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# Manufacturing Exports Drivers in Tanzania: The applicability of H-O Theorem

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***Abstract***
*This paper analyses the drivers of manufacturing exports in Tanzania to demonstrate the applicability of the Heckscher–Ohlin theorem through new trade theories in the manufacturing sector. The study hypothesises that: the labour force positively determines manufacturing exports; GDP has a positive impact on manufacturing exports; and manufacturing production has a positive impact on manufacturing exports. The paper employed the Autoregressive Distributed Lags (ARDL) approach. Lagged manufacturing exports, labour force and trade liberalisation were found to be significant drivers of manufacturing exports. The findings support the H-O theorem and its complements by new trade theories for the Tanzanian manufacturing sector. The paper bridges the gap by applying the combination of what the theorem advocates, its complementation by Kravis, Samuelson, Romalis, and the new trade theory insights in the Tanzanian context, and introduces a new conceptualisation of the international trade function. It recommends further initiatives to encourage exports from the manufacturing sector.*

***Keywords****: Manufacturing Exports, H-O theorem, ARDL, Tanzania.*

***JEL :*** *F11; F14; O14; O55*

## 1. Introduction

Tanzania aimed to become a semi-industrialised nation by 2025, with a focus on significant contribution from the industrial sector to the GDP. To achieve this, industrialisation, together with human development, has been insisted on as the key driver of the transformation process of the economy. The second phase of the Five-Year Development Plan (FYDP II) set the plan from 2016 to promote the environment for the private sector, the use of domestic inputs, and FDIs, which led to an increase in industries from 52,633 to 61,110, from 2015 to 2019, respectively (URT, 2021). This has increased employment to 482,601 people in 2019 from 254,687 people in 2015. On average, the growth of the industrial sector has been 8.3%, and the sector has contributed to GDP by 8.5% in 2019, which increased from 7.9% in 2015. Up to September 2020, the targets set in 2015/16 by the government were achieved by 75% (*ibid*).

Regarding the third phase of FYDP, (FYDP III), the manufacturing sector consists of furniture, food prods, transport equipment, trailers, motor vehicles; beverages; machinery and equipment; computer and electronics products; basic metals; tobacco products; rubber and plastics products;

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pharmaceutical and medical chemicals; textiles; chemical and chemical products; wood products and leather and related products. In the sector, small-scale establishments are currently dominating, while technologically advanced products are found in a few establishments (URT, 2021). Most of the undertakings are concentrated in the manufacture of furniture, wearing apparel, and food products. In Tanzania, primary exports still dominate, including semi-processed agricultural exports and minerals, of which the technological impact on domestic producers is low. This is why the FYDP III intended to increase the number of manufactured products that use medium- to high-technology that are produced domestically.

In recent years, the Tanzanian manufacturing sector has experienced remarkable growth. The sector's output increased by 12.73%, 2.28%, 6.85% and 9.32% in 2019, 2020, 2021 and 2022, respectively, with the output values rising from $5.19 billion in 2019 to $6.20 billion in 2022. The contribution of the manufacturing sector to Tanzania's GDP reached 23.2% in 2022, hence becoming a significant contributing component from the industrial sector (Tanzania Invest, 2024). This presses the need to identify how its markets are determined for its sustainable growth. Growth in real GDP of 5.3% in 2023, up from 4.7% in 2022, was contributed by manufacturing, together with agriculture and construction on the supply side (African Economic Outlook, 2024). These are evidence of the importance of the manufacturing sector to the Tanzanian economy.

The manufacturing exports contribution was the highest of all nontraditional exports in 2015/16 before becoming third in 2017/18 and 2018/19. Of all other non-traditional exports, manufactured goods made a maximum contribution of 27.3%, ahead of gold with 24.9%. Improvement in manufacturing exports had its roots in the growth of the manufacturing sector in Tanzania, whereby manufacturing activities grew by 6.5% from 2014 to 2015. Increased demand from the East African Community (EAC) and Southern African Development Community (SADC), together with electricity supply stability, were the main reasons for this increase. About 59% of manufactured goods were from the expansion in production activities of beverages, tobacco, and food. This contributed to the marginal increase of the manufacturing production index by 1.6% in 2015.

Though the share of industry and construction to GDP was still below that of agriculture, forest, and fishing, the contribution of manufacturing to the growth of GDP since 2011 was higher than that of agriculture, forest and fishing combined. Manufacturing contributed 6.9% in 2011, 4.1% in 2012, 6.5% in 2013, 6.8% in 2014, and 6.5% in 2015, while agriculture, forest, and fishing combined contributed 3.5% in 2011, 3.2% in 2012, 3.2% in 2013, 3.4% in 2014 and 2.3% in 2015 (BOT, 2016). Furthermore, BOT, in its 2016/2017 and 2017/2018 annual reports, revealed that as the country's economy sustained its growth at 7.0 and 7.1% in 2016 and 2017, respectively, manufacturing was among the strong drivers of this growth. In 2016, its contribution to GDP growth was 8.2%, being the fifth. This manufacturing contribution in 2016 was ahead of that of agriculture, forestry, and fishing by 1.6%.

Nevertheless, there was evidence that manufacturing activities grew from 6.5% in 2015 to 7.8% in 2016, whereas agriculture, forestry, and fishing activities fell from 2.3% to 2.1% (BOT, 2017). The improvement accelerated employment in the sector from 91,008 employees in 2015 to 95,678 in 2016. It was observed that the manufacturing sector continued to grow at the rate of 7.1% in 2017 due to an increase in the production of paper products, plastic products, chemicals, tobacco, rubber, food, petroleum, cement, and beverages. In addition, an increase in manufacturing exports was recorded to reaching USD 883.8 million in 2017 from USD 770.5 million recorded in 2016 (BOT, 2018).

According to the EAC Industrial Competitive Report (2017), the manufacturing value-added for Tanzania from 2000 to 2015 grew at 7.7%, on average, ahead of all other EAC members. Rwanda had an MVA growth rate of 6.9, Uganda (5.7), Kenya (3.4), and Burundi (-1.2). Though the country's MVA growth rate encountered a fall in the period of five years from 2010 to 2015, it regained its strength in 2015. Country's MVA per capita growth was above all other EAC members at the rate of 4.5%, followed by Rwanda (4.3), Uganda (2.3), Kenya (0.7), then Burundi (-4.5) from 2000 to 2015. Tanzania's share of MVA to GDP grew marginally from 6.2% in 2006 to 6.8% in 2015, which was stable compared to all other EAC members. Manufactured exports per capita experienced growth of 2.4% from 2010 to 2014, and in 2014 Tanzania's manufactured exports per capita were 46 USD, ranking second after Kenya with 59 USD. From 2000 to 2014, the country's manufactured exports per capita growth rate was 19.47%, the second from Uganda with a growth rate of 20.79%.

