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Rebuilding Somalia's Manufacturing Industry: Assessing Critical Determinants and Pathways for Economic Development

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ABSTRACT

This empirical study investigates how human capital, infrastructure, and government policies influence prospects for rebuilding manufacturing and enabling economic development in Somalia. A structured survey of 300 professionals examined direct impacts on the manufacturing industry. Analysis revealed human capital and stable governance positively affected economic progress, while infrastructure's effect was insignificant. The paper addresses Somalia's critical need for promoting manufacturing amidst prolonged instability. Findings suggest policy and workforce development strategies for leveraging manufacturing for growth by overcoming binding constraints.

1. INTRODUCTION

The rapid structural transformation of most Asian nations from agrarian-based economies to manufacturing-driven development has been driven by a significant wave of globalization and economic liberalization since the early 1980s. However, the pace of this transition varies among these nations, as shown by differences in GDP growth rates, per capita GDP, food security, and poverty prevalence. The declining percentage of agriculture in these countries' GDP is a defining feature of this shift, which is driven by both structural changes and rising per capita income. This trend is particularly pronounced in Southeast Asian (SEA) countries.

In just over three decades, SEA nations have witnessed a substantial reduction in the percentage of GDP attributed to agriculture. In Vietnam, this share plummeted from 40% to 19%, while the Philippines saw a decline from 24% to 11%. Similarly, Cambodia's agricultural contribution fell from 48% to 33%, Laos from 60% to 27%, and Myanmar from 47% to 36% [1].

Meanwhile, numerous corporations have embarked on extensive global expansion of their manufacturing networks, either through organic growth or strategic acquisitions [2]. A staggering testament to this phenomenon is reflected in the statistics for 2013 alone: foreign affiliates of multinational corporations (MNCs) employed a staggering 71 million individuals, boasting sales of $35 trillion and assets worth $97 trillion [3].

On the other hand, agricultural economic restructuring represents a paradigm shift in the composition of sectors within the agricultural domain. It entails a transition from an agriculture-centric sector towards an allocation that increasingly favors forestry and fishing. The World Bank suggests that this transformation aligns with the broader process of agricultural transition, which holds particular significance in urban areas [4].

Agricultural transition is a phenomenon closely entwined with agricultural economic restructuring, particularly in urbanized, industrialized, and modernized contexts. It catalyzes the growth of agricultural products, precipitating shifts in production, demand, circulation, and employment within the agricultural sector. Concomitantly, it triggers changes in broader socio-economic processes, including urbanization rates, population structure, and income distributions across agricultural sectors [5].

In Africa, a select few nations have already cultivated advanced manufacturing industries, including South Africa, Algeria, Botswana, Gabon, Mauritius, and Namibia. New sectors are beginning to increase in other nations, such as Ethiopia's leather industry and East Africa's pharmaceutical sector. In addition to other projects to support the development of SMEs, several nations, such as Ethiopia, Rwanda, and Morocco, are establishing networks of industrial parks and special economic zones (SEZs). When comparing 2010 to 2019, Ethiopia's manufacturing value-added increased by a factor of four, reaching just under $5 billion [6].

In the early 1970s, the Somali manufacturing industry emerged, which was based mostly on agricultural product processing. In 1986, the central government planned to expand its sugar and milk processing plants, build a new cement factory in Berbera, and hire an Italian company to run its urea facility, which operated at less than 30% capacity. With the help of Italian government funding, a hide-and-skin processing plant was established in Mogadishu in 1989.

Despite this activity, it did not respond as effectively to incentives as agriculture [7]. The production fell by 4.9% in 1988. A drop occurred after a 5% increase in 1987. The government blamed the lack of inputs and spare parts, as well as poor management. Manufacturing had almost disappeared from the economy by 1990, accounting for only about 5% of the GDP. Food processing, simple consumer products, leather and tanning, petroleum refining, and urea manufacturing were all dominated by 23 large plants, most of which were in the public sector. Many companies functioned in the 1970s with the assistance (at a low cost) of Russian professionals, but these were ejected in 1977 when the Soviet Union refused to support Somalia in its battle against Ethiopia. Furthermore, several industries were not economically feasible without heavy import protection, and productivity declined. In the late 1980s, the sector contributed less than 5% of the GDP [8].

