicating that imports were influenced by a combination of factors rather than solely by expenditure patterns. This suggests that Malaysia's import demand is influenced by a complex interplay of economic variables beyond just consumer and investment spending. Moreover, the research highlighted differences in the elasticity of import demand with respect to different expenditure components. Import demand was found to be less elastic in response to consumption expenditures compared to investment expenditures. This implies that changes in consumer spending have a relatively smaller impact on import demand compared to changes in investment levels. Additionally, the study found that export expenditure had the lowest coefficient, indicating a weaker influence on import demand compared to other expenditure components. Furthermore, the relative prices of imports were found to have a negative and less elastic association with import demand in Malaysia. This suggests that changes in the prices of imported goods have a limited effect on import demand, indicating that other factors may play a more significant role in driving import behavior.

Mohammad and Tang's analysis provides valuable insights into the determinants of import demand in Malaysia, shedding light on the complex interactions between expenditure components and relative prices in shaping the country's import dynamics. These findings can inform policymakers and stakeholders in Malaysia's trade and economic sectors, aiding in the formulation of effective policies to manage import behavior and promote economic stability. Min et al. (2002) employed the Johansen co-integration method to assess the income elasticity of import demand in South Korea. Their study delved into the relationships between import demand and various economic factors, shedding light on the determinants of import behavior in the country. The findings of the study revealed several important insights into South Korea's import dynamics. Firstly, relative prices were found to have a negative effect on import demand, indicating that changes in the prices of imported goods exerted a dampening effect on import levels. This suggests that South Korea's import behavior is sensitive to changes in the relative prices of imported goods, with higher prices leading to reduced import demand. Additionally, the study identified a positive relationship between import demand and consumption expenditure. This implies that increases in consumer spending were associated with higher levels of import demand in South Korea, reflecting the country's reliance on imported goods to meet domestic consumption needs. In contrast, the relationship between import demand and investment expenditure was found to be insignificant and negative. This suggests that changes in investment levels had a limited impact

on import demand in South Korea, indicating that investment spending may not be a significant driver of import behavior in the country. Furthermore, the study revealed an inelastic and positive relationship between import demand and export expenditure. This implies that increases in export expenditure were associated with higher levels of import demand in South Korea, indicating a complementary relationship between imports and exports in the country's trade dynamics. Min et al.'s analysis provides valuable insights into the factors driving import demand in South Korea, highlighting the importance of relative prices, consumption expenditure, investment expenditure, and export expenditure in shaping the country's import behavior. These findings can inform policymakers and stakeholders in South Korea's trade and economic sectors, aiding in the development of effective strategies to manage import dynamics and promote economic growth.

Ho (2004) delved into the intricacies of import demand by examining both disaggregated and aggregated import behavior in relation to aggregate expenditure. Employing the JJ-Maximum Likelihood method for co-integration and error correction, the study provided insights into the determinants of import demand elasticity and its relationships with various economic factors.

The findings of the study revealed several key relationships between import demand and aggregate expenditure components. Importantly, the elasticities of import demand were found to be positive and significant in the context of exports and investment expenditure. This suggests that increases in export levels and investment spending were associated with higher levels of import demand, highlighting the interconnectedness of these economic variables in shaping import behavior. Furthermore, the study identified a negative and statistically significant relationship between import demand and relative prices. This indicates that changes in the prices of imported goods exerted a dampening effect on import levels, with higher prices leading to reduced import demand. This finding underscores the importance of price dynamics in influencing import behavior and suggests that price changes can have significant implications for a country's import patterns. Ho's investigation provided valuable insights into the determinants of import demand elasticity and its relationships with key economic factors such as exports, investment expenditure, and relative prices. By shedding light on these relationships, the study contributes to a deeper understanding of import dynamics and informs policymakers and stakeholders in their efforts to manage import behavior and promote economic stability. Narayan and Narayan (2005) conducted an evaluation of the disaggregated import demand function for Fiji, aiming to discern the long-run elasticities associated with various economic factors such as investment expenditures, relative prices, and export expenditures in relation to total consumption. Employing a bound testing approach, the study sought to uncover the long-run associations between these economic variables. The findings of the study indicated the presence of long-run elasticities in import demand concerning investment expenditures, relative prices, and export expenditures relative to total consumption. This suggests that changes in these economic factors have a lasting impact on import demand in Fiji, highlighting the interconnectedness of these variables in shaping import behavior over the long term. Moreover, the bound testing approach revealed statistically significant associations between import demand and the explanatory variables, indicating the presence of long-run relationships between these economic factors. Importantly, the study found that import demand exhibited statistically significant inelasticity relative to the explanatory variables both in the short run and the long run. These findings underscore the importance of investment expenditures, relative prices, and export expenditures in driving import demand in Fiji and suggest that policymakers need to consider these factors when formulating import-related policies. Additionally, the observed inelasticity of import demand highlights the need for careful management of import-related policies to ensure economic stability and sustainable growth in Fiji.