From these facts, it can be observed that Tanzania has experienced diversification of manufacturing exports since 2000, which is a good sign for global competition. In 2000, Tanzania mostly exported coke, refined petroleum, and rubber, followed by textiles, apparel, and leather, then food and beverages. In 2010, the country mostly exported metals, followed by chemicals and plastics, then textiles, apparel, and leather. Whereas in 2014, the country exported metals, followed by food and beverages, then textiles, apparel, and leather. These statistics show the changing composition as the country diversifies its manufacturing sector, which has contributed to its performance. This has been evidenced in an increase in manufacturing exports in various years of which recently, with the recent increase from $1321.6 in 2021 to $1402.2 in 2022 being recorded, showing signs of improvement (BOT, 2023). Understanding the current sector's export drivers is of importance for the purpose of sustaining its performance. This paper, therefore, examines manufacturing export drivers in line with proving the applicability of the H-O theorem in the Tanzanian manufacturing sector.

## 2. Literature Review

### 2.1 Theoretical framework

The Heckscher-Ohlin (H-O) theorem (the idea from Eli Heckscher in 1919 and Bertil Ohlin in 1933) predicts trade patterns by focusing on the nation's endowment, which determines the nation's ability to produce and export. Taking labour and capital for simplicity, the theorem means that if the nation is labour-endowed, it should export labour-intensive commodities since to that nation, labour is abundant and cheaply available. On the other hand, if the other nation is capital-endowed, it should export capital-intensive commodities because to this nation, capital is cheaply available. This makes two nations gain from trade at a relatively lower cost. This paper aims to get a sense of the applicability of factor endowment in the Tanzanian manufacturing sector. The theorem is considered over the absolute advantage theory. For Adam Smith, two countries should engage in international trade if each has an absolute advantage in producing either of the commodities being traded. A country may have an absolute disadvantage in producing all the commodities being traded. The question was, "Does that country have no importance in engaging in international trade?" This was answered by David Ricardo when he came up with another international trade theory by maintaining that, even though there is great importance for the country with an absolute disadvantage in producing all commodities, it should engage in international trade. This is because there is no self-sufficient nation that does not need other nations for its development. It may seem to have the absolute advantage in all things, but comparatively, it might be producing others at a higher opportunity cost. Thus, from here, the theory of comparative advantage was raised, where a nation should specialise, produce and export a commodity that it produces at a lower opportunity cost and import the other, which it produces at a higher opportunity cost. David Ricardo did not go into detail to explain the basis of this comparative advantage. To Ricardo, the comparative advantage was simply due to factor productivity. The H-O theorem extends the ideas from a broader perspective by explaining the basis for comparative advantages.

The theory assumes two production factors: capital and labour, two commodities (X and Y) and two nations (1 and 2). It also assumes technology to be constant in both nations, where commodity Y is capital-intensive, and commodity X is labour-intensive. In addition, constant returns to scale and incomplete production specialisation in both nations are assumed. Both nations are assumed to have equal tests, and there is perfect competition in factor markets and commodities. There is an assumption that factor mobility is perfect within each nation and not internationally, and there are no international trade barriers. Nevertheless, full employment for both nations and balanced trade is also assumed by the theory. The theory clarifies that factor prices and endowment mainly cause differences in the relative prices of the commodity in two nations. Then, in two nations, relative prices of commodities and relative factor differences translate to a difference in prices of commodities and absolute factors.

The empirical test of this theorem by Wassily Leontief in 1951 found the opposite of what it says. The study done in the US using the 1947 data found that the US was exporting more labour-intensive commodities and importing more capital-intensive commodities. Since it was believed that the US was a capital-abundant nation, it should have exported capital-intensive commodities and imported labour-intensive commodities. This was named the Leontief Paradox. In a further follow-up of this theorem and trying to address the Leontief Paradox, Irving B. Kravis came in, testing whether cheap labour contributed to the exportation of labour-intensive commodities in 1956. While doubting the same technology assumption, he found that in all countries, labour was highly paid in industries that produced for exportation. That is why he concluded that, in that sense, a country should export the available products since the primary determination of international trade is the availability of the commodities, regardless of how they are produced. By this, Kravis meant that a country should export commodities that are available in greater quantities than what is needed by the domestic market and import what is unavailable in the nation. This criticism of the H-O theorem came up with the modification known as the availability theory of international trade. Kravis pointed out that factors determining availability include product differentiation, technical change, availability of natural resources and a country's policies (concerning trade protectionism). Other factors are technical know-how as well as a temporary production monopoly.

**2.2 Theoretical Conceptualisation**

The Heckscher-Ohlin (H-O) theorem and its extension, the Heckscher-Ohlin-Vanek (HOV) theorem, face various criticisms, especially due to challenges encountered in its applicability. The main criticisms are briefly discussed. The theorem seems to rely on several unrealistic assumptions. These include the absence of transport costs, no qualitative differences in factors of production, identical production functions, and constant returns to scale. The model also places more emphasis on supply than demand in determining factor prices. However, if demand plays a greater role, a capital-abundant country may end up exporting labour-intensive goods due to the high cost of capital driven by increased demand. Additionally, the theory overlooks the influence of consumer demand on commodity prices. In addition, like the Ricardian theory, the H-O model is static, assuming a fixed economic state and unchanging production functions. It also fails to account for other factors that affect international trade, such as technology, production techniques, natural resources, and varying labour quality.

Nevertheless, the theorem is challenged by its weak empirical evidence. The empirical support for the HOV theorem, which predicts that countries export goods that heavily utilise their abundant factors, has been weak. A key assumption of the HOV model is that all countries use identical constant-returns-to-scale technologies. However, real-world evidence does not consistently align with this prediction (Hakura, 1999). In addition, the HOV model assumes that goods have equal prices internationally, an assumption invalidated by trade barriers such as tariffs and transport costs. Research has shown that trade barriers contribute to the model's weak empirical performance. For example, Davis *et al.* (1997) found that the HOV model works better within regions of free trade. However, its reliability in groups of countries with differing trade policies remains questionable.

Failure to explain the location of production is another limitation of the HOV. The strict HOV model cannot explain why production is concentrated in certain countries, as it assumes universal equality in factor prices. This assumption does not hold in practice due to variations in technology, policies, and market conditions. Davis *et al.* (1996) demonstrated that relaxing this assumption improves the model's ability to explain observed global production patterns. Additionally, the model inaccurately applies domestic input techniques to imported intermediate goods, leading to potential misinterpretations. For instance, if a country imports components for assembly, the model might erroneously assume that the production methods in the exporting country are the same as those used domestically. This could result in incorrect conclusions about factor endowments and comparative advantage (Hakura, 1999). Home bias in consumption being another constraint, the HOV model assumes that countries consume goods in the same proportions, regardless of income, preferences, or local tastes. This oversimplifies reality, as countries often favour domestic products, a phenomenon known as "home bias." Factors contributing to home bias include transport costs, tariffs, and preferences for domestic goods. The model also fails to consider differences in production technologies and utility functions across countries, further weakening the theorem's applicability to real-world trade flows (Leamer, 1995).