Intense conflict, widespread population displacement, food insecurity, humanitarian crises, and the glaring absence of centralized governance systems have characterized Somalia's narrative over the past three decades [9]. The repercussions have been devastating, with the destruction of public goods, including infrastructure and social services, as well as the decimation of the once-promising manufacturing industry. These factors have triggered large-scale population displacements, disrupted food supplies, and led to widespread famine. Consequently, Somali trade has metamorphosed into a predominantly merchandising enterprise heavily reliant on imported goods. However, this transition has brought forth a host of challenges, including the influx of expired and substandard goods, a surge in unemployment, and heightened immigration pressures.

Considering these profound transformations and challenges, a comprehensive examination of the obstacles and opportunities confronting the Somali manufacturing industry is imperative. This research endeavors to address this pressing concern by restructuring Somalia's industrial sector: evaluating key factors and strategies for economic development. By doing so, this study aims to elucidate the extent of its impact, contributing to a nuanced understanding of Somalia's economic landscape and its path towards a resilient and thriving manufacturing industry.

2. LITERATURE REVIEW

2.1 Industrialization (Industrialization and economic development)

The introduction and expansion of industries in a specific location, region, or country is referred to as industrialization [10]. It is a state in which a variety of industries are recognized in different sections of the country. As a country develops its manufacturing, it produces a wide range of goods.

The Industrial Revolution has made industrialization a central aspect of structural changes, resulting in steady increases in production and employment levels, leading to unparalleled wealth development. Therefore, fostering the growth of the industrial sector can play a crucial role in attaining sustainable development. There is a well-established correlation in the growth and development literature between the expansion of manufacturing production and the increase in GDP [11].

Following the industrial revolution in the eighteenth century that brought about rapid growth in many Western countries, many governments regarded industrialization as a panacea for accelerated growth [12]. The researcher perceives the manufacturing industry as the primary catalyst for economic expansion. In the near future, a comprehensive analysis can be provided regarding the industrialization efforts undertaken by several East Asian nations, which have propelled them to achieve remarkable economic growth and earned them the moniker of the Asian Tigers (2021). The process of industrialization plays a crucial role in driving economic growth, leading governments to implement various policies aimed at fostering the development of the industrial sector [13].

In a more comprehensive perspective, industrialization can be defined as the increase of the value contributed by sectors other than agriculture and services to the Gross Domestic Product (GDP). To be more precise, it refers to the augmentation in the value added by the secondary sector. However, it is more common for industrialization to be used interchangeably with the manufacturing industry [14].

From a historical context rooted in an agrarian society, the subsequent stage of progression that can be anticipated is the industrial phase. Nevertheless, it appears that Africa has bypassed the industrial phase and transitioned directly to the service phase. This is generally inconsistent with the developmental trajectory pursued by most Western and Asian countries. The aforementioned phenomenon, commonly referred to as the skip, however, has been contended to have detrimental effects on the region due to its neglect of potential benefits, including technology innovation, policy experimentation, and knowledge acquisition. Furthermore, owing to the substantial dependence on foreign capital for both public and private investment, as well as the enduring deficits in manufacturing imports, employment is generated to support population growth, enhance wages and working conditions, and sustain persistent balance-of-payments deficits [15].

According to the IMF report of 2019, the Somalia conflict that lasted for three decades has delayed the country's growth. However, the manufacturing industry has demonstrated growth and resilience, emerging as a crucial sector in the country's economy.

Before the outbreak of the civil war in 1991, approximately 53 state-owned small, medium, and large manufacturing businesses were encountering difficulties, and many of the remaining industries were subsequently destroyed by the ensuing bloodshed. Nevertheless, several of these small-scale plants have been reopened, and newer ones have been established, primarily as a result of significant local investments made by the Somali diaspora. The latter category encompasses factories involved in the production of pasta, mineral water, confections, plastic bags, fabric, hides and skins, detergent and soap, aluminum, foam mattresses and pillows, fishing boats, carry-out packaging, and stone processing, in addition to approximately 25 factories located in the Mogadishu region [16]. Despite the industry is seeing fast growth, partially driven by the inflow of remittances from the diaspora. The lack of resources, significant security concerns, and non-competitive characteristics have impeded the growth and restricted the expansion of industries nationwide [17]. Moreover, according to the Ministry of Commerce and Industry Report in 2018, the manufacturing sector in Somalia contributes 10% to the GDP, employs 2% of the formal workforce, and accounts for 0.01% of the country's exports. Additionally, in Mogadishu, a total of 33 prominent industrial facilities specialize in the production of various goods including mineral water, plastic bags, foam mattresses

and pillows, detergent and soap, aluminum, stone processing, and fishing boats. This information is based on the official listing provided by the Ministry of Commerce and Industrialization in 2018.

