INTERNATIONAL RESERVE CURRENCIES AND THE FUTURE OF THE CHINESE YUAN[1] [2]

Kafkas University
Economics and Administrative
Sciences Faculty
KAUJEASF
Vol. 14, Issue 28, 2023
ISSN: 1309 – 4289
E – ISSN: 2149-9136

Article Submission Date: 11.10.2023 *Accepted Date: 11.12.2023*

Ayvaz BARTİK
Dr.
Atatürk University
Institue of Social Sciences,
Erzurum, Türkiye
ayvazbartik@gmail.com
ORCID ID: 0000-0003-2856-5137

Kerem KARABULUT
Prof. Dr.
Atatürk University
Faculty of Economics and
Administrative Sciences,
Erzurum, Türkiye
kerem@atauni.edu.tr
ORCID ID: 0000-0002-3159-3289

ABSTRACT | The purpose of this study is to explore has the possibility of the Chinese Yuan to becoming a dominant currency among countries with reserve currencies. The study examines GDP (world share), the share of total reserves in a country's GDP, and the Consumer Price Index (CPI). Only countries that possess reserve currencies were analyzed. In this study, an Artificial Neural Network (ANN) prediction model was employed. According to the study results, it is estimated that Chinese Yuan meets the specified criteria and has the potential to become a strong currency in the future. Additionally, the study predicts that the United States will maintain its status as a strong reserve currency in the future but could lose its strength based on the specified criteria. Germany and the United Kingdom are expected to perform weakly according to the specified criteria.

Keywords: *Reserve currency, Yuan, Artificial Neural Networks*
JEL Codes: *E4, E42, C45*

Scope: *Economics*
Type: *Research*

DOI: 10.36543/kauiibfd.2023.033

Cite this article: Bartik, A. & Karabulut, K. (2023). International reserve currencies and the future of the Chinese Yuan. *KAUJEASF, 14*(28), 812-846.

[1] Compliance with the ethical rules of the relevant study has been declared.
[2] This study is derived from the doctoral thesis titled International Reserve Currencies and the Chinese Yuan written by Ayvaz BARTİK under the supervision of Prof. Dr. Kerem KARABULUT.

ULUSLARARASI REZERV PARALAR VE ÇİN YUANIN GELECEĞİ

Kafkas Üniversitesi
İktisadi ve İdari Bilimler
Fakültesi
KAÜİİBFD
Cilt, 14, Sayı 28, 2023
ISSN: 1309 – 4289
E – ISSN: 2149-9136

Makale Gönderim Tarihi: 11.10.2023 *Yayına Kabul Tarihi: 11.12.2023*

Ayvaz BARTİK
Dr.
Atatürk Üniversitesi
Sosyal Bilimler Enstitüsü,
Erzurum, Türkiye
ayvazbartik@gmail.com
ORCID ID: 0000-0003-2856-5137

Kerem KARABULUT
Prof.Dr.
Atatürk Üniversitesi
İktisadi ve İdari Bilimler Fakültesi,
Erzurum, Türkiye
kerem@atauni.edu.tr
ORCID ID: 0000-0002-3159-3289

ÖZ | Bu çalışmanın amacı, rezerv paraya sahip ülkeler içinde Çin Yuan'ının gelecekte güçlü bir para birimi olma potansiyelini araştırmaktır. Çalışma için kullanılan GSYH (dünya payı), toplam rezervlerin ülke GSYH içindeki payları ve TÜFE değişkeni rezerv para kriterleri içerisinden seçilmiştir. Araştırma kapsamında analiz edilen ülkeler resmi olarak rezerv paraya sahiptirler. Çalışmada, Yapay Sinir Ağları (YSA) tahmin modeli kullanılmıştır. Çalışma sonuçlarına göre, Çin Yuan'ının belirlenen kriterleri karşıladığı ve gelecekte güçlü bir para olma potansiyeli taşıdığı tahmin edilmiştir. Ayrıca çalışmada, ABD'nin gelecekte güçlü bir rezerv para olarak varlığını sürdüreceği, ancak bu gücünü belirlenen kriterlere göre kaybedebileceği öngörülmektedir. Almanya ve İngiltere'nin belirlenen kriterlerde zayıf kalacağı tahmin edilmiştir.

