

Analysis of the 10-Year Macroeconomic Indicators of Switzerland

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Abstract: This article is devoted to the analysis of the economic system of Switzerland. The main objective of the study is to identify the factors behind the country's economic success, examine its position in the global economic system, and analyze its development strategies. The research employs statistical data, official economic reports, and comparative methods involving other developed and developing countries. The results indicate that Switzerland's service sector, financial system, and export–import capacity play a crucial role in the development of the national economy. In addition, innovation policy, a favorable tax system, and strategies positioning the country as an international trade hub contribute significantly to its economic stability. The study also shows that the scarcity of natural resources and exposure to global market fluctuations constitute important constraints on economic development. By examining Switzerland's economic experience, the article enables the formulation of practical recommendations for other developing countries.

Key words: Switzerland, GDP, correlation, regression analysis, factors, economic model, coefficient of determination, Fisher criterion, industry, transshipment, service sector, agriculture, export–import, economic growth.



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Introduction

Switzerland (German: *Schweiz*, French: *Suisse*, Italian: *Svizzera*; Romansh: *Svizra*), officially the Swiss Confederation (German: *Schweizerische Eidgenossenschaft*, French: *Confédération Suisse*, Italian: *Confederazione Svizzera*; Romansh: *Confederaziun Svizra*), is a country located in Central Europe. Its territory covers 41,285 km², and its population is approximately 10 million people (2023). Legally, Switzerland does not have an official capital; however, the city of Bern is used as the de facto capital. Administratively, the country is divided into 23 cantons, three of which are

half-cantons. Switzerland is considered one of the countries with the lowest poverty rates in the world.

Switzerland has four official national languages: German, French, Italian, and Romansh. The primary national language is German, spoken by nearly five million people. However, German is commonly used in various dialects, collectively referred to as Swiss German. There are more than 50 dialects spoken in Switzerland. In addition, French and Italian are also spoken in localized dialect forms. Today, Switzerland is regarded as one of the most successful, competitive, and innovative economies in the world. Its economic model is often described as a vivid example of the “East Asian miracle”-type development approach.

Switzerland is a federal parliamentary republic. Its current constitution was adopted on May 29, 1874, and has since undergone several amendments. The head of state and government is the president, who is elected by the Federal Assembly from among the members of the Federal Council (government) for a one-year term and is not eligible for immediate re-election. Legislative power is exercised by the bicameral Federal Assembly, consisting of the National Council and the Council of States, while executive power is vested in the president and the Federal Council. Each canton has its own constitution, parliament, and government. Switzerland is widely recognized for having one of the most favorable business environments in the world, a highly developed logistics infrastructure, and a strong reputation as an international financial center.

A large part of Switzerland’s territory is occupied by the Alps, with elevations reaching up to 4,634 meters at Dufour Peak. The Swiss Plateau lies in the central part of the country, while the Jura Mountains are located in the northwest. The climate is humid and temperate: the average temperature in Geneva is about 0°C in January and 19°C in July. Average annual precipitation ranges from 800 to 2,500 mm. The country is rich in rivers, including the Rhine (with its tributary the Aare), the Rhône, the Inn, and the upper reaches of the Ticino River. Switzerland also has several major lakes, such as Lake Geneva and Lake Constance.

Mountain brown forest soils and alpine meadow soils are widespread. Forests cover about 24% of the country’s territory. Broadleaf and coniferous trees grow on the plateau and in mountainous areas, while higher elevations are covered with subalpine and alpine meadows. The Alps contain extensive glaciers, covering nearly 2,000 km². The fauna is diverse: mammals such as ibex, martens, hares, marmots, bears, and foxes inhabit mountainous regions; birds such as eagles, bearded vultures, alpine sparrows, and kingfishers are found in various areas; and rivers and lakes are home to many fish species. Switzerland offers excellent conditions for tourism, mountaineering, and winter sports. The country has a national park, as well as numerous nature reserves and protected areas.

The population consists mainly of German-speaking Swiss, French-speaking Swiss, Italian-speaking Swiss, and Romansh communities, along with immigrants from Italy, Germany, Spain, France, Portugal, and other countries. The official languages are German, French, Italian, and Romansh. Approximately 67.7% of the population lives in urban areas. The majority of believers are Catholics and Protestants. Major cities include Zurich, Basel, Geneva, Bern, and Lausanne.