2.2 Assessing critical determinants and pathways for economic development

The elements determining manufacturing transformation have been investigated by most researchers, including Joumard et al. [18], Ford and Despeisse [19], as well as Mehta and Rajan [20]. Additionally, manufacturing change is influenced by politics, quality, and logistical infrastructure, as indicated by Sahoo and Yadav [21]. In this section, an examination was conducted of the four possible critical determinants of industrial transformation: infrastructure, government role, human capital, and economic development.

2.2.1 Infrastructure

In the development of economic growth theory, infrastructure is generally regarded as an endogenous component that enhances economic performance. For instance, in resource-constrained settings, the importance of infrastructure in agricultural development is underscored, as it enables the overcoming of limitations imposed by an unfavorable geographic location and local natural endowment [22]. By making alternate production methods more viable, agricultural production costs and trade expenses can be reduced. However, whether infrastructure can be perceived as a production element or if it impacts agricultural production costs depends on the ease with which infrastructure can be substituted or added, as noted by Christoffersen [23].

In the late 1970s, a total road infrastructure length of 19,380 kilometers, encompassing all categories from paved to gravel and tarmac, existed. According to the African Competitiveness Report from 2015, despite some deterioration in some areas of the nation, the proportion of roads that Somalis paved and maintained during the civil war period is still the same as in Kenya and Ethiopia and significantly higher than in Tanzania. In 1991, the disintegration of the Central Somalia government occurred, leading to the eruption of civil war throughout the country, resulting in the destruction of all forms of infrastructure, including highways, airports, seaports, and power plants. The manufacturing industry relies significantly on infrastructure [24]. Infrastructure has significantly impeded the growth of the Indian planning sector. According to Sridevi and Kumar [25], ongoing infrastructure-related issues like poor road conditions, inadequate connectivity, constrained air, and seaport capacity, and the underdevelopment of transportation modes like railways as well as alternatives like inland water transport and domestic aviation have been persistent sources of concern.

Although Ethiopia possesses the capability to generate sufficient electricity for its current and prospective manufacturing facilities, the country's power distribution system and infrastructure are outdated, thereby limiting the supply of industrial power. Inadequate road networks, insufficient air and seaport facilities, and underdeveloped railway networks all hinder the expansion of this sector. Consequently, product delivery to clients is characterized by delays and inefficiencies [26].

In Somalia, the manufacturing sector boomed prior to the Civil War era, with a total of fifty-three firms of varying sizes operating in the industry. The country had the potential to manufacture a variety of products such as juices, textiles, canned meat, fruits, fish, food items, sugar, alcohol, cosmetics, beverages, and candies, among others. Presently, the present number has significantly diminished in comparison to both historical records and neighboring countries in the region. According to Somalia customs data, there has been a growing importation of capital machinery for manufacturing and raw materials into Somalia during the past three years. This indicates that Somalia's future in manufacturing is promising due to the entrepreneurial tendencies of its society [27].

In prior studies, most research efforts focused on investigating and reporting the challenges confronting the existing industrial sector. In contrast, this study has examined the reestablishment of Somalia's industrial businesses: measuring key drivers and approaches for economic development.

2.2.2 Quality of human capital

Human capital encompasses the knowledge, skills, attitudes, physical abilities, and managerial efforts necessary for the management of capital, technology, and land to produce goods and services for human consumption, among other purposes. Numerous studies have investigated the influence of human capital on the development, productivity, and innovation within the manufacturing industry. However, it is worth noting that certain studies have posited that the role of human capital during the Industrial Revolution was relatively limited [28]. Additionally, there have been studies emphasizing the ineffectiveness of human capital in the manufacturing industry.

As indicated by Adejumo et al. [29], the unorganized manufacturing industry experiences diminished productivity and efficiency, primarily stemming from a substantial workforce composed of low-skilled and less-educated laborers who utilize inferior technology and receive meager wages. This observation underscores that enhancing the human capital base within a state exerts a positive impact primarily within the formal manufacturing industry, given the pronounced demand for skilled labor in that context.

The findings of the survey have unveiled pivotal components of employability skills deemed essential by employers operating in the industrial sector. These skills have been subjected to ranking, revealing that, in the context of the Malaysian manufacturing industry, seven skills are considered crucial: basic skills, thinking skills, sourcing skills, resource skills, system and technology skills, and personal qualities skills. In contrast, informational skills are deemed to hold moderate importance [29].

