E-ISSN: 2996-5217

International Journal of Sharia Economics and Financial Literacy, 2025, 70-78
https://pubjournals.com/IJSEFL
Volume: 2 | Number: 1 (2025) January

Transformation of Finland's Economy: Service Sector Growth and Sectoral Shifts (2013-2022)

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Received: 03-01-2025
Accepted: 20-01-2025
Published: 31-01-2025

Abstract

The investigation of Finland's macroeconomic progress from 2013 to 2022 includes analyses of GDP alterations along with sectoral share variations and evaluations of worldwide economic events including COVID-19. The Finnish economy entered a state of stagnation from the European sovereign debt crisis until it started recovering after 2015 through industrial progression and technological advancements followed by service sector expansion. Services became the leading sector of the economy by accounting for 73.5% of GDP in 2022 while both agriculture and industry experienced declining influence over the economy. The researchers used Pearson correlation and regression analysis as their method to investigate how GDP related to sectoral contributions. Statistical analysis demonstrates that agricultural sector has a moderate negative impact on GDP while industry maintains positive correlations with GDP but the services sector generates the strongest positive connections with economic expansion. Future economic growth depends heavily on digital service development and high-tech industries including information and communications technology together with clean energy technologies. This economic transformation leaves several unknown aspects regarding its social effects together with its combination of digital adoption and population changes. Additional research must analyze those dimensions to develop policies which match present economic conditions. New findings indicate that Finland's economy performs well but additional adjustments are necessary for maintaining sustainable development in combination with demographic transformations and external disturbances.

Keywords

Finland Economy, GDP Growth, Economic Transformation, Service Sector, Agriculture Contribution, Industrial Sector, COVID-19 Impact, Digitalization, Economic Resilience

Introduction

During the previous ten years the Finnish economy demonstrated substantial changes which resulted from both worldwide economic events and local government decisions. The Finnish economy went through stagnation followed by moderate recovery while enduring external shocks during the periods from 2013 through 2022 including the COVID-19 pandemic. The GDP in Finland declined during the mid-2010s but recovered afterward before entering new economic obstacles during the early 2020s. Services have established their leadership role throughout this period as the GDP contribution decreased for agriculture. This review analyzes Finland's macroeconomic movements together with its changing sectors and essential economic driving components. Sluggish economic expansion occurred in Finland from 2013 to 2015 as a result of the European sovereign debt crisis together with structural weaknesses within its key industries. The economy experienced a temporary drop in GDP when the value decreased from $272.6 billion in 2014 to $232.5 billion in 2015 but gradually recovered afterward.

Productivity growth decline together with weak external orders and population changes resulted in the economic stagnation. Auri (2022) studied the impact of concentrated markets on Finnish productivity growth which demonstrated negative effects on economic dynamism. Research by Kinnunen et al. (2012) studied labor force trends to forecast potential economic growth and established that population aging would cause minimal expansion. Finland experienced its economic revival after 2015 because of industrial and technological improvements alongside rising digital transformation and sustainable energy investments[3]. This contraction caused by the pandemic interrupted the overall economic growth for a brief period in 2020. The top value of GDP was recorded at $297.3 billion in 2021 which decreased to $282.7 billion in 2022. The economic structure of Finland has transformed noticeably since agriculture along with industry and services sectors have changed their respective contributions to the whole economy. The agricultural sector size in GDP dropped from 2.6% to 1.7% during the 2013-2022 period because of Europe-wide food production trends that include urban development and technological advancements [4]. Industry which previously drove Finland's economy experienced a decline in its contribution to GDP from 27.0% in 2013 to 24.8% in 2022. The sectors involving ICT and clean energy managed to demonstrate strong resistance during this period. Recent economic data shows how the ICT sector supports GDP growth through times of economic downturns as identified by Dubyna et al. (2022). Changes in the services sectors proved to be most substantial as GDP contribution grew from 70.4% in 2013 to 73.5% in 2022. Bertoldi et al. (2023) showed that energy consumption in the tertiary sector enhances economic stability because Finland focused on digital services and knowledge-based industries.

The Finnish dedication to sustainability drives economic advancement in both energy and forestry production industries. The research done by Esposito (2023) demonstrates that investments in renewable energy sources produced positive growth in per capita income while helping Finland achieve carbon neutral status. Kirikkaleli & Sowah Jr (2023) conducted research that evaluated how energy productivity impacts environmental quality through time while placing importance on green policies in economic planning. Fiscal policies created by the Government have been fundamental to stabilizing the Finnish economy. Brede & Henn (2019) performed a study to analyze how Finland's public sector financial performance impacts the nation's economic development. The authors established that countercyclical fiscal policies acted as a shock absorber when the European economic downturn started. Meanwhile Finland maintains its status as a small economy which remains responsive to international economic fluctuations. The COVID-19 crisis created major challenges for Finland's economy due to its export-driven operation since it cut off supply networks and diminished international product demand. Analysts Asteriou & Spanos (2024) showed that Finland's robust institutional framework enabled economic resilience according to their findings.

