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Impact of Disaggregated Industries' Exports on Economic Growth in China

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ABSTRACT

This research analyzes the influence of agricultural, manufacturing, and service exports on China's economic progress in both the short-term and long-term. The findings demonstrate that while every one of the export sectors positively influence development, manufacturing exports possess the most substantial long-term effect, underscoring the significance of industrialization and technical advancement. Agricultural exports, although advantageous, have a comparatively little impact due to minimal value creation and price instability, but the growing importance of service exports indicates China's fundamental shift towards a knowledge-based economy. The substantial error correcting mechanism indicates that China's economy rapidly adapts to discrepancies from equilibrium. Policy proposals include bolstering industrial competitiveness, fostering service sector growth, augmenting agriculture value addition, and sustaining trade openness. These results underscore the necessity for diversified exports, innovation-fueled growth, and economic resilience, therefore securing China's enduring worldwide economic supremacy and future prosperity.

Introduction

China is renowned for its multifaceted and swiftly expanding economy, with industrial value-added serving as a pivotal factor in evaluating the success of various sectors within the nation. Despite China's substantial industrialization and urbanization, the primary sector continues to contribute to the overall industrial growth. The sectors of agriculture, forestry, and fisheries play a significant role in the acquisition of natural resources and the cultivation of food. Nevertheless, the proportionate impact of the primary sector on China's total industrial growth has diminished

throughout the years. China's agricultural practices include the development of staple crops such as rice, wheat, and vegetables. Furthermore, the primary sector is augmented by the inclusion of forestry and fishing activities. China is well recognized for its strong manufacturing sector, which has significantly increased industrial value (The Global Economy, 2022). The nation serves as a prominent worldwide center for manufacturing, including the production of diverse commodities like electronics, textiles, vehicles, and heavy equipment. The industrial growth in China's secondary sector is intricately connected to its manufacturing prowess. Manufacturing items for local use and export has substantially contributed to the country's economic growth. China has undergone a significant transition towards a more service-based economy. The tertiary sector, including retail, banking, healthcare, and technological services, has seen growing significance in contributing to industrial growth. The expansion of e-commerce, financial services, and technology-driven businesses has significantly facilitated China's growth trajectory.

China's primary industrial exports include a diverse range of agricultural goods, including fruits, vegetables, and processed meals. In addition, it engages in the exportation of unprocessed resources, such as minerals and metals acquired via mining operations. Although China is generally a net exporter in the primary sector, some agricultural items might have to be imported due to insufficient local production. The imports may include certain agricultural products or processed food items to fulfill domestic demand or to provide diversity. China's export profile is mainly dominated by its secondary industries. The country engages in the exportation of a diverse array of manufactured products, including electronics, machinery, textiles, clothes, and consumer goods. The secondary sector of China's economy, namely the manufacturing sector, has significant influence in the realm of international commerce. China's industrial growth in this area exemplifies its position as the global manufacturing hub and a major exporter of finished products. China may engage in the importation of raw materials, intermediate products, and innovative technology in order to bolster its manufacturing endeavors inside the secondary sector. The integration of imported technology and machines serves to augment the value contributed throughout the manufacturing process. The tertiary sector in China makes a substantial contribution to exports, particularly via services like information technology, financial services, and tourism, which play a crucial role. E-commerce platforms and technological services are integral in generating export income for the tertiary industry. The tertiary sector has the ability to bring in specific services such as technology licensing, financial services, and professional skills via trade. China's exports are mostly comprised of products. Still, the country's tertiary sector, especially in services, is starting to play an integral part in its economy as it shifts towards a more service-oriented system. China's trade dynamics exemplify its status as a dominant global economic force, characterized by a wide array of exports across primary, secondary, and tertiary sectors. The contribution of industrial expansion in each sector is essential in determining China's trade balance and economic evolution. The existing research proposes to observe the substantial and reassuring impression of disaggregated industries' exports on economic spreading out in China.