Anahtar Kelimeler: *Rezerv para birimi, Yuan, Yapay Sinir Ağları*
JEL Kodları*: E4, E42, C45*

Alan: *İktisat*
Türü: *Araştırma*

1. INTRODUCTION

Reserve currencies are assets held in the vaults of money markets and central banks, conmprising of gold and foreign exchange. The foreign exchange reserves held by bank iclude a range of foreign assets, such as foreign currency bonds, treasury bonds, and other foreign holdings. Central banks hold reserve currencies in international markets is to meet foreign exchange needs and fulfill essential external requirements (Tatlıyer, 2019, p. 12).

A reserve currency is defined as a currency that money markets can control, easily convert into other currencies, and is widely accepted as the primary means of payment in international trade. Reserve currency pertains to foreign currency assets (that can be easily converted Pound, Dollar, Euro, Yen, Chinese Yuan), and more internationally acknowledged gold, the IMF's SDR (Special Drawing Rights), and IMF reserve options (TCMB, 2019, p. 1).

These currencies are employed for balancing payments, stabilizing prices, and as liquid assets. The utilization of reserve currency in payments has led to it possessing the feature of being a medium of exchange. Additionally, the currency's interventionist quality has been accentuated by its trading practices amongst banks. The use of the currency as a reserve in commercial transactions serves as evidence that it serves as an anchor (Krugman, 1984, p. 263). In order for a currency to attain global utility, it must fulfill specific criteria:

- ✓ **Financial Development:** Is one of the necessary prerequistes for a currency to attain reserve currency that the financial markets in the country should have a deep and flexible structure.
- ✓ **Macroeconomic Stability:** It is important for a reserve currency that the significant factors influencing a country or region's system are controlled in a balanced and stable manner.
- ✓ **Convertibility:** A reserve currency should be easily convertible into other currencies.
- ✓ **International Acceptance:** A reserve currency should be widely accepted as the primary means of payment in international trade and settlements.
- ✓ **Reliability and Low Inflation:** A currency gaining the status of a reserve currency should have low inflation and implement a reliable monetary policy.
- ✓ **Size and Economic Power:** For a currency to become a reserve currency, the country's economic size, GDP value, and its share in world trade should be substantial.
- ✓ **Free Exchange Rates and Open Capital:** If a country has a freely foating exchange rate, its currency's supply and demand determined according to market conditions. A free exchange rate regime allows

> currency exchange rates to fluctuate in line with market conditions. Open capital movements mean that capital movements can be freely conducted without restrictions, facilitating foreign investors and businesses to acquire assets and invest across national borders (Prasad, 2017, p. 158).

The liberalisation of the capital account in nation eliminates restrictions within the country's current balance of payments. In the country's current balance of payments, it includes foreign direct investments, portfolio movements, and the debts of banks from abroad. It is possible to control all these accounts with an open capital policy. The liberalisation of the capital account in country enables it to integrate into the global economic arena. In countries where the capital account is open, the policy should be based on solid foundations to prevent sudden capital outflows (Kose & Prasad, 2020, p. 12).

The macroeconomic policies implemented by a country encompass both monetary and fiscal policies aimed at achieving economic balance within the country. Monetary policy aims to uphold low inflation rates, attain full employment, and ensure financial stability. Conversely, fiscal policy endeavors to promote price stability, high employment levels, and overall economic growth within a nation (Özyılmaz, 2016, p. 28). At the macroeconomic level, development is synonymous with favorable growth. Macroeconomic stability encompasses elements such as low inflation, low interest rates, the balanced and stable use of fiscal policy tools, the competitiveness of the exchange rate, and the achievement of a balanced balance of payments (Fischer, 1993, p. 4).

The level of financial development required to be reserve currency includes a financial sector where transaction costs are minimal, and market entry and exit are unrestricted. In a country, having broad, deep, and flexible markets constitutes the prerequisites for an efficient functioning financial sector. Market breadth implies that the spread between buying and selling prices should be narrow. Market depth, on the other hand, is explained as the market's ability to expand into broad areas without affecting personal assets. The consept of flexibility describes the market's ability to react quickly to any adverse circumstances that may arise in the buying and selling of goods and services (Cohen, 2019, p. 16).

In addition to all of these, for a currency to become a reserve currency, it has been stated that the country issuing the currency should have a high share in the world GDP, a significant role in global trade, and its currency should be used in international payments. Furthermore, in order to possess a reserve currncy, it is important for a country to meet legal, social, and political factors and reach the standards of an advanced country's economy.