2.2.3 Government role

The role of the government in industrialization and its connection to political instability has been examined in several studies. In this study, an attempt is made to examine the importance of a stable political environment in the re-establishment of Somalia's industrial sector. The re-establishment of the industrial sector is reliant on good governance. Ekpo [30] discussed various industrial policies and industrialization techniques, such as import substitution, export promotion, and foreign private investment-led industrialization, as well as policy reform measures like the indigenization policy and structural adjustment program. These policies and measures have been devised and implemented. It is worth noting that in Somalia, the manufacturing industry is predominantly based on massive state investment.

According to Ekpo [30], industrial core projects (ICPS) were established by the government. These projects included an iron and steel plant in Ajaokuta, steel rolling mills in Warri, Kaduna, and Oshogbo, an aluminum smelter plant in Ikot Abasi, crude oil refineries in Port Harcourt and Kaduna, and petrochemical and fertilizer factories in Port Harcourt, among others. Initiatives in the paper industry at Oku Iboku, cement industries at Calabar and Nkalagu, a machine tools company, sugar plants, and marble industries were also put into place by the government. Import-substitution industrialization (ISI) policies can also be enacted by the government, exerting pressure on local and foreign firms, particularly Somali importers, to establish local plants. Additionally, the encouragement of exports can be promoted by the government. Nigeria's export-oriented industrial policy aimed to expedite the country's industrial development.

Nigeria's 1989 new industrial policy and debt conversion (equity swap) program, along with the new export promotion policy and incentives, resulted in the abolition of export license requirements for manufactured goods under the new export promotion law. Additionally, export credit guarantees and insurance schemes were introduced, commodity boards were abolished to allow for a more active role of market forces, and export-free zones were established at various locations throughout the country [31]. Political unrest and governance issues were undoubtedly barriers to industrialization. Weak policy execution, poor entrepreneurship, political instability, corrupt government institutions, and a lack of technical know-how have been identified as contributing factors [10, 32]. The positive impact of the policy was observed in the increase in the number of medium- and large-scale industrial plants from 150 at independence to 380 in 1965, as well as the elevation of the manufacturing industry's contribution to GDP from 4.2 percent to 6.1 percent in 1964 [33].

Despite Somalia's little industrial contribution to the GDP, particularly in comparison to the livestock sector, it was substantially more advanced than neighboring countries in terms of development [34]. According to UNIDO [35], Somalia's manufacturing sector contributed 6.3 percent to the country's GDP from 1977 to 1980. Nevertheless, the proportion of GDP experienced a minor decrease to 5.6 percent over the period of 1981-1985. In the mid-80s, there was a decline in the growth rate of manufacturing output, which dropped from 2.4 percent to 2 percent. Additionally, capacity utilization was reduced to 26 percent. This decline can be attributed to a shift in government policy focus from the private sector to the public sector. Before 1991, Somalia had more than 50 state-owned manufacturing companies of various sizes. Mogadishu, the capital city, served as the main industrial hub, hosting bottling plants, factories producing spaghetti, cigarettes, matches, and boats, a petroleum refinery, a small tractor-assembly workshop, and small businesses engaged in the production of construction materials. Kismayo boasted a meat-tinning factory, a tannery, and a state-of-the-art fish factory [36]. Two sugar refineries were located in the vicinity: one near Jilib, situated on the lower section of the Jubba River, and another at Jawhar, positioned on the middle section of the Shabelle River. Nevertheless, with the commencement of the civil war in 1991, the majority of these establishments ceased operations due to the destruction of infrastructure and widespread looting of enterprises, resulting in the complete annihilation of the intellectual and material advancements made in the preceding three decades [37].

3. METHODOLOGY

In this study, a quantitative research approach was employed to investigate the transformation of Somalia's industrial market: Shaping essential factors and channels for economic development. The study centered on three independent variables: infrastructure, government role, and human capital while evaluating the prospects in terms of economic development. The study meticulously compiled a comprehensive database of manufacturing enterprises in Somalia, drawing from industry reports, governmental databases, and business directories. The target population was defined using specific criteria such as geographical location, manufacturing industry, and company size. Systematic random sampling techniques were employed to ensure a representative sample, and outreach efforts via email and telephone were conducted to introduce the study's objectives and request participation. The potential participants were validated against official industry records to enhance sample accuracy.

To mitigate sampling bias, the study implemented stratified sampling, accounting for variations in manufacturing subsectors, and analyzed the database for potential biases. Follow-up strategies, including reminder emails and phone calls, were used to address non-response bias. The sample was stratified to include proportional representation from different manufacturing industries and company size categories, capturing a diverse range of perspectives from both large-scale and small-scale enterprises.