The H-O theorem was developed, but the author did not test it empirically; instead, they relied on historical information. The essence of this paperis to empirically test and observe whether the model is supported by data on manufacturing exports from Tanzania. Based on its assumptions of two countries, two commodities, and two factors of production (2-2-2), the theorem allows for extensions that allow empirical testing of its applicability. This is where the notion of multiple countries ($MC$), multiple goods ($MG$) and multiple factors ($MF$) comes in as the extension of the model by Paul Samuelson in 1949 and 1953. Other things taken into consideration, extension could include human capital ($HC$), oduct differentiation ($PD$) and technology ($TD$). Allowing differences in technologies reflects the realities in today's trade, making the price equalisation factor inapplicable. Kravis, on the other hand, conceptualised that international trade is determined by commodity availability ( $CA$ ). Then $CA$ is determined by product differentiation ($D$), technical change ($TC$), natural resources availability ($RA$), country's policies ($P$), technological know-how ($TK$), and temporary production monopoly ($M$) (*ibid*). Extension by Romalis (2004) gives a more general picture by considering specifically factor abundance in proportions and product differentiation (PD) through economies of scale (ES) and technological differences (TD).

With this understanding, it can be thought that multiple countries (MC) intend to mean the exporting country and the destination countries which receive their exports, as well as the effect of the network (EN). Multiple goods (MG) can be taken as the product differentiation (PD) as well as technology or technological differences (TD). Multiple factors (MF) here intend to mean more factors of production than capital and labour, which include natural resources availability ($RA$), country's policies ($P$) and temporary production monopoly ($M$).

The H-O theorem has been a debate in its applicability, as its empirical test by several economists has rejected its principal hypothesis. The focus of this paperis to observe whether it is still possible for a country with labour endowment to produce and export capital-intensive products by allowing technology to vary, allowing more than two countries to trade and allowing the effect of network as well as increasing returns to scale (relaxing various important assumptions of H-O) hence bringing in the intuition of extensions by Samuelson, Romalis as well as that of new trade theory. Therefore, this paper combines what was advocated by H-O theorem and its complementation by Samuelson, Kravis, Romalis and the insights of the new trade theory, and it comes in with a new conceptualisation that the international trade function should be specified as

$$international\ trade = f(MC, PD, HC, P)$$

Where $MC$ stands for multi-country factor, $PD$ stands for product differentiation, $HC$ stands for human capital, and $P$ stands for the country's policy. Here, MC takes the destination of Tanzanian manufacturing exports and the effect of the network.

The new functional form framework suggested by this paperis that the international trade is the function of multiple countries (which takes the policy designed by Tanzania from 2003 to use exports to multiple countries as the source of economic growth and which also affect its international network), product differentiation (which takes technological differences leading to multiple manufacturing products), human capital (which takes labour as well as resource availability or endowment). This means for labour-endowed countries, this variable will mean labour and resource availability, but for capital-endowed countries, there should be two different variables: human capital and resource availability.

The theory determines the variables to include in the model used to analyse this concern. But they should be complemented by other control factors like exchange rates, inflation, the country's policies, and GDP. This is the modification of what H-O and Kravis considered in their formal analysis. Therefore, the variables in the new conceptualised function are specified as

$$MEXP = f(LF, GDP, EXCH, INFL, POLICY, PROD)$$

Where: $MEXP$ stands for exports from the manufacturing sector, $GDP$ stands for real GDP, $EXCH$ stands for the exchange rate, $INFL$ stands for inflation, $POLICY$ stands for a policy of the country and $PROD$ is output from the manufacturing sector.

## 2.3 Empirical Literature Review

### 2.3.1 Applicability of the H-O Theorem

Empirical analysis of the applicability of the H-O theorem has given varied responses. Klinger *et al.* (2023) argue that while Tanzania's abundant labour and natural resources align with the H-O theorem, the country's limited technological capacity and skill gaps undermine its potential to fully leverage these advantages. Mufuruki *et al.* (2017) emphasise the need for a nuanced approach that integrates the H-O theorem with modern trade theories. They highlight the role of strategic policy interventions in addressing structural and institutional challenges that limit the sector's growth. They support the partial applicability of the H-O theorem, particularly in explaining resource-based exports. However, both studies note that new trade theories offer a more comprehensive understanding of Tanzania's export patterns by incorporating elements like innovation and market access. They highlight the limitations of the H-O framework in the Tanzanian context, arguing that the country's manufacturing sector requires a focus on diversification and value addition to align with global trade dynamics. Adopting new trade theories is among the approaches to address challenges in competitiveness and export growth.

Rodrik's (2016) seminal work, 'An African Growth Miracle?', provides a robust analytical framework for understanding Africa's economic growth patterns, with implications for the manufacturing sector. The author highlights the structural transformation of African economies as a key driver of growth, emphasising the shift from agriculture to manufacturing and services. The study underscores the role of institutional quality, human capital, and macroeconomic stability in sustaining growth. Specifically, it identifies trade liberalisation, regional integration, and infrastructure development as pivotal for fostering manufacturing exports. A notable argument is that Africa's growth, including Tanzania's, exhibits features of a "miracle" due to its resilience against global economic shocks and steady improvement in governance. However, Rodrik cautions that the growth trajectory is uneven and susceptible to structural bottlenecks such as low productivity and weak industrial capacity.

Rodrik's analysis provides indirect support for the H-O theorem's applicability to resource-abundant economies like Tanzania. By highlighting Africa's comparative advantage in labour-intensive and resource-based industries, the study aligns with the theorem's premise that factor endowments shape trade patterns. However, Rodrik also acknowledges the limitations of traditional trade theories in capturing the dynamic and evolving nature of global trade. The study's insights on structural transformation suggest a need for integrating H-O principles with new trade theories that account for economies of scale, technological diffusion, and global value chains. Rodrik's work provides a macroeconomic perspective that complements micro-level studies on Tanzania's manufacturing sector. However, its generalised focus on Africa may overlook specific challenges unique to Tanzania, such as regional disparities and sector-specific bottlenecks. While the study offers valuable policy recommendations, a more nuanced analysis of country-specific dynamics would enhance its applicability. Rodrik (2016) offers a valuable lens for understanding the drivers of manufacturing exports in Tanzania and the broader applicability of the H-O theorem. The study's emphasis on structural transformation, institutional quality, and human capital aligns with contemporary debates on Tanzania's industrialisation strategy.