The advantages of a country's currency being a reserve currency are as follows:

- **Seigniorage İncome:** Seigniorage income is defined as the difference between the cost of a currency and its face value. A country with a reserve currency has the authority to print money whenever it wishes to finance its imports or exports. With the increase in money printing, the money suplly in the country will rise, and this increases, the country with a reserve currency prioritize its own interests (Rozhentsova, 2012, p. 32).
- **Reserve Currency and International Power Dynamics:** At the international level, a country with its own reserve currency enables exporters, importers, borrowers, and lenders to conduct transactions in their own currency rather than foreign currencies. Furthermore, when they visit different countries, they have the ability to easily convert their currency into other currencies. Having a reserve currency enhances a country's power and prestige on the international stage. In fact, it has been emphasized that achieving political and military superiority can be facilitated through reserve currency (Subramanian, 2011, p. 4).
- **Facilitation in International Transactions:** A currency with reserve currency status is recognized as a primary means of payment in international trade and transactions. This facilitates transactions to occur more easily and quickly.
- **Financial Stability:** Another significant advantage of being a reserve currency is its ability to ensure a country's financial stability. Reserve currency status can increase demand for the country's currency, thereby supporting its currency's value.
- **Low-Cost Borrowing:** One of the benefits of being a reserve currency is the opportunity for a country to borrow at lower costs. Countries with currencies in demand worldwide can borrow from foreign investors at lower interest rates.
- **Immunity to International Crises:** Demand for a reserve currency is typically perceived as low-risk haven, which can protect the country with the reserve currency from periodic economic fluctuations (Moore, 2004, p. 635).
- **International Balance of Payments, Currency Valuation, and Curency Impact:** Countries are required to maintain their international balance of payments. Indeed, if a country experiences a high level of current account deficit, its national currency becomes devalued, leading to a currency crisis. However, the use of single currency in the international arena eliminates exchange rate risk and can reduce the current account deficit (Bonpasse, 2009, p. 166).

The growth and strengthening of the Chinese economy have provided opportunities for the increased use of the yuan on the international stage. The growth in production and foreign trade volume in China has contributed to the more widespread use of the yuan in global trade. Additionally, China's liberalization of the capital account, the development of financial infrastructure, and support for international agreements are significant steps towards the yuan becoming a global reserve currency. Major initiatives such as the "Belt and Road" project have also accelerated the internationalization of the yuan. In light of all these developments, it is highly likely that the Chinese yuan will become a strong currency in the future.

2. THEORETICAL FRAMEWORK

2.1. The Rise of the Chinese Currency Yuan

The efforts made by the People's Republic of China under the framework of a liberal market approach have had an impact on the use of its national currency, the Yuan. In order for the Yuan to become an important reserve currency, China has taken steps to achieve this status. To attain reserve currency status, China continues to take measures related to capital account openness and flexible exchange rate policies. In addition to these measures, China's strong economic indicators, such as its economic size and macroeconomic conditions, have supported the use of the Yuan.

The People's Republic of China has taken a series steps to make the Yuan an international currency. These steps include;

- ✓ China initially allowed the use of the Yuan in trade with neighboring countries and certain special regions. Leading large companies in Shanghai and Guangdong were encouraged to use the yuan in trade.
- ✓ Bilateral agreements were signed with South American countries, including Brazil, to use national currencies in bilateral trade. Additionally, in 2010, trade linked to the yuan was made freely available in Hong Kong, and all obstacles for other companies to open Yuan accounts were removed.
- ✓ China established the yuan market to facilitate transactions between firms in Hong Kong.
- ✓ In 2009, foreign banks were allowed to trade Yuan-denominated bonds in Hong Kong.
- ✓ Foreign investors coming to China were allowed to provide financing to overseas countries using the Yuan.
- ✓ In 2010, the Asian Development Bank sold approximately 1.2 billion Yuan-denominated bonds in the yuan market established in Hong Kong.
- ✓ In June 2011, China authorized firms engaged in trade with the United States to create Yuan-based deposit accounts (Barry, 2011, p. 5).

As part of its financial liberalization efforts, China launched the "Qualified Domestic Institutional Investor Program" in 2006 to allow its domestic enterprises to trade on other markets. This program was initially implemented in the Hong Kong market. However, due to both domestic and international credit crises that occured within the same year, this program was discontinued. To promote financial liberalization, the Yuan started being used in bilateral trade with overseas countries. Yuan usage gained momentum starting in the 2000's (Li, 2018, pp. 15-16).