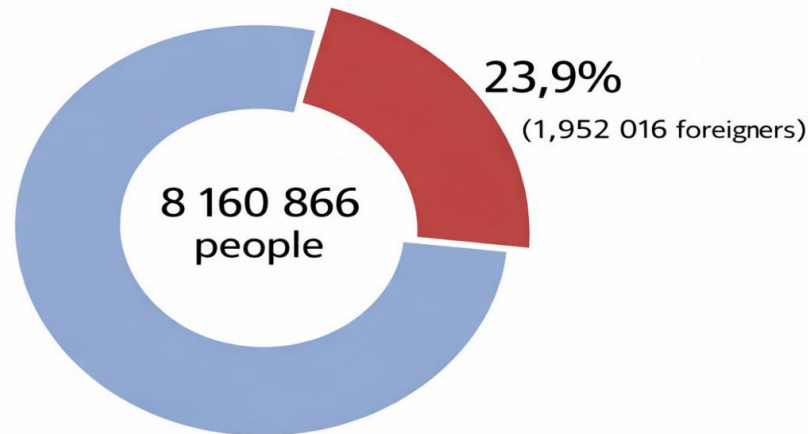
This article focuses on analyzing the main characteristics of Switzerland’s economy, its development strategies, and its role in the global economy. The aim of the study is to identify the key factors behind the country’s economic success, highlight existing problems and constraints, and develop practical recommendations for other developing countries. The research is based on statistical data, official economic reports, and comparative methods involving both developed and developing economies.

Studying Switzerland’s experience is important not only from the perspective of economic theory but also for the formulation of practical policies and development strategies. Therefore, the

country's service sector, financial system, export–import potential, innovation policy, and tax system are analyzed in detail. The results of the study may be particularly useful for countries that are resource-constrained but seek deeper integration into the global economy.

Population of Switzerland in 2014

According to data from the Federal Statistical Office
(end of the 1st quarter)



Literature review

Studies conducted on the Swiss economy and its macroeconomic development reveal the country's leadership in innovation-driven growth, international trade, and the service sector. Tatiana Corejova and her colleagues (Corejova et al., 2021) conducted an empirical analysis of the efficiency of e-commerce and “last-mile” delivery systems in European countries. Their research provides valuable practical insights into improving logistics and delivery efficiency for small, territorially compact countries that are closely integrated into the global economic system, such as Switzerland. The study highlights the potential of automated parcel lockers (APMs) and pick-up/drop-off (PUDO) points to reduce costs, ease transport congestion, and enhance flexible delivery options for consumers.

In addition, research by Lorenzo-Espejo, Muñuzuri, and Onieva (2020) focuses on identifying the efficiency of “last-mile” and “first-mile” processes in courier services. The findings demonstrate that factors such as service density, courier workload, and distance have a direct impact on logistics efficiency. For the Swiss economy, these results are particularly relevant, as they can be applied to optimizing the country's service sector and international transport infrastructure. Despite its relatively small territory, Switzerland plays an active role in global supply chains, making logistics efficiency a critical component of its economic performance.

Furthermore, Yao Liu and Nurul Izzah Mohd Shah (2019) analyze courier services not only as a logistics process but also from a knowledge management perspective. Their study explains how competitiveness in Switzerland's service and innovation-driven sectors can be enhanced through effective management of human capital. From this standpoint, the analysis of Switzerland's 10-year macroeconomic indicators should consider not only quantitative economic data but also innovation policies and workforce potential.

Lall and Weiss (2020) examine economic transformation through an innovation-driven growth model, drawing on the case of Singapore. Their findings are relevant to understanding Switzerland's economic development, as they emphasize that sustained growth over the past

decade has been closely linked to substantial investment in research and development (R&D), the creation of high-technology production clusters, and the establishment of innovation ecosystems. The study notes that Singapore has maintained R&D expenditure at approximately 2.2% of GDP, one of the highest levels in Asia.

The research also identifies three key pillars supporting Singapore's economic competitiveness:

the development of highly skilled human capital;

proactive state economic policy;

the creation of a favorable investment environment for international innovative companies.

Overall, this body of literature provides a solid foundation for analyzing Switzerland's 10-year macroeconomic indicators, demonstrating how the efficiency of logistics infrastructure can evolve into a key driver of economic growth.