Rodrik's emphasis on structural transformation aligns closely with the drivers of manufacturing exports identified in Tanzanian-focused studies. Key parallels include infrastructure development, institutional quality, and human capital. For infrastructure development, Rodrik's findings resonate with Klinger *et al.* (2023) and Mufuruki *et al.* (2017), who identify inadequate infrastructure as a significant barrier to manufacturing competitiveness in Tanzania. Investments in transport, energy, and digital infrastructure are critical to enhancing export performance.

### 2.3.2 Drivers of Manufacturing Exports

Drivers of manufacturing exports refer to the factors determining manufacturing exports. There are various drivers put forward by various authors from all over the world. When the same was examined in Greece, the impact of technological stock and lowering price ability were revealed to be the main determining factors. The export demand function was augmented by supply factors, and non-price as well as price-competitive measures were used to analyse the problem (Bournakis, 2012). For Thailand, skilled labour, location, assistance from the government, labour productivity, size of the firm, age of firm, FDI and R&D, collectively termed as firm-specific factors are important determinants of export performance, whereas, competitiveness gain in manufacturing industries is one of the essential factors that account for growth in manufacturing exports, by using input-output model, together with a method of constant market share (CMS), in Croatia (Amornkitvikai *et al.,* 2012; Buturac *et al.,* 2019).

By extending the traditional export demand function, using the dynamic panel models with a system of GMM estimator, for European Union members, it was found that, production in industries, local demand, and foreign demand are other important drivers of exports of manufacturing products, whereas, Building on comparative advantage theory and the global value chain framework, low labour costs, quota system elimination, exchange rate, and tariff were found as the comparative advantage for Asian countries in accelerating manufacturing exports (Sertic *et al.,* 2015; Wang, 2013). Other studies that have considered macro variables at the level of the sector in Asia include Akhtar *et al.* (2015) for Pakistan and Suresh and Aswal (2014) for India. Most variables that determine manufacturing exports include FDI, exchange rate, technology value-added, GDP and the difference in per capita income across these countries. All authors employed time series data and the time series techniques in analysis.

Foreign income and the ratio of investment to GDP, firm size, access to transport and telecommunication, access to finance and firm age, proved to positively affect export performance, for Namibia, Botswana and India (Kaakunga and Matongela, 2012; Sebolao *et al.,* 2019; Pradhan and Das, 2012). Approaches applied include the Johansen cointegration procedure and error correction model for Namibia, and cross-sectional techniques for Botswana and India. For East Africa, performance in exports, in general, is driven by industrialisation, exchange rate, labour force and FDI. In addition, performance in exports was revealed to be negatively affected by inflation, while GDP turned out to be an insignificant factor. The panel data technique of six East African countries for the years 1990 to 2014 was applied by Uysal and Mohamoud (2018) when analysing the determinants of exports in East Africa. By cross sectional techniques, scanning export markets frequently, external environment information analysis, consumer test and preference review, and product advancement for changes in markets are the factors to be considered by Kenyan manufacturing firms to improve their export performance, while, being chemical and agro-based exporting firms, firm size, Asian ownership, and higher capital labour ratios were the significant determinants of export propensity in Uganda, by using probit and tobit techniques (Kabue *et al.,* 2019; Niringiye and Tuyiragize, 2010).

Tanzanian exports, in general, are determined mainly by real GDP per capita, exchange rate and trade liberalisation. Using Error Correction modelling, a negative relationship between official assistance development and exports was also found, meaning policies and strategies by the government to search for markets have not yet provided the required fruits (Epaphra, 2016). Factors hindering export performance generally were identified as the national business environment, the fear of export markets by SMEs' owners, and the competencies of SMEs to export (Mpunga, 2016). This was because, in the 2000s, the SMEs sector was tremendously expanding in Tanzania while focusing only on domestic markets, instead of focusing on both including export. Marandu (2008) found most of the factors affecting manufacturing firms' performance in exports to be quality, product promotion, adoption, number of markets, number of products offered, and competitors for both firms that perform highly in exports and those with low performance in exports. On the other hand, price competitiveness was revealed to be a significant factor affecting export performance for high-performing firms rather than for low-performing ones (*ibid*). Analysis methods of statistics were employed; the t-test was used for ordinal and interval data in comparing mean differences in categories, and the Chi-square test was used for nominal data in comparing frequencies from the cross-tabulation approach.

Klinger *et al.* (2023) identify infrastructure deficits, limited access to finance, and low productivity as critical barriers to export growth. Their findings underscore the importance of strategic investment in industrial clusters and public-private partnerships to enhance competitiveness. Mufuruki *et al.* (2017) provide an in-depth analysis of Tanzania's industrialisation journey. Their work highlights the importance of aligning national industrialisation policies with global trade trends. They argue that sustainable growth in the manufacturing sector requires significant investment in human capital, infrastructure, and innovation.

The reviewed literature reveals a consensus on the structural and institutional barriers impeding the growth of Tanzania's manufacturing exports. While the H-O theorem provides a foundational framework for understanding resource-based exports, its limitations in addressing modern trade dynamics necessitate the integration of emerging trade theories. Applicability of the theorem to Tanzania's manufacturing sector has been limitedly done and has not considered combining what the theorem advocates and its complementation by Kravis, Samuelson, Romalis and the new trade theory insights. This gap has motivated the current paperto analyse the drivers of manufacturing exports in Tanzania, to demonstrate the theorem's applicability through the lens of new trade theories in the manufacturing sector.

## 3. Methodology

### 3.1 Model Specification

The open economy national income identity given by Wickens (2008) is considered in formulating the functional form. This is because exportation is found in an open economy where the national income is not only determined by domestically produced and supplied commodities and services, but also by products supplied even outside the country's boundaries. The identity is specified as:

$$y_t = c_t + i_t + x_t - Q_t x_t^m \qquad (1)$$

Where $y_t$ denotes national income, $c_t$ and $i_t$ denotes domestic expenditures on consumption and investment, respectively, $x_t$ refers to exports and $x_t^m$ refers to imports in real foreign prices, while $Q_t$ denote the exchange rate at the GDP deflator as well as terms of trade. The nominal form of this identity is given as

$$Y_t = C_t + I_t + X_t - X_t^m \qquad (2)$$

Rearranging (2) gives:

$$X_t = Y_t - I_t - C_t + X_t^m \qquad (3)$$

Giving the intuition that:

$$X = f(Y, I, C, X^m) \qquad (4)$$

Expression in (4) tells that export ($X$) is the function of domestic output ($Y$), investment in domestic production ($I$), domestic consumption ($C$), and imports ($X^m$).