Review of Literature

Anderson and Ponnusamy (2023) elaborated that the structural transformation is far from agriculture because trade costs are usually high and lead to a recognition of the non-tradable sector. However, in the evidence of a large panel of economies from 1995 to 2018, the findings indicate deagriculturalization towards economic growth, sectoral shares of GDP, employment, and as well as exports in the long term. However, agriculture's share of economic growth is high and recognizable towards exports. Agriculture advancement and economic growth are interlinked and have great significance, while it should be on a sustainable track when environmental effects also mean a lot. Regarding this fact, Raihan (2023) elaborated that agricultural growth is a sustainable

factor for the environment as well as for economic growth in Vietnam from 1984 to 2020, evidenced by autoregressive distributed lag model, vector error correction, fully modified least squares, dynamic ordinary least squares, and canonical cointegrating regression in the short and long periods. Cheong and Wu (2014) and Wu (2015) revealed that the manufacturing industry is noteworthy for economic growth, while heavy industry is not satisfactory for benefiting output growth. However, the fact behind the exceptional value of the manufacturing sector added to China's economic growth is the initiation of economic reforms. Since the economic reforms, the value addition from China's high manufacturing industry towards economic growth has been incredible. It is also evident that the technological based manufacturing exports has enhanced the economic progress of China. Further, in the discussion of manufacturing industry growth, Gabriel and de Santana Ribeiro (2019) believed that the manufacturing industry is renowned as an engine of growth for evolving economies. According to the researcher, the growth to the manufacturing industry is the more substantial driver that motivates the economic growth of developing countries. Gabriel and de Santana Ribeiro (2019) applied different techniques to large samples, such as Panel Vector Autoregression (PVAR), impulse-response functions (IRF), and forecast-error variance decomposition (FEVD) for a large sample of 115 economies from 1990 to 2011. Moreover, the Hirschman-Rasmussen (HR) Index for 29 economies for the base years of 1995, 2000, 2005, and 2010 and groups of economies during 1995 and 2010. However, among different industrial sectors or industrial growth as a whole, the manufacturing sector or manufacturing growth is termed the engine of growth in these emerging nations.

Park and Shin (2012) and Zhang (2014) argued that the development and reforms in the industrial sector have enhanced the efficiency of the service sector among Asian economies, becoming the new engine of mainly developing Asian economies. In the evidence of twelve Asian developing economies, service sector growth is substantial for their economic progress. In contrast, some economies, such as Korea and Thailand, struggle to improve their service sector efficiency and add value to their economic growth. Further, in the case of China, it is evident that the service sector remains lagging behind or slow in economic growth compared to economies of equal scale of development and growth. However, recent evidence shows that the service sector in China has emerged and become the dominant contributor to China's economic growth and job formation. However, the new underdeveloped service sector structure is expected to be more profound, contribute more to economic growth, and balance China's economy, which is more indulged in manufacturing and export (Wu, 2015; Gabriel *et al.*, 2020). The comparison between the two leading economies is evident, and it was found that China is more indulged in the manufacturing sector. At the same time, Russia is more efficient in the services sector. In the comparison, evidence of China with a more vigorous and resource-efficient economy Russia, Zhao and Tang (2018) revealed that China's economic growth was found more significant than Russia from 1996 to 2008 following industrial growth to China's economic growth. However, in the case of China, it is evident that the advancement level of technology is significant enough and enhances the capability of the high-tech industry in China. In some other evidences of Tu *et al.* (2023) and Jin *et al.* (2023), it is evident that the technological based manufacturing and services exports are satisfactory for industrial production and output, as well as contributing to economic expansion in China.

Data, Description and Methods

This portion of data, description and methodologies reflects disaggregated exports including agricultural exports, services exports, and manufacturing exports to stimulus China's economic progress. Rendering to this purpose of estimation, the facts are generated from World

Development Indicators (2023) during 1980 to 2020. However, the description of variable is as follows: dependent variable is taken as economic progress as per capita of growth in annual percent. At the same time, the independent indicators are agriculture, services and manufacturing which are measured in merchandise exports percentage.