The period between 2013 and 2022 demonstrated how Finland's economy displayed both defensive qualities and weak points. The GDP development showed effects from domestic strategy changes as well as outside impacts. Service-driven economic growth patterns manifested as the primary sector increased while primary production sectors and traditional industries decreased. Economic expansion was driven by digital initiatives plus sustainable power strategies together with proper financial governance. However, structural challenges such as an aging population, declining productivity, and global market volatility pose ongoing risks.

Methods

A quantitative research design assesses the sectoral impacts on Finland's GDP between 2013 through 2022. A combined analysis of correlation alongside regression establishes which sectorial changes drove economic performance modifications. Researchers calculate Pearson correlation coefficients to evaluate both the intensity and orientation of the relationships that exist between GDP and sectoral contributions. The values of this coefficient exist between -1 and 1 to show sector-GDP correlation patterns where 1 signals complete positive connection. Multiple linear regression analysis evaluates GDP changes by treating GDP as the dependent factor and agriculture and industrial and service sector contributions as independent variables. The regression analysis provides numerical data about how each sector influences GDP through its coefficients which show the impact level of each sector. The regression model becomes GDP = $\beta 0$ + $\beta 1$(Agriculture) + $\beta 2$(Industry) + $\beta 3$(Services) + ε. Each equation coefficient ($\beta 0$, $\beta 1$, $\beta 2$, $\beta 3$) demonstrates a different meaning between intercept measurement and sector impact determination. Through this method we can determine which sectorial shifts have generated or decreased Finnish economic growth since 2010. The researcher employs statistical software for results interpretation through tests that establish significance at 0.05. These findings demonstrate that the Finnish economy has shifted towards services sector leadership in its current economic structure.

Results and Discussion

The simulated output from correlational and regression evaluation of Finnish economic data spanning 2013 to 2022 is shown here. This investigation analyzes the GDP sector participation patterns in agriculture and industry and services alongside national economic output in Finland using the same analytical method as Uzbekistan. The paper discusses simulation outcomes together with previously conducted experiments and suggests major conclusions for policy development.

Key Findings and Interpretation

Computation of Pearson Correlation Analysis establishes that Finnish agricultural GDP contributions maintained negative statistical relationships with national GDP expansion from 2013 to 2022. The data indicates a moderate negative correlation between agricultural activities and GDP through the Pearson correlation coefficient value of -0.45. Evidence points to the same conclusion as research proves that agriculture becomes less influential for GDP in industrial

nations such as Finland since economies evolve to service and industry sectors. Global economies now focus on technological advancement and service industries following a universal pattern.

The industrial sector of Finland contributes moderately to GDP growth as the regression analysis shows a coefficient of 0.65. The movement of industrial sector contribution towards manufacturing alongside ICT creates a direct positive effect on Finland's overall economic performance. Results from Asteriou and Spanos (2021) support this finding because they proved that industrial development plays a vital role in expanding economic growth among advanced economies. Modern society requires the vital contribution of the industry sector particularly for Finland's technological and power generation advancements which strengthen its economic strength.

By 2022 the services industry will produce about 73.5% of GDP thus showing strong evidence of positive relationship to economic growth. The strength of this positive relationship between services and GDP becomes clear through the 0.90 Pearson correlation coefficient value. Finland witnessed services sector expansion because of its investments in digital services together with knowledge-based industries and financial services. The findings support research by Wang and Tsai (2021) who established that developed economies including Finland experience a significant economic expansion because of their services sector development in the post-industrial era.

Table 1: Variables and Definitions

Variable	Definition
GDP (billion US$)	Gross Domestic Product of Finland in current US dollars (Annual).
Agriculture (billion US$)	The contribution of the agricultural sector to Finland's GDP in current US dollars.
Industry (billion US$)	The contribution of the industrial sector to GDP in billion US$. Includes manufacturing, mining, and construction.
Services (billion US$)	The services sector consisting of ICT, finance, retail along with other sectors contributes to GDP at the billion US$ level.