Based on the Heckscher-Ohlin theorem and its complements by new trade theories, this paperspecifies the manufacturing export function by including labour since it is the factor with which Tanzania is endowed. The function is modified by including other relevant variables (as was put forward in the theoretical literature review), and the relationship in (4) is therefore given as:

$$MEXP = f(LF, GDP, EXCH, INFL, POLICY, PROD) \qquad (5)$$

Where $MEXP$ is manufacturing exports performance, $LF$ is the labour force, $GDP$ is real GDP, $EXCH$ is the exchange rate, $INFL$ is inflation, $POLICY$ is the country’s policy (when the country adopted an export-led growth policy), and $PROD$ is manufacturing output.

Adopting the linear functional form used by Wickens, function (5) can be expressed as:

$$MEXP_t = LF_t + GDP_t + EXCH_t + INFL_t + PROD_t + POLICY_t \qquad (6)$$

A dummy variable is introduced for significant structural challenges that occurred in the history of the Tanzanian economy, affecting international trade (which is mainly the trade liberalisation policy adopted in the 1980s). Then the econometric model is specified as:

$$MEXP_t = \beta_0 + \beta_1 LF_t + \beta_2 GDP_t + \beta_3 EXCH_t + \beta_4 INFL_t + \beta_5\, PROD_t + \beta_6\, POLICY_t + \beta_7 dummy + \varepsilon \qquad (7)$$

Where$\beta_0$, $\beta_1$, $\beta_2$, $\beta_3$, $\beta_4$, $\beta_5$, $\beta_6$, and $\beta_7$, are coefficient parameters. While $\varepsilon$ is the error term.

Due to theoretical underpinning, variables such as FDI, the business environment and technology were not explicitly included in the model. As the H-O model emphasises differences in factor endowments (e.g., labour, capital, land) as the primary determinants of trade patterns, variables like technology, FDI, and business environment might be taken as institutional factors that are outside the scope of a pure factor-endowment-driven analysis. These variables either adjust in the long run or become endogenous to the factor endowments. Nevertheless, variables such as technology and FDI may be endogenously determined by the export structure itself, making it difficult to establish the impact. It is important to note that in low-tech countries like Tanzania, technology is not a critical determinant of manufacturing exports as compared to high-tech countries. While the H-O model seeks to explain trade based on comparative advantage derived from factor endowments, business environments, and FDI variables are contributors to competitiveness rather than determinants of comparative advantage.

**3.2 Methods of Estimation**

The paperemploys time series techniques to estimate the specified model in (7). Macro time series variables, in most cases, do exhibit challenges where a variable may have a mean, which tends to change as time changes and may have a variance that is not constant (non-constant moments). This is referred to as the unit root problem or non-stationarity problem, which makes the variable at the current time closely related to its past. This further means statistical properties of time series data (mean, variance, autocovariance) do change over time. Estimation of the variables of this nature with the traditional OLS may lead to spurious (or nonsensical) regression with high $R^2$ and significant t-statistics even when there is no meaningful relationship between variables, and unreliable estimates where coefficients and standard errors may not have valid interpretations. This is because the normal OLS approach assumes that the underlying variables are stationary. Using non-stationary data is the violation of this crucial assumption. Therefore, this makes the test for unit root necessary when dealing with time series macro variables and employing the accommodative approach that can address the non-stationarity issue, a fact taken into consideration by this study.

**3.3 Autoregressive Distributed Lag (ARDL) Model**

This paper uses the ARDL model for the estimation, of which the specification is given as:

$$\Delta MEXP_t = \beta_0 + \sum_{i=1}^{n} \gamma_i \Delta MEXP_{t-i} + \sum_{i=0}^{m_1} \varphi_{i1} \Delta RGDP_{t-1} + \sum_{i=0}^{m_2} \varphi_{i2} \Delta EXCH_{t-1} + \sum_{i=0}^{m_3} \varphi_{i3} \Delta LF_{t-1} + \sum_{i=0}^{m_4} \varphi_{i4} \Delta INFL_{t-1} + \sum_{i=0}^{m_5} \varphi_{i5} \Delta PROD_{t-1} + \theta_1 POLICY + \theta_2 dummy + \delta Ect_{t-1} + \mu_t \quad (8)$$

The coefficient $\delta$ from equation 8 is the adjustment speed in the long run while $\gamma_i$ and $\varphi_{ij}$ are the short-run dynamic coefficients of the model's convergence to equilibrium.

To estimate the ARDL, the procedure for testing for the number of cointegrating vectors in a multivariate setting and restrictions on economic theories is explicitly examined. In addition, the ARDL model allows for more than one evolving variable, extending the univariate autoregressive (AR) model to dynamic multivariate time series (Enders, 2003). Here, every variable is treated as explained and has an equation explaining its evolution based on its lags and the lags of the other variables of the model.

### 3.4 Data and Data Sources

The paper makes use of secondary time series data from the year 1970 to 2022. Bank of Tanzania, National Bureau of Statistics and the Ministry of Finance and Planning were consulted. IMF, World Bank, Penn World Table and International Financial Statistics were consulted to supplement missing information from the stated sources.

## 4. Results and Discussion

### 4.1 Summary Statistics

The summary of the statistics shows the total number of years is 53 from 1970 to 2022. The mean value for manufacturing exports is TZS 1.04 trillion, manufacturing production is TZS 2.92 trillion, and real GDP is TZS 39 trillion. This means, on average, manufacturing exports for 53 years are about 36% of the total manufacturing output produced and are equivalent to about 2.67% of real GDP for the same period. Here, most of the output produced from the manufacturing sector has been consumed domestically. Therefore, on average, there is still room for expanding exportation from the manufacturing sector for it to contribute more than 2.67% to the country's GDP. The maximum GDP attained by the country for 53 years is about TZS 123 trillion, of which 8.4% has been contributed by the manufacturing sector. To this maximum amount reached by the country's GDP, about 4.9% has been contributed by exports from the manufacturing sector.

For 51 years, on average, the country has experienced economic growth of about 4.4%, and the growth reached its maximum of 8.5% in 2007 before maintaining an average growth of about 7% from 2011 to 2017. The mean value for the exchange rate is 741.102, with a minimum of 7 and a maximum of 2294. This shows that the country's currency has been continuously depreciating as compared to the US dollar since the 1970s. The inflation rate reached its maximum rate of 36.1 in 1984, which necessitated measures to control it to be taken, which have yielded fruits, as up to 2020, it reached a rate of 3.3. The country's capital stock has grown, as its minimum of TZS 6.6 billion in 1970 was far below the minimum value of GDP by about 5 times. For 53 years, it has averaged TZS 10.1 trillion. On the other hand, the labour force increased from its minimum of 6 million people in 1970 to 28 million people in 2022. This marks an increase of more than 4 times for 53 years from 1970. This summary of these statistics is presented in Table 1.