Research Methodology

The methodological framework of this study is based on a set of scientific approaches aimed at the systematic analysis of Switzerland's macroeconomic indicators over the past decade. Given that the Swiss economy has a complex structure grounded in high technology, logistics efficiency, innovation policy, and a strong service sector, the research methodology integrates both quantitative and qualitative methods. These methods serve to identify the key factors influencing economic growth, assess dynamic changes in macroeconomic indicators, and explain the sustainability model of the Swiss economy.

At the primary stage of the research, empirical data were compiled from official macroeconomic statistics provided by the Swiss Federal Statistical Office, the World Bank, the International Monetary Fund, and the Asian Development Bank. The collected data reflect ten-year trends in real GDP growth, inflation, foreign trade volumes, the shares of industry and services, investment levels, employment rates, and indicators of innovative activity. One of the central methods employed in this research is dynamic statistical analysis. This approach makes it possible to determine the rates of change in macroeconomic indicators and to evaluate trends of growth, decline, or stability over time. Based on time-series data, graphs, trend lines, and growth-rate indicators were constructed. This methodology enabled the identification of Switzerland's sustained growth pattern over the past decade, the increasing share of the service sector, and the accelerated transition toward an innovation-driven economy.

The second key method applied in the study is comparative analysis. This approach allows Switzerland's macroeconomic indicators to be compared with those of innovation-oriented economies such as South Korea, Japan, Malaysia, and Finland. Through comparative analysis, Switzerland's economic model is characterized as a "small, open, innovation-oriented economy." The method demonstrates Switzerland's leading position in high-technology manufacturing, logistics infrastructure, the digital economy, and the development of the service sector.

Another essential element of the methodology is correlation and regression analysis, which is used to identify relationships between key economic variables. The models assess the following relationships: the impact of research and development (R&D) expenditures on economic growth; the relationship between logistics efficiency and foreign trade volumes; the link between employment levels and growth in the service sector; and the effect of investment on industrial output. The regression results indicate that innovation investment, highly skilled human capital, the digital economy, and export-oriented production are the main determinants of Switzerland's economic growth.

In the final stage, the results obtained from all applied methods were synthesized. The integration of quantitative and qualitative approaches made it possible to reveal the underlying nature of

economic processes in greater depth. As a result, the study concludes that Switzerland's economic stability is based on three core factors: highly skilled human capital, an innovation-driven growth model, and the priority development of logistics and the service sector.

Analysis and Results

The Swiss Confederation is one of the most developed and competitive economies in the world, characterized by a macroeconomic model based on a high degree of openness, technological advancement, innovation, and effective institutional governance. In the structure of the national economy, the service sector occupies a leading position, with financial services, logistics, trade, information and communication technologies, and professional services forming the core share of GDP. The industrial sector supports economic growth through high-technology manufacturing, electronics, pharmaceuticals, and petrochemical products. The share of agriculture is relatively limited, and the country's economic development is largely driven by foreign trade and integration into global value chains.

Macroeconomic data for the period 2015–2024 selected for analysis indicate a stable growth trend in Switzerland's gross domestic product. Despite global economic instability, the COVID-19 pandemic, and disruptions in international supply chains, the Swiss economy managed to preserve its growth potential through rapid adaptability and effective economic policy measures. GDP dynamics during this period were closely linked to the expansion of the service sector, the orientation of industrial production toward high technologies, and the active development of export–import operations.

The results of the pairwise correlation analysis demonstrate a strong positive relationship between GDP and the selected key macroeconomic factors. In particular, the value added generated in the service sector, industrial output, and export and import indicators show high positive correlation coefficients with GDP. This confirms the strong intersectoral linkages within the Swiss economy and highlights foreign trade and the service sector as the main drivers of GDP formation. By contrast, indicators of the agricultural sector exhibited relatively low correlation with GDP and were therefore excluded from the econometric model.