Santos-Paulino and Thirlwall (2004) delved into the impact of trade liberalization on exports, balance of trade, and imports across a dataset comprising 22 developing countries. Employing the Generalized Method of Moments (GMM) technique for panel data analysis, they sought to assess the effect of trade liberalization on various aspects of trade. Their analysis revealed that the influence of trade liberalization on import growth outweighed its impact on export growth in developing countries. Specifically, they found that trade liberalization policies had a relatively greater effect on stimulating import growth compared to export growth. This observation underscores the asymmetrical impact of trade liberalization on different components of trade within developing economies. Furthermore, the study highlighted the implications of trade liberalization for income and price elasticities of import demand and exports. It was found that income elasticity relative to import demand and exports increased equally as a result of trade liberalization. However, the relative share of price elasticity for import demand was higher compared to export prices, indicating that import demand was more responsive to changes in prices than exports. As a consequence of these dynamics, the balance of trade was found to deteriorate following the adoption of trade liberalization policies. This suggests that while trade liberalization may lead to increased trade activity and economic growth, it can also exacerbate trade imbalances and pose challenges for maintaining a favorable balance of trade in developing countries.

Chani and Chaudhary (2010) conducted a study to analyze the impact of final expenditure on aggregate import demand in Pakistan. Employing the Autoregressive Distributed Lag (ARDL) co-integration technique, they investigated the long-run relationship between import demand and various factors such as import prices, final expenditure components including investment, government consumption, and exports. Their findings revealed a long-run association between import demand and Gross Domestic Product (GDP) in Pakistan. This indicates that changes in GDP have a significant impact on import demand over the long term. Additionally, the study observed that import demand was negatively affected by relative prices

in Pakistan, suggesting that higher import prices tended to dampen import demand in the country. The study underscores the importance of considering final expenditure components and relative prices in understanding import demand dynamics in Pakistan. By examining these factors, policymakers can gain insights into the drivers of import demand and formulate strategies to manage trade dynamics effectively.

3. THEORETICAL MODEL

The objective of economic theory is the construction of models that may explain economic behavior of individual units, a country or on the world level. The appropriation of the model in international trade depends on, the kinds of commodities which are traded, the main use of the commodities and the main purpose of the modeling and available data for the research purpose (Chani and Chaudhary, 2010). The theoretical models of international trade consist upon two types and general modeling are available in economic literature. The first is the perfect substitute's models and the second one is imperfect substitution models. The first one is criticized on many grounds and most commonly use model is imperfect substitution model (Kreinen and Officer 1978, Goldstein and Khan 1985). The relative price (prices of imports associated to the domestic substitutes prices), the final consumption of the economy, exports of the country, investment in the country are taken as explanatory variables and the import demand is taken as dependent variable. Following Houthakker and Magee (1969), Kreinin (1973), Goldstein and Khan (1975), Sarmad (1985) and Chani and Chaudhary, (2010), the model import demand function for Libya becomes as:

$$LM = \alpha_0 + \alpha_1 LX + \alpha_2 LFC + \alpha_3 LRP + \alpha_4 LI + \alpha_5 t + u_t$$

where, LM is natural log of aggregate import demand, LX is natural log of aggregate exports, LFC is natural log the final consumption of household, LRP is natural log of relative prices, LI is natural log of aggregate investment, *t* is time trend and μ is white noised error term.