Following to the above estimation purposes, the functional formed equation of linear model of China is equated down as follows:

$$EGR = f\,(AGX, MFX, SRX) \qquad (1)$$

Following the equation 1 equated above, economic progress (EGR) is the function of independent indicators such as agriculture exports (AGX), services exports (SRX), and manufacturing exports (MFX) in China.

The above equated functional form is the critical step to measure the linear impact of disaggregated industrial exports as agricultural, manufacturing and services on economic progress of China following linear ARDL. Although, this purpose of the study which can be achieved following linear ARDL is based on short and long periods of span. At the same time, the long term investigation requires initial step of bound testing in which cointegration among exports indicators should be validated.Following these steps, the equation of linear and time series ARDL during long run in China is equated down as follows:

$$EGR_t = \beta_0 + \beta_1 AGX_t + \beta_2 MFX_t + \beta_3 SRX_t + \varepsilon_t \qquad (2)$$

This above equated equation 2 is based on the β's for linear long term effects of agriculture, manufacturing and services exports on China's economic progress level (EGR). Simultaneously, error term to reduce the unobserved error in the long run is indicated by ε.

Moving from long term estimation, the short term effects are equated below including error correction term as associated underneath:

$$\Delta EGR_t = \alpha_0 + \sum_{i=1}^{k} \alpha_1 \Delta EGR_{t-1} + \sum_{i=0}^{k} \alpha_2 \Delta AGX_{t-1} + \sum_{i=0}^{k} \alpha_3 \Delta MFX_{t-1} + \sum_{i=1}^{k} \alpha_4 \Delta SRX_{t-1} + \beta_1 EGR_{t-1} + \beta_2 AGR_{t-1} + \beta_3 MFX_{t-1} + \beta_4 SRX_{t-1} + \varepsilon_t \qquad (3)$$

The short term equation 3 which is equated above illustrates the impressions of α's as short term and β's as long term. However, this equation included conservative correction term to hinder the unobserved error aroused from short to long span.

Results and Explanation

The existing portion of results and explanation converses the linear findings based on the impressions of disaggregated term exports including agricultural, services and manufacturing on China's economic achievements. For linear estimation, traditional and orthodox approach of ARDL is applied to examine the impressions of disaggregated exports in the short and long periods. Therefore, the initial estimation has been taken place from statistical estimation which includes statistical based descriptive summary and correlation matrix. Further, the study moved on bound cointegration and short-long periods ARDL estimations. Rendering this, table 4.1 of statistical summary illustrates that China's model has mean values and median points. However, the concerned indicators have significant minimum and maximum values and standard deviations

have shown the significant differences from their mean points, indicating overall efficiency of the China's model and suggesting for auxiliary assessment.

Table 4.1: Statistical-based Descriptive Summary

	EGR	AGX	MFX	SRX
Mean	8.266506	1.517807	78.66329	18.88815
Median	8.124498	0.557166	88.27526	18.58614
Maximum	13.69002	5.906929	94.30033	36.03503
Minimum	1.996619	0.000000	26.43050	5.911612
Std. Dev.	2.839477	1.698971	20.08929	8.295402

Table 4.2: Correlation Matrix

	EGR	AGX	MFX	SRX
EGR	1			
AGX	0.20860	1		
MFX	0.33508	0.55961	1	
SRX	0.23790	-0.52253	0.79755	1

Table 4.2 illustrates the findings of correlation matrix to quantify the degree of relationship in the midst of interested indicators of the study. The outcomes indicate that AGX and SRX has weak and positive association with EGR. At the same time, MFX has moderate and impactful positive correlation with EGR. The outcomes of this displayed matrix has not identified the problem of multicollinearity in the empirical model of China. Table 4.3 of bound estimates indicates that F-statistic value is 7.565 which is significant at one percent and greater than lower and upper bounds. This indicates that the variables are cointegrated with eachothers and suggests long term presence surrounded by China's pragmatic model.