Randomization techniques were utilized within each stratum to ensure an unbiased representation of the final sample. The selected sample underwent validation against official industry statistics and census data, with adjustments made as necessary to align with the overall manufacturing landscape in Somalia. These rigorous sampling procedures were employed to enhance the study's reliability and ensure a robust representation of manufacturing enterprises in Somalia. Previous studies with similar objectives and methodologies have successfully utilized sample sizes in the range of 250 to 350, contributing to the justification for our chosen sample size.

The research conducted a preliminary test using a set of questionnaires distributed to 20 expert participants, comprising economists, industry professionals, and academics. These experts evaluated the questionnaire for relevance and comprehensiveness. Subsequently, the questionnaire was modified based on their feedback to improve its quality and address any identified issues. The research encompassed evaluations for content and construct validity, as well as reliability. In terms of content validity, experts contributed insights into the subject matter of the questionnaire. Construct validity was established through a comparison of the questionnaire results with existing measures, concepts, and theories pertaining to the manufacturing industry and its critical determinants and pathways for economic development. Reliability was assessed through a test of internal consistency using Cronbach's alpha. To ensure the smooth administration of the questionnaire process, participants were carefully selected and provided with clear instructions, allowing sufficient time for completion. Additionally, follow-up and reminders were executed, including sending reminders to non-respondents, to improve the response rate among participants. A total of 350 questionnaires were distributed, of which 203 were correctly filled out, while 147 were either improperly

completed or left incomplete, leading to their exclusion from the subsequent analysis. To measure the participants' perceptions and attitudes, a five-point Likert scale was employed which ranged from 1 (strongly disagree) to 5 (strongly agree) for all variables, including economic development (ED), human capital (HC), government role (GR), and infrastructure (INF).

In terms of data distribution and collection, the study leveraged the convenience and accessibility of online tools, utilizing Google Forms. For the rigorous analysis of the data and the exploration of complex relationships among the variables, advanced statistical techniques were employed, specifically structural equation modeling (PLS-SEM and CB-SEM) conducted through the Smart PLS software.

4. RESULTS AND DISCUSSION

4.1 Demographic analysis

Table 1. Demographic

Questions	Frequency	Present	Cumulative (%)
Gender			
Male	162	79.8	79.8
Female	41	20.2	100
Age			
Under 25	85	41.9	41.9
25-40	110	54.2	54.2
Above 40	8	3.9	100
Marital status			
Married	82	40.4	40.4
Single	121	59.6	100
Qualification			
Diploma	10	4.9	4.9
Bachelor	135	66.5	66.5
Master	58	28.8	100
PHD	0	0	0
Experience			
Less than 5 years	128	63.1	63.1
Between 1-10 years	51	25.1	25.1
Over 10 years	24	11.8	100

Sources: computed by authors (2024)

A total of 41 female participants made up 20.20% of the total, while 162 male participants represented 79.8% of the total. Regarding age distribution, 41.9% of the participants were below 25 years old, 54.2% fell within the 25-40 age range, and 3.90% were above 40. Marital status-wise, 40.4% of the participants were married, and 59.6% were single. In terms of qualifications, 4.90% of the participants held a diploma, 66.5% possessed a bachelor's degree, and 28.8% had attained a master's degree. Concerning work experience, 63.1% of the participants had less than 5 years of experience, 25.1% had between 1 and 10 years of experience, and 11.8% had over 10 years of experience (Table 1).

4.2 Outer model evaluation (Model measurement)

In the pursuit of meticulous data analysis and the examination of intricate interrelations among variables, sophisticated statistical methodologies were deployed, notably incorporating the application of structural equation modeling techniques, including both Partial Least Squares Structural Equation Modeling (PLS-SEM) and Covariance-Based Structural Equation Modeling (CB-SEM). These analyses were executed utilizing the Smart PLS software platform.

Reliability was determined using Alpha Cronbach, factor loadings, composite reliability, and average variance through PLS-SEM and CB-SEM techniques. Factor loadings exceeding 60% were categorized as high, while those less than 40% were considered low [38]. Concerning Alpha Cronbach, reliability values greater than 0.90 were deemed excellent, those greater than 0.80 were considered fine, values exceeding 0.70 were regarded as adequate, those surpassing 0.60 raised doubts, and values less than 0.60 were deemed unsatisfactory [39]. Furthermore, composite reliability and average variance should both be greater than 70% and 50%, respectively. Thus, for the factor loadings to exceed 0.50, the threshold value for this study should have been greater than 0.6.