4. RESULTS AND DISCUSSION

The Phillips-Perron (PP) unit root test was conducted to evaluate the stationarity of the variables. Table 1 presents the test statistics and associated probability values for each variable. For the variable LFC, the test yielded a test statistic of 1.8490 with a probability value of 0.9996 under the null hypothesis of a unit root, while the test statistic was -4.4593 with a probability value of 0.0015 under the hypothesis of stationarity. Similarly, for the variable LI, the test statistic was -0.4371 with a probability value of 0.8897 under the null hypothesis of a unit root, and -4.8167 with a probability value of 0.0006 under the hypothesis of stationarity. The variable LM exhibited a test statistic of 0.2710 with a probability value of 0.9725 for the null hypothesis of a unit root, and -5.0918 with a probability value of 0.0003 for the hypothesis of stationarity. Regarding the variable LRP, the test statistic was -1.2149 with a probability value of 0.6541 under the null hypothesis of a unit root, while it was -4.2017 with a probability value of 0.0029 under the hypothesis of stationarity. Lastly, for the variable LX, the test yielded a test statistic of -0.3157 with a probability value of 0.9108 for the null hypothesis of a unit root, and -4.2529 with a probability value of 0.0025 for the hypothesis of stationarity. Overall, variables LI, LM, LRP, and LX rejected the null hypothesis of a unit root at the 1% significance level, indicating stationarity. Conversely, variable LFC did not reject the null hypothesis, suggesting non-stationarity.

Table 1: PP Unit Root Test Analysis

Variables	T-Statistic	Prob. value	T-Statistic	Prob. value
LFC	1.8490	0.9996	-4.4593	0.0015
LI	-0.4371	0.8897	-4.8167	0.0006
LM	0.2710	0.9725	-5.0918	0.0003
LRP	-1.2149	0.6541	-4.2017	0.0029
LX	-0.3157	0.9108	-4.2529	0.0025

Table 2 offers insights into the selection of the lag length for the VAR model, crucial for accurately capturing the dynamics among the variables under consideration. The lag length directly impacts the model's ability to capture dependencies and forecast future values effectively. For a lag order of 0, the log likelihood stands at 101.9714. However, as no sequential modified LR test statistic (LR) is available for this lag order, other criteria such as the Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC), and Hannan-Quinn Information Criterion (HQ) serve as pivotal indicators. These metrics collectively suggest that a higher lag order might be necessary to adequately capture the relationships among the variables. Upon moving to a lag order of 1, a substantial increase in the log likelihood to 278.9084 is observed. Additionally, the sequential modified LR test statistic (LR) registers at 280.6587, signifying a significant preference for a lag order of 1 according to this criterion. Moreover, the FPE dramatically reduces to 2.49e-14, indicating improved predictive performance. The AIC, SC, and HQ values also see notable improvements, further reinforcing the superiority of a lag order of 1. The comprehensive analysis of various criteria unanimously points towards selecting a lag

order of 1 for the VAR model. This decision is underpinned by enhanced model performance metrics and improved capacity to capture the intricate dynamics among the variables.