In 2014, China implemented the "Stock Connect Program" to facilitate mutual trading between the Shanghai and Hong Kong stock exchanges. With this program, stock trading between China and Hong Kong began with a specified lower limit. As a result of the program, there were developments in the capital markets in China. Significant investments were made in the Shenzhen, Shanghai, and Hong Kong stock exchanges, and these exchanges became safe havens for investors. As a result of these developments, the Chinese Yuan started to gain presence on the international stage (Richardson, 2016, p. 5).

The international use of Yuan has increased with foreign investors starting to purchase bonds in China. Additionally, during this process, China has encouraged the use of bilateral currencies to reduce the dominance of the dollar in global trade. China aims to reduce transaction costs in trade and decrease dependency on the US dollar. In pursuit of this goal, China established the International Chinese Payment System (CIPS) to rival the SWIFT system, which is used for funds transfers. The introduction of the CIPS system reduced dependence on Western-style payment systems and expanded the use of the yuan. Furthermore, China has introduced the UnionPay payment cards as a competitor to payment cards like Mastercard and Visa (Prasad, 2017, pp. 114-127).

The Yuan, appreciating in tandem with the growth of the Chinese economy, was included in the Special Drawing Rights (SDR) basket in 2016. The SDR was created by the IMF in 1969 and is a currency that exists without a corresponding physical presence, serving as both a unit of account and additional reserve. Because the SDR lacks intrinsic value, it is used as a form of credit. The SDR, which has no physical existence, is used as a unit of account by organizations like the IMF and World Bank (Seyidoğlu, 2003, p. 29). The Chinese currency, the Yuan, with its substantial economic growth and high market share, accounts for %10.92 of the SDR basket. Yuan has successfully become the third most valuable currency in the SDR basket, following the dollar and the euro.

3. LITERATURE REVIEW

When the studies are examined, it is observed that there are no direct researches, especially on reserve currencies and, in this context, the Chinese Yuan. Therefore, in the literature review, central bank reserves, international reserves, and studies related to currencies have been examined. The studies related to total reserves in the literature are listed below.

Nowak et al., (2004) In their study, examined the increases in foreign exchange reserves using panel data analysis for 28 developing countries between 1986 and 2002. The study concluded that holding an adequate amount of reserves is estimated to reduce exchange rate volatility.

Zhang and Chen (2009) In the scope of their studies, they have noted that reserves increased in China after 1990, and this increase led to the appreciation of the Yuan's value. The authors used monthly data from the period between 1997 and 2009. The study also found that exports and foreign investments in the country influenced the reserves. It was concluded that the primary reason for the increase in foreign reserves was foreign investments and exports.

Park and Estrada (2009) In their study analyzed the determinants of reserves in 130 developing countries during the period of 1980-2004. The authors used Panel Data Analysis in their study. According to the findings, population, imports, and per capita GDP data were estimated to be significant and positively signed. Additionally, ecxhange rate volatility was found to be significant but negatively signed, while export data was estimated to be insignificant and positively signed.

Sula (2011) In the study, the author analyzed the key economic factors influencing reserve accumulation in 108 developing countries during the period of 1980-2007. The author employed Panel Data Analysis in the study. According to the analysis results, variables such as openness ratio, population, per capita GDP, exports, exchange rate, dollar interest rates, and crisis dummy variables were estimated to be significant.

Mwase (2012) In the study, the author investigated the reasons for holding reserves in developing countries during the period of 1999-2010. The author employed Panel data Analysis in the study. According to analysis results, it was found that imports and institutional structure were significant factors in reserve holding, while exchange rate volatility and dummy variables representing crises were found to be insignificant. The studies conducted on GDP forecasting in literature are as follows.

Junoh (2004) conducted a study to forecast the GDP (Gross Domestic Product) in Malaysia. The author found that, compared to other econometric studies, Artificial Neural Networks (ANN) yielded superior results in their research.

Tkacz (2011) In their study, they used the ANN model to make predictions regarding GDP growth in Canada based on quarterly data from 1968 to 1992. In the study, the author employed ARIMA, Linear, and ANN models. The results of the three applications were compared, and it was noted that ANN, especially in the long term, provided more realistic results.

Mutiara et al., (2021) examined the relationship between GDP, workers remittances, and total reserves for Indonesia between 2013 and 2017. The study utilized regression analysis. The study found the relationship betwwen reserves and the exchange rate to be insignificant. Another study focused on stock prices. Tektaş and Karataş (2004) they predicted the stock prices of seven compaines in their studies. In their research, the authors combined daily data with the linear regression method and an Artificial Neural Network (ANN) model. The study concluded that the ANN model provided more realistic results. The study conducted for inflation forecasting is provided below.