**Table 1: Summary Statistics**

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| **YEAR** | 53 | | | 1970 | 2022 |
| **MEXP** | 53 | 1,040,000 | 2,670,000 | 70,500 | 10,300,000 |
| **GDP** | 53 | 39,000,000 | 35,700,000 | 3,430,000 | 123,000,000 |
| **EXCH** | 53 | 741.1135 | 769.3579 | 6.9 | 2294.146 |
| **INFL** | 53 | 15.60075 | 11.10841 | 2.4 | 36.1 |
| **PROD** | 53 | 2,920,000 | 12,200,000 | 1,230 | 83,600,000 |
| **LF** | 53 | 13.49175 | 6.172274 | 5.73 | 28.00223 |

***Source:*** Author's analysis based on World Bank Data, 2023

### 4.2 Drivers of Manufacturing Exports

To take care of the non-normality problem, variables were transformed by using a natural logarithm, except inflation, which is already in the form of rates. All variables were subjected to a unit root test and found to have the unit root problem; they were not stationary. They were differenced once as the action to address non-stationarity, and they became stationary. This means these variables are integrated of order one [*I (1)*]. Due to this fact, it was not appropriate to use the normal OLS in analysing the variables of this nature. Table 2 summarises the results.

**Table 2: Results for Unit Root Test**

| | **Augmented Dickey-Fuller** | | | | |
|---|---|---|---|---|---|
| | **At levels** | | **After first difference** | | |
| **Variable** | Test Statistics | Critical value (5%) | **Variable** | Test Statistics | Critical Value (5%) |
| **lnMEXP** | -0.194 | -2.933 | **D.lnMEXP** | -5.931*** | -2.936 |
| **lnPROD** | -0.701 | -2.933 | **D.lnPROD** | -7.445** | -2.936 |
| **INFL** | -1.553 | -2.933 | **D.INFL** | -6.027 *** | -2.936 |
| **lnEXCH** | -1.058 | -2.933 | **D.lnEXCH** | -3.749*** | -2.936 |
| **lnGDP** | -0.717 | -2.933 | **D.lnrGDP** | -4.841 *** | -2.936 |
| **lnLF** | 0.995 | -2.933 | **D.lnLF** | -3.245** | -2.936 |

Where *, ** and *** represents stationary at 10%, 5% and 1% significance levels, respectively

Source: Author's analysis based on World Bank Data, 2023

Since all variables were revealed to be integrated of the same order [*I (1)*], cointegration test was done. Identification of maximum lags to be included in the model was done by using the combination of lags length determination techniques suggested by Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion (HQIC) and Schwarz Bayesian Information Criterion **(**SBIC**)**. The results show that all the criteria support the selection of two lags as presented in Table 3.

**Table 3: Selection of Number of Lags**

| Lag | LL | LR | Df | P | FPE | AIC | HQIC | SBIC |
|---|---|---|---|---|---|---|---|---|
| 0 | -40.4183 | | | | 0.422643 | 1.97525 | 2.06413 | 2.21144 |
| 1 | -35.9132 | 9.0103 | 1 | 0.003 | 0.364382 | 1.82609 | 1.92979 | 2.10165 |
| 2 | -33.9368 | 3.9527* | 1 | 0.047 | .349943* | 1.78455* | 1.90305* | 2.09946* |
| 3 | -33.8599 | 0.15386 | 1 | 0.695 | 0.364487 | 1.82383 | 1.95714 | 2.17811 |
| 4 | -33.2567 | 1.2063 | 1 | 0.272 | 0.371367 | 1.84071 | 1.98884 | 2.23436 |

* Shows maximum lag suggested by Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Hannan-Quinn Information Criterion (HQIC) and Schwarz Bayesian Information Criterion (SBIC)

***Source:*** Author's analysis based on World Bank Data, 2023

Cointegration test results, by the use of the ARDL bounds test, are presented in Table 4

**Table 4: ARDL Bound Test for Cointegration**

| $H_0$: No level relationship | | | | | | F = 5.051<br>t = -4.379 |
|---|---|---|---|---|---|---|
| | **10%** | | **5%** | | **1%** | |
| | I(0) | I(1) | I(0) | I(1) | I(0) | I(1) |
| F | 2.417 | 3.669** | 2.892 | 4.292* | 4.001 | 5.731 |
| T | -2.521 | -3.829** | -2.866 | -4.236* | -3.564 | -5.048 |

Where *, ** and *** represents level relationship at 10%, 5% and 1% significance level respectively

***Source:*** Author's analysis based on World Bank Data, 2023

From Table 4, it was found that there is cointegration as the value of the F statistic (5.051) is greater than the value of the upper bound of F (4.292 and

3.669) at 5 as well as 10% significance levels, respectively. The t-statistic value (-4.379) is greater (in absolute values) than the upper bound value of -4.236 and -3.829 at 5 and 10% significance levels, respectively. These results reject the null hypothesis of no level relationship, hence supporting that there is a level relationship.

Based on cointegration results, the Autoregressive Distributed Lag (ARDL) model was estimated with its error correction approach to analyse both short and long-run relationships between manufacturing exports and economic growth. The results are shown in Table 5.

**Table 5: ARDL Error Correction Model Results**

| | D. $\ln MEXP_t$ | Coefficient | Std. Error | t-value | P-value | 95% Conf. | Interval |
|---|---|---|---|---|---|---|---|
| **ADJ** | $\ln MEXP_{t-1}$ | -0.463 | 0.139794 | -3.31 | 0.002*** | -0.74625 | -0.17976 |
| **LR** | $\ln GDP_t$ | 0.50573 | 1.245738 | -0.41 | 0.687 | 3.02984 | 2.018373 |
| | $\ln EXCH_t$ | 0.963545 | 0.767467 | 1.26 | 0.217 | -0.59149 | 2.51858 |
| | $\ln PROD_t$ | 0.135797 | 0.469158 | 0.29 | 0.774 | -0.81481 | 1.086402 |
| | $\ln LF_t$ | 4.488156 | 1.876331 | 2.39 | 0.022** | 0.686349 | 8.289964 |
| | $INFL_t$ | 0.011459 | 0.030107 | 0.38 | 0.706 | -0.04954 | 0.072462 |
| | Policy | 1.15571 | 0.805882 | -1.43 | 0.16 | -2.79174 | 0.480315 |
| | Dummy | 0.742368 | 0.660134 | 1.12 | 0.268 | -0.59778 | 2.082512 |
| **SR** | D. $\ln LF_t$ | 15.09041 | 7.21811 | 2.09 | 0.043** | 0.465128 | 29.71569 |
| | D. $\ln MEXP_{t-1}$ | 0.28 | 0.129795 | 5.31 | 0.005*** | -0.64627 | -0.16978 |
| | Cons | 7.790955 | 14.44856 | 0.54 | 0.593 | -21.4846 | 37.06652 |