Table 4.3: Summary of Bound Estimates

			Lower-bound	Upper-bound
F-statistic	7.565	**5%**	2.260	3.480
K	3	**1%**	3.070	4.440

Note: Null Hypothesis: No relationship which is specified by Pesaran et al. (2001)

Table 4.4: Long and Short term Estimates of ARDL

Dependent Variable: D(EGR)				
Short-Run Estimates				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
EGR(-1)*	-0.698233	0.150105	-4.651632	0.0001
D(AGX)	1.012695	0.371896	2.723063	0.0104
D(AGX(-1))	0.199675	0.295354	0.676054	0.5039
DMFX(-1))	0.063574	0.023985	2.650562	0.0124
D(SRX(-1))	0.234225	0.083878	2.792461	0.0088
ECM(t-1)	-0.788233	0.134480	-5.861339	0.0000
Long-Run Estimates				
AGX	0.152159	0.056966	2.671053	0.0118
MFX	0.335454	0.097471	3.441591	0.0016

SRX	0.091049	0.033839	2.690658	0.0112

Note: Significance levels at 5 and 10 percent indicated by ** and *, while at 1 percent by ***.

The estimation results of table 4.4 demonstrate relationships in both the short run and long run across the dependent factor, D(EGR), and its explicating variables. In the short run, the lagged value of EGR (-1) exhibits a significant negative coefficient of -0.6982 (p = 0.0001), indicating a robust tendency for EGR to revert to its equilibrium over time. The initial difference of agricultural exports demonstrates a positive and statistically significant impact (1.0127, p = 0.0104), indicating that an increase in agricultural exports promotes short-term economic growth. The lagged initial distinction of AGX(-1) is statistically unimportant (p = 0.5039), suggesting that its effect fails to last over time. The lagged initial distinction of MFX(-1) (manufacturing exports) is significant and favorable (0.0636, p = 0.0124), indicating a delayed yet modest short-run effect of manufacturing exports on economic expansion. In a similar vein, SRX(-1) (service exports) exhibits a positive and significant short-run effect (0.2342, p = 0.0088), underscoring the importance of the services sector in facilitating short-term economic growth. Approximately 78.8% of the departures from the long-run equilibrium are rectified each period, according to the very significant and negative error correction term (ECM t-1) of -0.7882 (p = 0.0000). This suggests a rapid speed of adjustment, indicating that economic growth swiftly reverts to its equilibrium trajectory following disturbances.

The long-run estimates underscore the crucial contribution of exports to China's economic growth, thereby reinforcing the nation's export-led development strategy. AGX (0.1522, p = 0.0118) indicates that agricultural exports exert a positive yet comparatively modest influence on long-term growth. Agriculture significantly contributed to China's initial economic reforms; however, its long-term impact on GDP is constrained by minimal value addition, fluctuating prices, and the country's shift towards commercialization. Agricultural exports help promote rural revitalization, job opportunities, and foreign exchange revenues, therefore contributing to overall economic wellness. The primary long-term motorist is MFX (0.3355, p = 0.0016), indicating the crucial importance of manufacturing exports in China's ongoing economic growth. In recent decades, China has cultivated a competitive industrial sector, leveraging a skilled labor force, robust infrastructure, and tactical trade initiatives. The switch from economical manufacturing to more sophisticated industrial production has enhanced its standing in global markets. The manufacturing sector promotes technological advancement, economies of magnitude, and productivity enhancement, which are essential for sustained expansion of the economy. Furthermore, the increasing worldwide appetite for extremely valuable manufactured goods contributes to enhanced economic resilience and ongoing expansion in countries with robust industrial bases, such as China.