Table 2. Reliability and assessment

Reliability and Assessment - PLS-SEM				
Constructs	**Factor Loadings**	**Cronbach's alpha**	**Composite Reliability**	**AVE**
Infrastructure		0.711	0.808	0.586
INF1	0.745			
INF2	0.676			
INF3	0.864			
Government Role		0.736	0.85	0.654
GR1	0.788			
GR2	0.816			
GR3	0.821			
Human Capital		0.747	0.84	0.568
HC1	0.683			
HC2	0.768			
HC3	0.803			
CH4	0.755			
Economic Development		0.768	0.843	0.52
ED1	0.688			
ED2	0.780			
ED3	0.827			
ED4	0.811			
ED5	0.720			
Reliability and Assessment - CB-SEM				
Constructs	**Factor Loadings**	**Cronbach's alpha**	**Composite Reliability**	**AVE**
Infrastructure		0.711	0.705	0.544
INF1	0.745			
INF2	0.674			
INF3	0.865			
Government Role		0.664	0.81	0.54
GR1	0.792			
GR2	0.819			
GR3	0.815			
Human Capital		0.747	0.748	0.568
HC1	0.697			
HC2	0.768			
HC3	0.793			
CH4	0.754			
Economic Development		0.761	0.714	0.515
ED1	0.695			
ED2	0.780			
ED3	0.796			
ED4	0.632			
ED5	0.720			

Sources: computed by authors (2024)

Table 2 shows the results, confirming that all items measuring the constructs had factor loadings greater than 0.60.

Moreover, the findings presented in the tables demonstrate that the Alpha Cronbach and composite reliability values exceeded the benchmark of 0.70, indicating good internal consistency for most constructs. However, it is worth noting that the construct "Government Role" obtained a score of 0.664 when assessed using the second method of CB-SEM, as shown in Table 2. While this score falls slightly below the recommended threshold, it is still considered acceptable as it closely approaches the desired level of 0. 70. Additionally, all mixed AVE scores exceeded the cutoff value of 0.50. This evidence supports the conclusion that the measurements of variables are valid and reliable for both PLS-SEM and CB-SEM methods.

Furthermore, the values of the variance inflation factor (VIF) for the constructs of human capital, infrastructure, government role, and economic development are all less than 10 (1.00), indicating that the PLS outer model used does not suffer from multicollinearity issues. Moreover, Table 3 presents the results of the HTMT-Matrix, which was conducted to assess discriminant validity after processing the data using PLS. According to the recommendation by Henseler et al. [40], if the HTMT value is less than or equal to 0.90, discriminant validity between two constructs has been established. Since the value of each construct in the HTMT matrix is less than 0.90, it can be asserted that all variables in the study are fully valid and reliable. Furthermore, the study instrument meets the Fornell-Larcker criterion for the validity test, as shown in Tables 3 and 4.

Table 3. HTMT matrix

HTMT Matrix- PLS-SEM				
EO	EO	GR	HC	INF
GR	0.466			
HC	0.32	0.484		
INF	0.301	0.276	0.291	
HTMT Matrix- CB-SEM				
EO	EO	GR	HC	INF
GR	0.433			
HC	0.450	0.331		
INF	0.339	0.400	0.301	

Sources: computed by authors (2024)

Table 4. Fornell-Larcker criterion-

Fornell-Larcker Criterion- PLS-SEM				
Construct	EO	GR	HC	INF
EO	0.606			
GR	0.306	0.614		
HC	0.377		0.657	
INF	0.046			0.744
Fornell-Larcker criterion- CB-SEM				
Construct	EO	GR	HC	INF
EO	0.754			
GR	0.36	0.721		
HC	0.239	0.36	0.809	
INF	0.246	0.244	0.226	0.765

Sources: computed by authors (2024)

Inner model evaluation (structural model)

The meticulous analysis of data and exploration of complex relationships among variables involved the use of advanced statistical methods. Specifically, structural equation modeling techniques, such as PLS-SEM and CB-SEM, were employed. These analyses were conducted using the Smart PLS software platform.

Common method assessment

If the Variance Inflation Factors (VIFs) within the inner model, as determined through a comprehensive collinearity assessment, are equal to or below 3.3, it indicates that the model is devoid of common method bias [41]. Hence, all VIF values of this model are below 3.3 as indicated in Table 5, thus, the common method bias is generally avoided, and the model results in acceptable levels of collinearity.