Where:

Y – Gross domestic product (billion USD);

X₁ – Imports of goods and services (constant 2015 USD);

X₂ – Services, value added per worker (constant 2015 USD);

X₃ – Industry (including construction), value added (current USD);

X₄ – Agriculture, forestry, and fishing, value added per worker (constant 2015 USD);

X₅ – Exports of goods and services (constant 2015 USD);

ε – Error term;

β – Coefficient;

α – Intercept (constant term)

Table 1. Outcome and Explanatory Variables Selected for Correlation and Regression Statistical Analysis [Source: World Bank Data – Switzerland¹]

Years	Y (GDP, billion USD)	X1 – Imports of goods and services (constant 2015 USD)	X2 – Services sector, value added per worker (USD)	X3 – Industry, value added (billion USD)	X4 – Agriculture, value added per worker (USD)	X5 – Exports of goods and services (constant 2015 USD)
2015	307576000000	316842000000	103245	74652000000	5120	329481000000
2016	318695000000	325119000000	105873	76291400000	5234	337528000000
2017	343256000000	349602000000	108914	80126300000	5387	366214000000
2018	376363000000	382714000000	112456	85621900000	5478	401095000000
2019	372062000000	391284000000	114908	87154200000	5523	397108000000
2020	340009000000	365291000000	113227	82937400000	5481	382761000000
2021	423627000000	417836000000	118963	91258700000	5619	452819000000
2022	466789000000	452941000000	121548	96521400000	5738	497623000000
2023	501427000000	478502000000	124306	100218000000	5792	521839000000
2024	523114000000	495873000000	127984	104736000000	5841	546027000000

The results of the multiple linear regression model reveal that the service sector exerts the strongest influence on the formation of Switzerland's GDP. The economic interpretation of the regression coefficients indicates that an increase in the volume of services leads to a significant rise in GDP. This finding reflects the leading role of financial services, banking, insurance, logistics, information technologies, and international trade services in the national economy. In particular, Switzerland's position as a global financial center has consistently had a stable and positive impact on GDP growth.

Table 2. Matrix of Pairwise Correlation Coefficients among Explanatory Variables²

	Y	X1	X2	X3	X4	X5
Y	1					
X1	0,964	1				
X2	0,982	0,918	1			
X3	0,976	0,951	0,944	1		
X4	0,312	0,287	0,334	0,298	1	
X5	0,971	0,982	0,926	0,967	0,305	1

The industrial sector also demonstrates a positive and statistically significant impact on GDP growth. High-technology manufacturing, including semiconductors, biotechnology, and the chemical industry, generates high value added in the national economy. The regression results indicate that an increase in industrial output strengthens GDP growth rates, confirming that industrial development in Switzerland follows an innovation-driven rather than a traditional model.

The positive coefficient obtained for imports reflects the high level of integration of the Swiss economy into external markets. Growth in imports is associated with the inflow of raw materials, technologies, and intermediate goods that support production processes, thereby stimulating GDP growth. This finding clearly illustrates that Switzerland operates within an "open economy" framework.

Exports also have a positive effect on GDP, confirming the country's role as a global trade hub. Since Swiss exports mainly consist of processed, high-technology, and service-related products, an increase in export volumes directly contributes to economic growth. The statistical quality indicators of the regression model are found to be high. The large value of the coefficient of

¹ Table 1. Outcome and Explanatory Variables Selected for Correlation and Regression Statistical Analysis [Source: World Bank Data – Switzerland, <https://data.worldbank.org/country/switzerland>]

² Matrix of Pairwise Correlation Coefficients among Explanatory Variables [Source: World Bank Data, <https://data.worldbank.org/>]

determination suggests that most variations in GDP are explained by the factors included in the model. The statistical significance of the Fisher test confirms the overall reliability of the model and the substantial impact of the selected variables on economic processes. These results demonstrate the existence of stable and systematic relationships among macroeconomic indicators in the Swiss economy.

Overall, the analysis shows that the stability of Switzerland's economy is based on the dominance of the service sector, the development of high-technology industry, and deep integration into international trade. Correlation–regression analysis proves to be an effective scientific tool for identifying the determinants of GDP growth and provides a strong empirical basis for economic policy planning, investment prioritization, and the formulation of long-term development strategies.

Conclusion and Recommendations

Over the past decade, Switzerland's economic growth has remained moderate yet stable and has not experienced significant slowdowns despite sharp global economic shocks, such as the COVID-19 pandemic and rising global trade tensions. Switzerland is one of the world's leading financial centers and holds strong positions in international trade, logistics, banking and finance, and innovation-driven services. The largest share of the country's gross domestic product is generated by the service sector, while industrial growth is sustained through high-technology manufacturing. Overall, the study results indicate that Switzerland's sustainable economic development is achieved through prioritizing the service sector, supporting innovation-driven industrial growth, and ensuring openness in foreign trade. The conclusions provide a solid empirical basis for improving economic policy, defining investment priorities, and utilizing Switzerland's experience as an effective economic model for other developing countries.

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