Table-2: Lag Length Selection

VAR Lag Order Selection Criteria						
Lag	Log L	LR	FPE	AIC	SC	HQ
0	101.9714	NA	8.58e-10	-6.687680	-6.451940	-6.613849
1	278.9084	280.6587*	2.49e-14*	-17.16610*	-15.75165*	-16.72311*

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Table 3 presents the results of the ARDL Bounds Testing Analysis, crucial for determining the existence of a level relationship among the variables in the ARDL model. This analysis is pivotal for understanding the long-term dynamics and interactions among the variables under consideration. The F-Statistic obtained from the bounds testing procedure is 6.9358, indicating the overall significance of the level relationship. Additionally, the 95% lower and upper bounds for the F-Statistic are reported as 4.1833 and 5.6299, respectively. These values serve as critical thresholds for assessing the significance of the F-Statistic. Moreover, the 90% lower and upper bounds for the F-Statistic are provided as 3.4495 and 4.6655, respectively. These bounds offer a slightly wider range for evaluating the significance of the F-Statistic, providing additional insights into the robustness of the level relationship among the variables. The F-Statistic and its corresponding bounds provide essential information regarding the presence of a level relationship in the ARDL model. The significance of these values underscores their utility in determining the long-term associations among the variables, thereby aiding in informed decision-making and policy formulation.

Table 3: The ARDL Bounds Testing Analysis

Testing for existence of a level relationship among the variables in the ARDL model				
F-Statistic	95% Lower Bound	95% Upper Bound	90% Lower Bound	90% Upper Bound
6.9358	4.1833	5.6299	3.4495	4.6655

Table 4 illustrates the outcomes of the long-run analysis concerning the dependent variable LM and various regressors. This examination is pivotal for comprehending the enduring relationships between the dependent variable and the independent variables. For the constant term (C), the coefficient reflects a negative value, suggesting a certain impact on LM. However, its significance level, indicated by the p-value, is marginally below the conventional threshold, indicating a potential influence with slight uncertainty. Regarding the LFC variable, its coefficient indicates a positive relationship with LM, implying that changes in LFC are associated with changes in LM over the long term. This relationship is statistically significant, signifying a robust influence. Similarly, the LI variable exhibits a positive coefficient, indicating a relationship with LM. This relationship is not only positive but also statistically significant at a high confidence level, suggesting a substantial and reliable impact on LM. The LX variable also demonstrates a positive coefficient, indicating its association with LM. This association is statistically significant, underscoring its meaningful impact on LM over the long term. Conversely, the LRP variable's coefficient suggests a negligible influence on LM, as indicated by its insignificance. This implies that changes in LRP may not have a substantial effect on LM over an extended period. Lastly, the T variable's coefficient implies a negative relationship with LM. This relationship is statistically significant at a moderate confidence level, indicating a discernible impact on LM over the long run.

Table 4: Long Run Analysis

Dependent variable is LM			
Regressor	Coefficient	Standard Error	T-Statistic [P. value]
C	-47.4321	23.5692	-2.0125 [0.057]
LFC	1.4318	0.6671	2.1463 [0.044]
LI	0.35435	0.1033	3.4295 [0.003]
LX	1.3687	0.4682	2.9233 [0.008]
LRP	-0.0263	0.08218	-.32015 [0.752]
T	-0.1003	0.0471	-2.1275 [0.045]

Table 5 presents the outcomes of the short-run analysis, focusing on the dependent variable ΔLM and various regressors. This analysis provides insights into the immediate dynamics between the dependent variable and the independent variables.
The constant term exhibits a negative coefficient, indicating an initial impact on ΔLM. This coefficient is statistically significant, signifying a notable effect on ΔLM in the short run. The ΔLFC variable displays a positive coefficient, suggesting a positive relationship with ΔLM. This relationship is statistically significant, highlighting a substantial influence on ΔLM in the short term. Similarly, the ΔLI variable demonstrates a positive coefficient, indicating its association with ΔLM. This relationship is not only positive but also statistically significant at a high confidence level, underscoring a significant impact on ΔLM in the short run. The ΔLX variable also exhibits a positive coefficient, implying its positive relationship with ΔLM. This association is statistically significant, emphasizing a meaningful impact on ΔLM in the short term. Conversely, the ΔLRP variable's coefficient suggests a negligible influence on ΔLM, as indicated by its insignificance. This implies that changes in ΔLRP may not have a substantial effect on ΔLM in the short run. Lastly, the ECMt-1 variable's coefficient indicates a negative relationship with ΔLM. This relationship is statistically significant, suggesting an important role in the short-term adjustment process of ΔLM.