Table 5. Common method assessment

Collinearity Statistics (VIF)- PLS-SEM			
Method	Inner variable	Result	Decision
VIF	Government Role (GR)	1.089	Acceptable
VIF	Human Capital (HC)	1.084	Acceptable
VIF	Infrastructure (INF)	1.116	Acceptable
Collinearity statistics (VIF)- CB-SEM			
Method	Inner variable	Result	Decision
VIF	Government Role (GR)	1.096	Acceptable
VIF	Human Capital (HC)	1.064	Acceptable
VIF	Infrastructure (INF)	1.109	Acceptable

Sources: computed by authors (2024)

Table 6. Regression (R-square)

Variable	R-square	R-square Adjusted
Economic Development	0.221	0.209

Sources: computed by authors (2024)

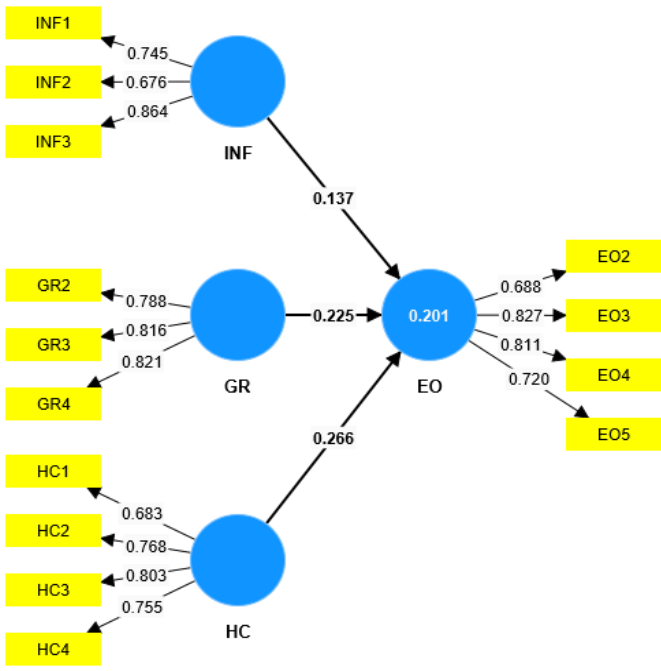

Figure 1. Structural model
Sources: computed by authors (2024)

Evaluating the inner model in this study involved two main aspects. Firstly, the tables mentioned earlier were utilized to assess the quality of the proposed model, particularly regarding its reliability and validity. Secondly, another part was dedicated to testing the model's goodness or fitness. It is crucial to evaluate the model's capacity to elucidate and

forecast the relationships between constructs, and this was achieved through the examination of R-square values.

Table 6 reveals that economic development has an R-square of 0.221 and an adjusted R-square of 0.209. The R-square value indicates weak predictive accuracy, as it is less than 0.50. However, it is noteworthy that Figure 1 demonstrates that every single path leads to a confidence level exceeding 95%. Consequently, it can be argued that the model, to a sufficient extent, can predict its dependent variables with accuracy.

4.3 Evaluation of research hypotheses

Table 7 provides a compelling quantitative analysis of the relationship between various constructs and economic development. Each construct is evaluated based on standard deviation, T statistics, P values, and a corresponding decision regarding the hypothesis's support. The constructs in question are 'Human Capital -> Economic Development', 'Government Role -> Economic Development', and 'Infrastructure -> Economic Development'. This analysis leverages standard deviation to assess data variability, T statistics for hypothesis testing, and P values for inferential statistical significance.

Firstly, examining the 'Human Capital -> Economic Development' construct, the standard deviation (STDEV) of 0.098 is moderately low, indicating a relatively tight clustering of data points around the mean. The T statistic 2.723 is notably above the conventional threshold of 2 for statistical significance in many social sciences studies, implying a robust deviation from the null hypothesis. The P value of 0.006, well below the typical alpha level of 0.05, reinforces the statistical significance of this finding. The decision to support the hypothesis aligns with the quantifiable evidence suggesting a significant positive correlation between human capital and economic development with similar researchers such as Wirajing et al. [42] and Li et al. [43]. This conclusion is consistent with the economic theory that emphasizes the role of human capital in driving economic growth through increased productivity and innovation.

In the second construct, 'Government Role -> Economic Development', the findings are similarly supportive but with nuanced differences. The STDEV is slightly higher at 0.099, implying a marginally more significant data spread. The T statistic, while slightly lower at 2.714, remains comfortably above the threshold for deeming a result statistically significant. The P value of 0.007, although higher than the human capital construct, is still well below the 0.05 cut-off, affirming the hypothesis's support with similar researchers [44], These results underscore the significance of government intervention in stimulating or regulating economic development, aligning with theories that acknowledge the government's multifaceted role in shaping economic environments.