Erilli, Eğrioğlu, Yolcu, Aladağ and Uslu (2010) they have forecasted inflation in their studies. The results obtained involved an examination of Consumer Price Index (CPI) values, and predictions were made using Artificial Neural Networks. The study found that the model's best prediction value was 0.3604. ın the study, the inflation rate was calculated as 0.36. The literature summary for the subject of study, which pertains to foreign exchange reserves, is presented below.

Submariman (2011) In their study investigating the transition of the yuan become a reserve currency surpassing the Dollar, they conducted an empirical analysis for the period between 1990 and 2010 on countries holding reserve currency status. The authour found that there was a significant relationship of %67 between a country's total reserves, its share in the global economy, its share in world trade, and its share in global capital in the study.

Alp, Kılıç and Gönülalçak (2020) in their study, made predictions about the future of reserve currencies. The authors used panel data analysis and trend analysis in their study. The study concluded that the United States is expected to maintain its reserve currency status, the Euro's share in reserve currencies is likely to decrease, and the Chinese Yuan could become a strong reserve currency in future.

The key determinants of reserve currencies can be listed as follows; macroeconomic size, financial development, a high share of global GDP, low inflation rates, a high share of total reserves in GDP, having a flexible exchange rate, and a high share in global trade.

Chinn and Frankel (2005) In their work titled "Can the Euro Replace the Dollar?" identified the key determinants of reserve currencies as economic size inflation rate, exchange rate variability, and financial development.

Helleiner (2008) In his study, stated that there are primarly three economic determinants of reserve currencies, which are liquidity, economic size, and trust. However, the author explained that political factors take precedence over these factors in his study.

In another study, Yingli and others (2014) in their study, analyzed the status of Chinese Yuan as a reserve currency. The authors explained that the key determinants of reserve currencies are macroeconomic size and external factors.

In this study, three important variables are the CPI, the global GDP share, and the share of total reserves in GDP. The data for Euro is based on Germany, for Sterling it is based on the UK, for the Dollar it is based on the USA, and for the Yuan, it is based on China. In this context, it can be said that this study differs from other studies in that it focuses specifically on reserve currencies and Chinese Yuan. Therefore, the study's particular focus on the Chinese Yuan is believed to enhance its originality and contribute to future research on the subject.

4. DATA SET AND USED VARIABLES

The data for the total Reserves/GDP variable, pertaining to the total reserves of the United States, China, Germany, and United Kingdom, as well as their respective total GDP values, were collected by us from the World Bank and IMF websites. Within the total reserves, components such as a country's total gold reserves, foreign exchange reserves, IMF reserve positions, and Special Drawing Rights (SDR) are included. Similarly, we have determined the share of countries in the world GDP. Consumer Price Inflation (CPI) rates for countries were selected as they best reflect the value of a currency. These three criteria are important for assessing the reserve currency status and the health of the international financial system because the reliability and usability of reserve currencies are crucial for trade, investement, and financial transactions. Therefore, these data are significant for monitoring the functioning of the international monetary system and economic relations among countries.

The primary focus of the study is the Chinese Yuan; however, the reason for including other reserve currency-holding countries is to understand their impact on the functioning of the international financial system and global economic relations. These countries reserve currency status plays a significant role in global trade, investment, and financial stability. Therefore, the main objective of the study is to gain a more comprehensive perspective by examining other reserve currency-holding countries in addition to the Chinese Yuan.

For a country's currency to be considered a reserve currency, several criteria should be taken into account. Factors such as the stability, liquidity, and role in international trade of the currency are important. Additionally, other

conditions necessary for a currency to become a reserve currency in a country include economic and political stability, a well-developed legal infrastructure, financial system reliability, developed capital markets, social stability, credible economic policies, and indenpence of the central bank (Chinn & Frankel, 2005, p. 6-7).

The data covers the years 1970-2022. The time interval the variables Consumer Price Index (CPI) and Total Reserves/GDP for China has been set as 1977-2022. The information for these variables is provided in table 1.

Table 1: Data Set Used in the Analysis and Their Definitions

Variables	**Source**
Total Reserve/GDP (%)	World Bank, IMF
CPI (%)	World Bank, IMF
GDP Share % (World)	World Bank

5. METHOD

Why did we choose Machine Learning and ANN models? Machine learning is a powerful tool for analyzing complex data sets and predicting future events. ANN are particularly effective for handling large and intricate data. Therefore, we chose the ANN model to address the multitude of variables and complexity in our study. Why did we needed to analyze the complexity of these variables with ANN? The mentioned variables involve numerous interactions and complexities. ANN are a machine learning technique used to handle such complexities. Our model can help identify hidden relationships and patterns among these variables, enabling us to make more accurate predictions about future scenarios. The primary goal is to better understand and predict the future reserve currency status and economic performance of four different countries using this method. These predictions will be used to guide international financial relations and economical decisions.