***No. of obs = 49; F (11, 37) = 3.59 [0.042]; R-squared = 0.5769***

Where *, ** and *** show the significance of the variables at 10%, 5% and 1%, respectively

***Source:*** Author's analysis based on World Bank Data, 2023

The results in Table 5 show that there are both short-run and long-run relationships. In the short run, the main drivers of the performance of manufacturing exports were revealed to be manufacturing exports of one previous year (D. $lnMEXP_{t-1}$) and labour force (D. $lnLF_t$). Manufacturing exports are statistically significant at 1% with the probability value of 0.005, leading to rejection of the null hypothesis that there are zero significant relationships between the exogenous and endogenous variables, while labour force is significant at 5% with a probability value of 0.043. A 1% increase in previous manufacturing exports causes an increment of current manufacturing exports by 0.28%. This rate reveals the gradual contribution of this factor to manufacturing exports. Nevertheless, the 1% increase in the labour force causes an increment of about 15% in manufacturing exports, hence a considerable impact.

In the long run, the labour force has a significant effect on manufacturing exports, as well. It is statistically significant at a 5% significance level with a probability value of 0.022. The 1% increase in the labour force causes an increase of 4.49% in manufacturing exports. From the results in Table 6, the coefficient for the error-correcting term (**ADJ** $ln\ MEXP_{t-1}$ ) is -0.46, approximately -0.5 and statistically significant at 1% with a probability value of 0.002. This means the system is adjusting from disequilibrium to equilibrium at the speed of about 0.5%. Policy, dummy, real GDP, exchange rate, inflation, and manufacturing output variables were revealed to have no significant impact on manufacturing exports in both the short and long run.

These results are reliable since the F statistic, the test statistic for the overall significance of the model, has a p-value of 0.042, which is statistically significant at 5%. This means all explanatory variables taken together significantly determine manufacturing exports. The value of R-squared is 0.5769, equivalent to 58%. This shows that the model has reasonable goodness of fit, which means variations in independent variables explain the rate of variations in the dependent variable by 58%. Ramsey model specification test revealed that the model is well specified, with a probability value of 0.1743 of the F statistic, where the null hypothesis of no omitted variable cannot be rejected. Multicollinearity (with mean VIF value of 2.6, which is less than 10), autocorrelation (with Chi-square probability value of 0.0846 from Breusch-Godfrey) and heteroscedasticity (with Chi-square probability value of 0.1972 from Breusch-Pagan) problems were also not found, since the null hypotheses of no problems could not have been rejected.

### 4.3 Endogeneity consideration

Due to the nature of the economic relationship between GDP, Manufacturing production and Manufacturing exports, an endogeneity test was considered to address the challenge of reverse causality. Table 6 gives a summary of results after the endogeneity test.

**Table .6: Endogeneity test results**

| Dependent variable | Independent Variables | Coefficient |
|---|---|---|
| $lnMEXP_t$ | $\mathrm{lnLF_t}$ | 15.642* |
| | Residual ($\mathrm{lnGDP_t}$) | -0.123 |
| | $\mathrm{lnEXCH_t}$ | 0.44 |
| | $\mathrm{INFL_t}$ | -0.003 |
| | Residual ($\mathrm{lnPROD_t}$) | 0.345 |
| | Cons | -0.319 |

No. of obs = 49; Adjusted R-squared = 0.108
Where *, ** and *** show the significance of the variables at 10%, 5% and 1%, respectively

***Source:*** Author’s analysis based on World Bank Data, 2023

The results in Table 6 indicate that there is no endogeneity problem, supporting that there was no model misspecification error. The test was conducted by running a regression using residuals from the GDP function and the Manufacturing production function in the Manufacturing exports structural model. The coefficients of these residuals were revealed to be statistically insignificant, hence confirming that there was no problem.

Nevertheless, the ARDL estimation approach is also designed to take care of this challenge by allowing additional lags, as was done to obtain results in Table 4.5.

## 5. Conclusion and Recommendation

### 5.1 Conclusion and Policy Recommendation

As Tanzania embarks on reforming its industrial sector for sustainable economic growth and development, the focus on what manufacturing exports can do is important. Previous (one-year lag) manufacturing exports and labour force are significant factors driving manufacturing exports. This means manufacturing exports of past years influence the current performance of exports in the manufacturing sector. To have the best performance in manufacturing exports in the future, the country should critically look at what is happening now in manufacturing exports. Therefore, doing the best to improve manufacturing exports now determines their future performance. From this end, policies to encourage exports from the manufacturing sector are of immediate importance. These include increasing manufacturing exports' production to ensure their constant availability, encouraging quality in manufacturing output produced (by using appropriate technologies) and searching for further markets for manufacturing goods from Tanzania.

In the case of the labour force, efforts to encourage further quality labour are needed. It will ensure that technological transfer is successfully assimilated and absorbed domestically. There should be special consideration for efforts to offer professional skills, general education and on-job training. Staff development programs in various workplaces, being from the public or private sectors, should be necessary and mandatory.

The results support the hypothesis that the labour force positively determines manufacturing exports, but refute the hypotheses that GDP affects manufacturing exports positively, and manufacturing production has a positive impact on manufacturing exports. The significant contribution of the labour force to manufacturing exports in both the short run and long run supports the H-O theorem and its complement by new trade theories for the Tanzanian manufacturing sector that the country should produce and export manufacturing products by using an abundant factor, which is labour.

### 5.2 Contribution of the Paper to Theoretical and Policy Debate

The findings on the approach introduced by this study on the combination of the H-O theorem and its complementation from other insights of new international trade theories, confirm theoretically that the international trade function should include human capital as an important driver, since it turned out to be statistically significant. This fact also supports the applicability of the H-O theorem and its complements by new trade theories in Tanzania since the country is labour-endowed. The paper also concludes that the application of the H-O theorem should be complemented by insights from new international trade theories for it to yield meaningful results and bring policy impact.

This study's contribution resonates with the insights by Rodrik (2016), who emphasised the role of human capital among other key drivers in sustaining growth in Africa. As suggested by Rodrik, exhibition of Tanzania's miracle features should be free from low productivity and weak industrial capacity, which should be achieved through using a comparative advantage in labour-intensive and resource-based industries. The related fact was highlighted by Klinger *et al.* (2023) and Mufuruki *et al.* (2017).

**5.3 Future researchers**

Future research should focus on empirical longitudinal studies examining the impact of recent policy reforms and industrial strategies on export performance would provide valuable insights. To build on Rodrik's insights, future research should explore the interaction between traditional and modern trade theories in shaping Tanzania's manufacturing export patterns. Sector-specific analysis to identify tailored interventions for addressing productivity and competitiveness challenges and investigate the role of regional trade agreements and global value chains in enhancing Tanzania's export potential is also an area that still needs research intervention.