Table-5: Short Run Analysis

Dependent variable = ΔLM			
Regressor	Coefficient	Standard Error	T-Statistic [P. value]
Constant	-0.0608	0.0184	-3.2949 [.003]
ΔLFC	0.8690	0.2794	3.1099 [.005]
ΔLI	0.3306	0.0751	4.3981 [.000]
ΔLX	0.8307	0.1543	5.3820 [.000]
ΔLRP	-0.0159	0.0488	-.32660 [.747]
ECM_{t-1}	-0.6069	0.1507	-4.0273 [.001]

5. CONCLUSIONS

The import demand in Libya is intricately linked with various economic factors. The positive relationship with final consumption of households suggests that as household consumption increases, so does the demand for imports, indicating a reliance on foreign goods to fulfill domestic needs and preferences. Moreover, the significant positive association with domestic investment implies that as investment in the country's economy grows, there is a corresponding increase in the demand for imported goods, possibly for capital equipment or raw materials not readily available domestically. Furthermore, the positive and significant relationship with exports indicates a potential interplay between import and export activities, suggesting that imports may be complementary to Libya's export-oriented industries or serve as inputs for goods destined for foreign markets. However, the negative and insignificant relationship with relative prices signals that changes in the price levels of imports relative to domestic prices do not significantly impact import demand in the long run. This could imply that other factors, such as income levels, preferences, or trade policies, exert a stronger influence on import demand dynamics in Libya. The observed high elasticity of import demand concerning final household consumption and exports in Libya underscores the responsiveness of import levels to changes in these economic factors. A highly elastic import demand suggests that small fluctuations in household consumption and export levels can lead to relatively larger changes in import quantities, highlighting the importance of monitoring and managing these variables to ensure a balanced trade position.

Conversely, the inelastic nature of import demand concerning investment and relative prices implies that changes in these factors have a relatively smaller impact on import levels in the short run. While investment may not immediately affect import demand, long-term investment trends could still influence import dynamics over time, especially if investments lead to increased production capacities or changes in the composition of goods demanded by domestic industries. The significant relationships observed in the short run, except for relative prices, suggest that changes in final household consumption, investment, and exports can exert immediate effects on import demand in Libya. The absence of a significant relationship with relative prices in the short run may indicate that short-term fluctuations in import prices relative to domestic prices do not substantially alter import demand patterns, although this relationship may still be relevant in the long run. These insights into the short- and long-run dynamics of import demand in Libya provide valuable information for policymakers and stakeholders seeking to manage trade imbalances, promote economic growth, and enhance the efficiency of the country's trade relations. By understanding the factors driving import demand and their short- and long-term effects, policymakers can design more targeted and effective policies to support sustainable economic development and ensure a stable and prosperous future for Libya.

Indeed, recognizing the short-run inelastic behavior of import demand in Libya concerning various economic factors is crucial for policymakers when formulating import demand policies. While short-term fluctuations in factors like household consumption, domestic investment, exports, and relative prices may not significantly impact import levels, policymakers must still consider their potential longer-term effects and implications. By acknowledging the short-run dynamics and understanding the immediate impacts of these economic variables on import demand, policymakers can make informed

decisions to address immediate challenges and opportunities. For example, during periods of rapid economic growth or increased domestic consumption, policymakers may need to monitor import levels closely to ensure that they do not lead to unsustainable trade imbalances or strain on foreign exchange reserves. Furthermore, recognizing the long-run relationships and elasticity of import demand provides policymakers with insights into the underlying structural factors influencing import dynamics in Libya. Policies aimed at promoting sustainable economic development, enhancing export competitiveness, and improving domestic production capacities can be better tailored and implemented with an understanding of these long-term relationships. Ultimately, by integrating both short- and long-run considerations into import demand policies, policymakers in Libya can adopt a comprehensive and proactive approach to managing trade dynamics, promoting economic growth, and ensuring the stability and resilience of the country's economy in the face of global uncertainties.

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