5.1. Artifical Neural Networks

ANN; by taking inspiration from the human brain, it delivers successful outcomes in various areas such as appropriate classification, correlation, feature extraction, and generalization. ANN, which forms its own information from data obtained from data, later transfers this formed information into the system. The fundamental characteristics specified for ANN are as follows (Öztemel, 2006, pp. 29-30).

- ANN performs machine learning. It learns data through machine learning techniques and responds similarly to similar events.

- ❖ The working format of ANN differs from other programs. It processes data in a distinct manner compared to other software.
- ❖ ANN facilitates learning through sample events. In this system, the creation and collection of data are highly important. It aids in reaching the desired outcome by utilizing the data. Success is not possible in this system if events are not provided in all aspects.
- ❖ The ANN system functions even with incomplete information. It produces results despite missing data.
- ❖ The system deduces information about unseen events based on the provided events in the network.

In the ANN model, neurons or nevre cells are the fundamental elements of the central system. It is known that there are approximately ten billion nerve cells in the human brain. The system resembles tree branches in that it uses thin pathways to transmit information from different cells to the central body of the cell. Structures referred to as "axons" serve the purpose of transmitting information outward in cells known as "dentrites." Axons separate from each other as they follow the thin pathways, forming dendrites in this way. The system formed by the connections of axons and dendrites, as seen in Figure 1, is called "synapse" (Yüksek, 2007, p. 11).

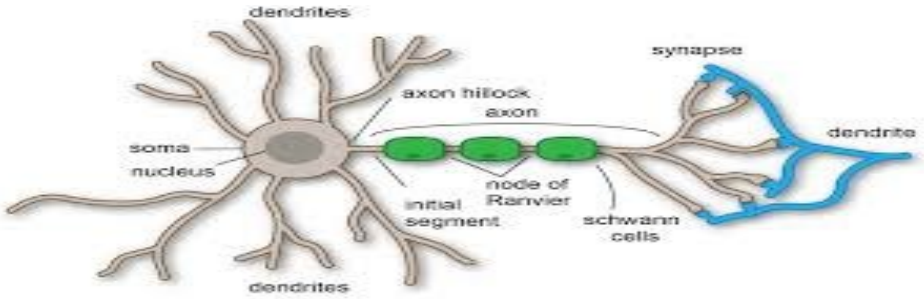


Figure 1: Nervous System
Source: (Yüksek, 2007, p. 11).

Neural networks are composed of readily accessible different units and retain the data or events they use within themselves, tending towards memorization. A nevre cell distributes the information it receives in paralel for efficient utilization. ANN mimic the human brain in two distinct ways. These characteristics are as follows: neurons in the nevre cell store acquired information, and events and information are obtained through learning (Haykin, 1999, pp. 1-2).

ANN have a structure similar to the nerves in the human brain. In Figure 2, inputs to the system are provided through the input layer. The

"process" that make up the networks process the received information and data, forming connections between this information and within the system. The resulting connections are used to create models through the "processes." In neural networks, having a hidden layer is essential to solving non-linear and complex problems, as shown in Figure 2.

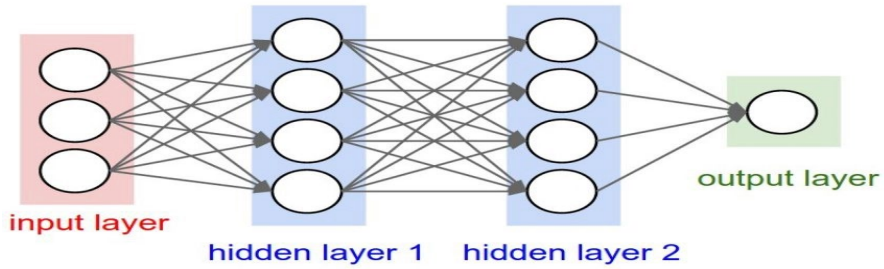


Figure 2: ANN Layers
Source: (Aydın, 2019, p. 18)

The elements in the input layer receive incoming information into their own systems and transfer this information to the hidden layer, also known as the intermediate layer. The hidden layer processes the information transmitted from the input layer and passes it on to the other layer. In a neural system, there can be multiple intermediate layers. Neurons within the hidden layer exhibit different characteristics depending on the types of neural Networks. Lastly, the process in the layers transfer information from the hidden layer to the output layer. The output layer processes this information and generates output for his inputs. The outputs generated in the output layer are subsequently transferred externally.