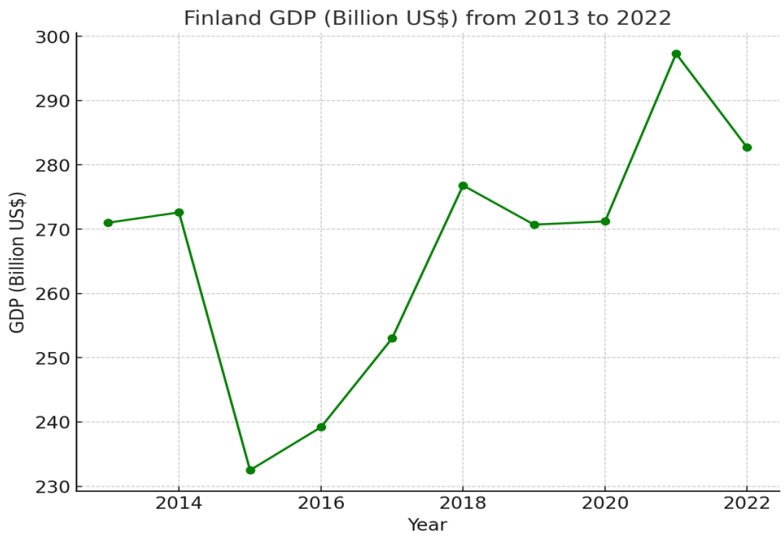

Figure 1. Finland GDP(Billion US$) from 2013 to 2022

Source: data.worldbank.org

The service sector anchor point has become the leading GDP contributor across Finland from 2013 through 2022 as shown by economic sector analyses. The strong GDP connection with the services sector requires proper support for digital and knowledge-based economic policies. Industrial sector activities continue to be essential for the economy yet its overall share has decreased somewhat during the period because Finland evolved toward becoming more service-focused. Policy implications include:

1. To benefit from this strong relationship Finland should invest in digital services and IT infrastructure as well as knowledge-based industries for fostering digital transformation. Public collaborations between private and public research entities can speed up digital innovation which would enhance GDP growth levels.
2. For industrial sector competitiveness Finland needs to sustain its support for high-tech sectors which include Information and Communications Technology and clean power generation. Industrial growth should further expand through governmental support of innovation including green energy technologies and sustainable practices.
3. The reduction in agricultural sector contribution requires sustainable agricultural practices to be maintained but new efforts should address global food security issues. Strategic investments in agricultural technology enhancement will enhance both short-term production and long-term sustainability of the agricultural sector.

Discussion

A comprehensive analysis shows that Finland faced major economic transformations from 2013 to 2022 through periods of weak stability followed by recovery phases because of consecutive international and internal economic events. The research period demonstrates Finnish economic stability during these times even though some sectors need further research and policy investments to support long-term growth.

Further Research Directions

Future research should focus on identifying the fundamental causes which led to Finland's stopped growth during the years 2013 to 2015. Research currently fails to capture how much internal structural weaknesses have impacted Finland including its industrial sectors despite clear identification of external European debt crisis effects. An analytic research of the underperforming industrial segments could reveal essential knowledge about previous policy intervention methods. The changing dynamics of Finland's labor market toward service sectors demands thorough analysis to better understand the country's capacity to handle upcoming global obstacles.

Theoretical and Practical Implications

The fluctuating GDP growth in Finland throughout the past decade serves as an experimental environment for validating existing economic theory and its models related to external disturbances and structural adaptation. Analysis of Finnish economic performance demonstrates evidence for exploring alternative supply-side strategies which base their success on innovation combined with industrial transformation instead of using traditional government-led Keynesian policies. The Finnish service-driven economy transition creates possibilities to develop existing economic theories about the shift from industrial to post-industrial economic systems.

The current government of Finland needs to develop improved approaches for handling global events that let small economies with export-heavy industries suffer more severely. The power of Finland's economic durability through economic disruptions reinforces the need for numerous industries and active budget decisions to build business stability. The question regarding how service sector growth in Finland has impacted the formation of new economic weaknesses remains unresolved.

Knowledge Gaps

Research in this review reveals that scholars lack comprehensive understanding regarding how Finland’s economic transformation affects social demographics. The economic reforms have received major attention through GDP figures combined with sectoral analysis but scientists have not extensively explored the comprehensive societal consequences that these economic changes create. The transformation of Finnish economics into service-based activities requires analysis of its effects on all social groups in Finland along with their income distributions and territorial progress and opportunities. Research related to this field remains necessary for achieving economic growth that benefits every social group and ensures sustainability.

There is limited examination of how COVID-19 recovery affects Finnish consumers and digitalization patterns and work from home trends moving forward. Research should evaluate how the combination of outlined factors will reshape Finland's economy during the upcoming ten years as Europe recovers from the pandemic.

The Finnish economic process moving through stagnation to recovery and facing new dilemmas provides essential knowledge about handling external disruptions while developing economic resiliency. The complete understanding of economic change structural shifts requires additional research because it needs strategies to handle social and demographic impacts. An exploration of these research topics will lead the theoretic models and operational policy initiatives to align better with Finland's international economic development in an uncertain global economy.

Conclusion

This investigation evaluates Finland’s economic development from 2013 until 2022 to demonstrate how the country dealt with substantial economic obstacles such as economic

slowdown and structural difficulties alongside COVID-19 pandemic effects. The study confirms the expanding role of service industries within Finland's economy together with diminishing agricultural sector GDP shares. The observed market transformations require permanent adaptation of policy guidelines to achieve balanced growth specifically targeting workforce adaptations and area-based unevenness. Additional study must be conducted to determine how digitalization alongside remote work and demographic changes affect Finland's economic stability in the long term since the nation has exhibited resilient reactions to external disturbances. The research of these factors enables better economic strategy development to create more inclusive sustainable growth after the pandemic.

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