In a similar vein, SRX (0.0910, p = 0.0112) demonstrates a positive and significant correlation, underscoring the increasing relevance of the service industry sector within China's economy. Based on expertise industries, monetary services, e-commerce, and competent markets have progressively expanded, resulting in a greater contribution to GDP. The services sector enhances employment, boosts consumer spending, and fosters innovation, thereby bolstering the manufacturing industry. As economies mature, there is a typical shift towards services, indicating boosted demand from domestic consumers and deeper integration into an international marketplace. The findings are consistent with China's historical growth pattern, characterized by export-driven the industrial revolution and an ongoing shift to high-value manufacturing and services, which have supported endured extended economic progress. The substantial adjustment for error term (-0.7882, p = 0.0000) indicates that China's economy quickly adapts to external

shocks while sustaining long-run equilibrium. The findings support the notion that China's long-term growth strategy must persist in prioritizing industrial upgrading, expanding the service sector, and enhancing global economic integration to maintain economic supremacy and the durability moving forward.

Conclusion and Recommendations

This study's results underscore the vital significance of export dynamics in propelling China's economic development in both the short and long term. In the near term, agricultural exports (AGX), manufacturing exports (MFX), and service exports (SRX) have a favorable impact on economic growth, but their impacts differ in importance and extent. The error correction mechanism (ECM) is notably substantial and negative, signifying a rapid adjustment towards equilibrium in response to aberrations. Ultimately, manufacturing exports serve as the primary catalyst for development, highlighting the significance of industrialization, value-added output, and technical innovation. Agricultural exports contribute to economic growth; but, their effect is limited by poor productivity, price instability, and restricted value addition. The growing significance of service exports indicates China's structural shift towards a more diversified and knowledge-based economy, consistent with economic theories like the export-led growth hypothesis, which highlight industrial expansion and technological advancement as essential factors for sustained growth.

In light of these results, many policy proposals are suggested to enhance China's economic trajectory. Enhancing industrial competitiveness is crucial for sustaining China's global export dominance. Achieving this requires investment in research and development (R&D), automation, advanced manufacturing, and workforce enhancement, which will promote productivity growth and secure long-term competitiveness. Moreover, broadening manufacturing exports across several industries and markets can alleviate external demand volatility and diminish dependence on certain sectors. Secondly, enhancing agricultural production and value addition is essential to optimize the advantages of agricultural exports. Policies must prioritize the modernization of agricultural technology, the adoption of ecologically sound farming methods, and the augmentation of agricultural commodities processing to boost value generation. Investing in agricultural technology breakthroughs and supply chain optimization may facilitate the integration of agriculture into higher-value world economies. Moreover, advancing the service sector is essential as China evolves into a more sophisticated economy. Promoting technology adoption, investing in human resources, and establishing legislative frameworks that support the globalization of service businesses will enhance this sector. Furthermore, cultivating synergies involving services and manufacturing may enhance overall economic effectiveness, as high-value services like banking, logistics, and digital commerce progressively bolster industrial output. Preserving trade accessibility and economic cooperation is essential for ensuring sustained long-term prosperity. China need to persist in fortifying global trade alliances, diminishing trade impediments, and promoting cross-border investments, while also penetrating developing countries to diversify trade connections and alleviate external vulnerabilities.

Ensuring a stable economy and reforming the economy is crucial, since external shocks, trade conflicts, and global economic uncertainty might affect China's development trajectory. An equitable strategy that fosters local consumption, mitigates overdependence on exports, and strengthens economic resilience would facilitate sustainable development. The substantial error correction term in the research indicates that China's economy is very cognizant of deviations, allowing prompt policy measures to restore equilibrium growth. This research confirms the crucial significance of exports in China's economic growth, highlighting the need for industrial

enhancement, service sector development, and modernizing agriculture to ensure sustained long-term progress. To maintain competitiveness in the changing worldwide economy, China must emphasize creativity and diversifying its economy, and improved global trade integration. By implementing measures that bolster manufacturing, improve service-oriented sectors, and reform agriculture, China can secure enduring economic dominance and stability over the long haul.

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