The applications of Artificial Neural Networks (ANN) are listed as follows: check reading processes, data mining, evaluation stages of credit applications, product performance predictions, fingerprint recognition, sales, brain modeling, heart attack treatments, quality control, detection of cancer types, job schedules; and economic research (Elmas, 2003, p. 42). Predicting data in economic and financial domains is crucial. ANN are used to make future predictions based on parameters in the field of economics (Yurtoğlu, 2005, p. 26).

6. FINDINGS

In the scope of this study, an ANN model was used to predict economic variables for four different countries, namely China, the United States, the United Kingdom, and Germany, for the period from 1970to 2022. These economic variables included the Consumer Price Index (CPI), the share of these countries in the global GDP, and the ratio of Total Reserves to GDP. The

prediction period was set at 5 years. This model in an effective method used to forecast future trends in countries economic indicators using historical data. In the study, Germany has been taken as a representative of the euro.

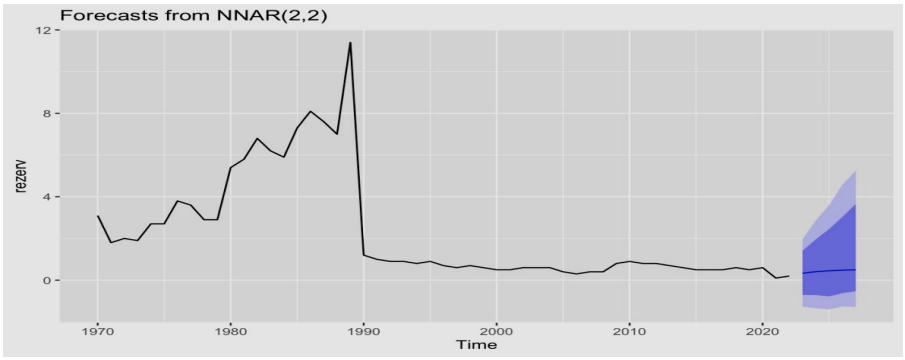
6.1. The Forect of Total Reserves to GDP for the United States

Reserves represent assets held and controlled by monetary authorities in countries, readily available for use. Due to their convertibility features, reserve currencies are used as a means of payment on the international stage. Reserve currencies can vary due to the dynamic nature of national economies. Reserves are predominantly held in foreign currencies. Today, the dollar is the most widely held currency as a reserve (TCMB, 2011, p. 1). The predicted Total Reserves to GDP values for the United States using ANN are provided in Table 2.

Table 2: Total Reserves to GDP (USA)

index	Point Forecast	Lo 95	Hi 95
<dbl>	<dbl>	<dbl>	<dbl>
2023	0.3325745	-1.273123	1.960146
2024	0.4068202	-1.345569	2.869817
2025	0.4516708	-1.400610	3.595995
2026	0.4798700	-1.260344	4.582020
2027	0.4980664	-1.287267	5.254467

When examining Table 2, it is predicted that in the coming years, the ratio of total reserves to GDP in the USA will remain at low levels. In 2023, it is forecast that the share of reserves in GDP will be %0.3, and although there will be an increase in the following years, the share is expected to remain low. The lowest and highest predicted values considered within the scope of the ANN analysis are also provided in table 2 based on %95 accuracy level. These values have been determined as a precaution against potential future economic challenges. The predictions for the share of total reserves in the U.S. GDP are provided in Graph 1.



Graph 1: Prediction Graph % (USA)

In graph 1, data between 1970 and 2022 represent actual values, while data beyond 2022 reflect estimated values. As observed in the graph, the share of total reserves held by the United States within the country's GDP has remained at low levels. This situation could potentially harm the strength of the dollar in the future because reserves can be actively utilized during economic crises. It is expected that the share of total reserves in the U.S. GDP will average approximately %0.4 over the next 5 years.