## References

African Economic Outlook (2024). *Tanzania Economic Outlook*. Abidjan, African Development Bank.

Akhtar, M., Hassan, S., Bakhsh, K. & Tabasam, N. (2015). Determinants of manufactured goods exported from Pakistan. *Pakistan Business Review*, 17(2).

Amornkitvikai, Y., Harvie, C. & Charoenrat, T. (2012). Factors affecting the export participation and performance of Thai manufacturing small and medium-sized enterprises (SMEs). *Research Online*, University of Wollongong.

Bank of Tanzania (2016) *Annual report 2015/16*. Dar es Salaam: Bank of Tanzania.

—— (2017) *Annual report 2016/17*. Dar es Salaam: Bank of Tanzania.

—— (2018) *Annual report 2017/18*. Dar es Salaam: Bank of Tanzania.

—— (2023) *Annual report 2022/23*. Dar es Salaam: Bank of Tanzania.

Bournakis, I. (2012). The determinants of exports in the Greek manufacturing sector. *Global Business and Economics Review*, 14(4).

Buturac, G., Mikulić, D. & Palić, P. (2019). Sources of export growth and development of manufacturing industry: Empirical evidence from Croatia. *Economic Research*, 32(1), 101–127.

Davis, D.R., Weinstein, D.E., Bradford, S.C. & Shimpo, K. (1997). Using international and Japanese regional data to determine when the factor abundance theory of trade works. *American Economic Review*, 87(3), 421–446.

East African Community (2017). *EAC industrial competitiveness report: Harnessing the EAC market to drive industrial competitiveness and growth*. Arusha: EAC.

Enders, W. (2003). *Applied econometric time series*. 2nd edn. New York: Wiley.

Epaphra, M. (2016). Determinants of export performance in Tanzania. *Journal of Economics Library*, 3(3).

Hakura, D.S. (1999). *A test of the general validity of the Heckscher-Ohlin theorem for trade in the European Community*. IMF Working Paper No. 99/70. Washington, DC: International Monetary Fund.

Heckscher, E. (1919). The effect of foreign trade on the distribution of income. *Ekonomisk Tidskrift*, 497–512. Reprinted in AEA (1949) *Readings in the theory of international trade*, 272–300. Philadelphia: Blakiston; English translation in Flam, H. and Flanders, M. J. (eds) (1991) *Heckscher–Ohlin trade theory*, 43–69. Cambridge, MA: MIT Press.

Kaakunga, E. K. & Matongela, A. M. (2012). Determinants of manufactured export performance in Namibia. *Journal for Studies in Humanities and Social Sciences*, 1(2). Available at: http://hdl.handle.net/11070/1370 (Accessed: 2 July 2022).

Kabue, S. T., Oloko, M. A. & Muturi, W. (2019). Relationship between strategic response capability and export performance of manufacturing firms in Kenya. *Strategic Journals*, 6(4), 980–991.

Klinger, B., Santos, M., Arroyo, P. & Vashkinskaya, E. (2023). Growth diagnostics and competitiveness study of the manufacturing sector in Tanzania. *African Economic Studies Journal*, 45(2), 101–126.

Kravis, I. B. (1956). Availability and other influences on the commodity composition of trade. *Journal of Political Economy*, 64, 143–155.

Leamer, E. E. (1995). *The Heckscher-Ohlin Model in Theory and Practice*. Princeton Studies in International Finance, No. 77. Princeton, NJ: International Finance Section, Department of Economics, Princeton University.

Marandu, E. (2008). Strategy factors associated with the export performance of manufacturing firms. *Journal of Business in Developing Nations*, *11*.

Ministry of Finance and Planning, United Republic of Tanzania (2021). *National five-year development plan 2021/22–2025/26*. Dar es Salaam: URT.

Ministry of Industry, Trade and Investment, United Republic of Tanzania (2012). *Tanzania Industrial Competitiveness Report*. Dar es Salaam: MITI.

Mpunga, H. S. (2016). Examining the factors affecting export performance for small and medium enterprises (SMEs) in Tanzania. *Journal of Economics and Sustainable Development*, *7*(6).

Mufuruki, A., Mawji, R., Marwa, S. & Kasiga, G. (2017). *Tanzania's industrialisation journey: From an agrarian to an industrialised state in forty years*. Oxford: Oxford University Press.

National Bureau of Statistics, United Republic of Tanzania (2019). *National accounts statistics: Popular version*. Dar es Salaam: NBS.

Niringiye, A. & Tuyiragize, R. (2010). *Determinants of a firm's level of exports: Evidence from manufacturing firms in Uganda*. Nairobi: African Economic Research Consortium (Research Paper 196).

Pradhan, P. J. & Das, K. (2012). Exports by Indian manufacturing SMEs: Regional patterns and determinants. *MPRA Paper* 41804.

Rodrik, D. (2016). An African Growth Miracle? *Journal of African Economies*, *27*(1), 10–27. Available at: https://academic.oup.com/jae/article-abstract/27/1/10/2660399?login=false (Accessed: 12 April 2025)

Romalis, J. (2004). Factor proportions and the structure of commodity trade. *American Economic Review*, *94*(1), 67–97.

Samuelson, P. A. (1949). International factor-price equalisation once again. *The Economic Journal*, *59*(234), 181–197.

—— (1953). Prices of factors and goods in general equilibrium. *Review of Economic Studies*, *21*(1), 1–20.

Sebolao, K., Sekwati, L. & Bakwena, M. (2019). Determinants of export decisions by manufacturing firms in Botswana. *International Journal of Business and Economics Research*, *8*(5), 257–262.

Suresh, K. G. & Aswal, N. (2014). Determinants of India's manufactured exports to South and North: A gravity model analysis. *International Journal of Economics and Financial Issues*, 4(1), 144–151.

TanzaniaInvest (2024). *Tanzania industrial sector*. Available at: https://www.tanzaniainvest.com/industry (Accessed: 12 April 2025).

United Republic of Tanzania (2012). *Five-year development plan 2011/12–2015/16: Unleashing Tanzania's latent growth potentials*. Dar es Salaam: President's Office, Planning Commission.

Uysal, O. & Mohamoud, S. (2018). Determinants of export performance in East African Countries. *In Proceedings of The IIER International Conference*, Warsaw, Poland.

Wang, X. (2013). *The determinants of textile and apparel export performance in Asian countries*. Graduate Theses and Dissertations 13642, Iowa State University. Available at: https://lib.dr.iastate.edu/etd/13642 (Accessed: 15 June 2023).

Wickens, M. (2008). *Macroeconomic theory: A dynamic general equilibrium approach*. Princeton, NJ: Princeton University Press.

World Bank (2023). *World Bank data*. Washington, DC: World Bank.