Conversely, the 'Infrastructure -> Economic Development' construct presents a contrasting scenario. The STDEV is lower at 0.078, suggesting less variability in the data set. However, the T statistic of 1.492 falls below the threshold for statistical significance, indicating that the observed effect needs to be sufficiently strong to reject the null hypothesis confidently. This is further corroborated by a P value of 0.136, which exceeds the conventional alpha level. As a result, the hypothesis is rejected. This outcome suggests that within the context of this study, infrastructure may not have a statistically significant direct impact on economic development. These findings challenge specific economic development models that heavily weigh physical infrastructure, suggesting the need for a more nuanced understanding of the role of infrastructure in the broader economic context.

Table 7. Direct effect

Constructs	Standard Deviation (STDEV)	T statistics (|O/STDEV|)	P values	Decision
Human Capital -> Economic Development	0.098	2.723	0.006	Supported
Government Role -> Economic Development	0.099	2.714	0.007	Supported
Infrastructure -> Economic Development	0.078	1.492	0.136	Rejected

Sources: computed by authors (2024)

5. CONCLUSION AND IMPLICATIONS

5.1 Conclusion and contribution

The research centered on analyzing the critical determinants and pathways for Economic Development in the Rebuilding of Somalia's Manufacturing Industry, employing diverse indicators such as human capital, infrastructure, and government involvement. Moreover, the study sought to appraise the outlook for manufacturing by gauging its influence on economic development. In light of the earlier findings and discussions, the subsequent conclusions can be drawn: The initial hypothesis posits the identification of a notable impact of human capital on economic development. The second research hypothesis underscores the significant influence of the government's role on economic development. The third hypothesis suggests that infrastructure does not play a significant role in affecting economic development. This study offers unique practical insights into leveraging manufacturing for Somalia’s growth agenda by unpacking industry perspectives on salient constraints—human capital, infrastructure, and institutions. Findings advocate workforce skill development alongside reforms strengthening policy and governance for unlocking manufacturing potential. By highlighting areas for strategic government action, results aim to inform initiatives for catalyzing industrialization. However, analysis is limited without discussing sustainability. Further research should also incorporate firm capabilities and consumer demand factors to extend an understanding of revitalizing manufacturing. Overall, the paper signifies an inaugural attempt to address a noteworthy knowledge gap regarding binding constraints facing Somalia's manufacturing.

5.2 Limitations and recommendations

The research exclusively relied on quantitative data collected through a structured questionnaire, which, in future studies, could be complemented by the inclusion of qualitative data. Furthermore, employing a larger sample size exceeding the current count of 350 participants may lead to more generalizable and robust results. Future research endeavors should consider incorporating qualitative data collection

methods to provide a more comprehensive perspective on the challenges and prospects within the manufacturing industry. Researchers can explore a mixed-methods approach that combines both quantitative and qualitative data. Future research could delve deeper into each of the variables by exploring subcategories or specific aspects within them. Within the "human capital" variable, researchers could investigate the impact of different types of training programs or educational levels on economic development. For the "government role," research could focus on specific policies or regulatory frameworks that influence the manufacturing industry. Similarly, within "infrastructure," future studies could examine the role of specific infrastructure elements like transportation networks or digital connectivity.

Moreover, the study offers the following recommendations:

- Prioritize educational and vocational training programs to enhance the skills and capabilities of the workforce.
- Encourage partnerships between the government, educational institutions, and industries to ensure alignment with industry needs.
- Develop and implement supportive policies, such as tax incentives, subsidies, and regulatory reforms, to attract and retain manufacturing investments.
- Facilitate public-private partnerships to foster collaboration and shared responsibility for industry growth.
- Prioritize projects that directly impact the manufacturing industry, such as industrial zones and specialized infrastructure for key industries.
- Ensure the maintenance and sustainability of infrastructure to support long-term industry development.
- Encourage research and development initiatives to foster innovation within the manufacturing industry.
- Establish technology hubs and innovation centers to facilitate collaboration between academia, research institutions, and industry players.
- Develop financial mechanisms and support systems to ease access to capital for small and medium-sized enterprises (SMEs) in the manufacturing industry.
- Collaborate with financial institutions to create tailored financing solutions for manufacturers, including favorable interest rates and flexible repayment terms.
- Actively participate in regional and international trade agreements to expand market access for Somali manufactured goods.
- Facilitate partnerships with foreign investors, industry experts, and technology providers to bring in expertise and capital for industry development.
- Promote the export-oriented growth of the manufacturing industry through targeted marketing and promotional activities.

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