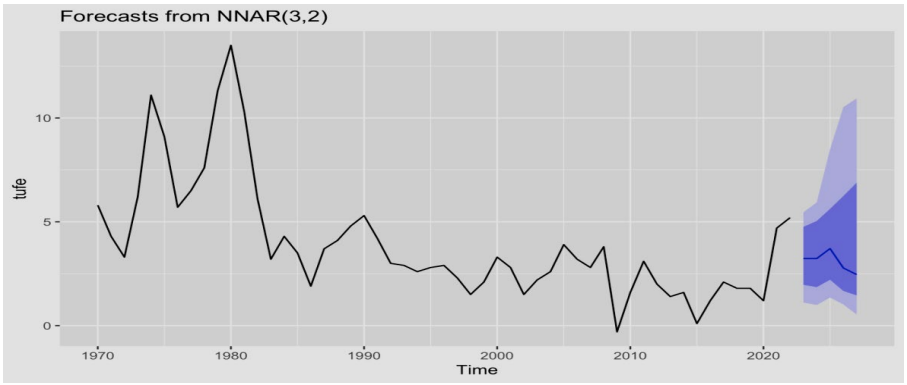
6.2. CPI Forecast for the United States

In a country, inflation, due to continuous rise in prices, leads to a decrease in people's purchasing power and a decline in prosperity. Inflation, which is more common in developing or less developed countries, can sometimes affect the global economy as well. Therefore, it is of great importance for countries to keep inflation under control. Inflation causes product prices to increase when there is insufficient production. These increases result in the depreciation of the country's currency. One of the most important criteria for a country to be recognized as a reserve curency is the Consumer Price Index (CPI). The predicted values for the Consumer Price Index (CPI) variable, considered for the United States using ANN, are provided in Table 3.

Table 3: The Inflation Rate Forecast Values for the United States (%)

index	Point Forecast	Lo 95	Hi 95
<dbl>	<dbl>	<dbl>	<dbl>
2023	3.232441	1.1172924	5.458493
2024	3.232997	0.9914548	5.935546
2025	3.710899	1.3515848	8.499533
2026	2.775713	1.0208852	10.524451
2027	2.459247	0.5346047	10.942637

When examining Table 3, it is predicted that the CPI variable will decrease for the United States. It is estimated that in 2023, the CPI will be %3.2, in 2025 it will increase to %3.7, and then decrease to %2.7 in 2026 and %2,4 in 2027. Data related to the CPI forecast for the United States is provided in Graph 2. Due to the global economic downturn in 2021 and 2022, inflation reached high levels in the United States. However, it is predicted that this situation will subside in the coming years.



Graph 2: CPI Forecast Values % (USA)

The relationship between the value of the dollar and inflation is complex; however generally, decreasing inflation can have a positive impact on the value of the dollar. This is because low inflation can increase the purchasing power of the dollar and help it remain a strong currency in international trade. This situation can imply economic stability and confidence.

6.3. GDP(World Share) Forecast for the United States

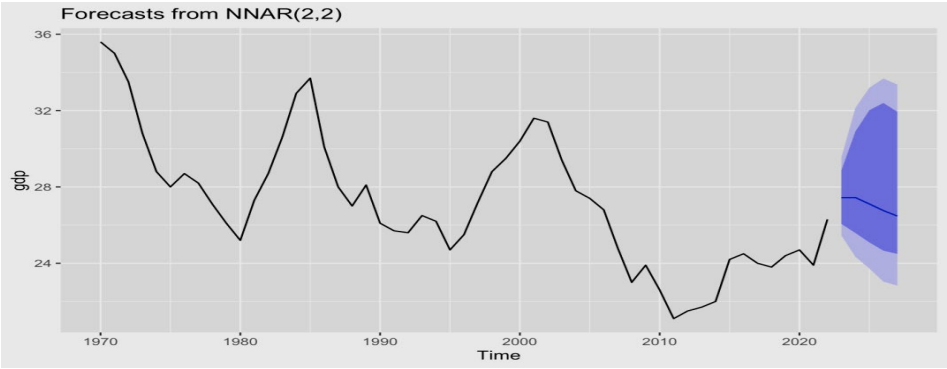
The share a country holds in the global economy emerges as one of the most crucial criteria for determining its size. The United States leads with a share of %27 in the world economy. China follows at %17 (World Bank, 2022). Various factors such as economic crises, diseases, natural causes, and many others can affect the GDP (world share) ratios of economies. Despite being the world's largest economy, it is expected that the United States will see a decrease in its share of the global GDP. The predicted values for the share of the United States in the global economy, calculated within the scope of ANN, are provided in table 4.

Table 4: The Share of the United States in World GDP (%)

index	Point Forecast	Lo 95	Hi 95
<dbl>	<dbl>	<dbl>	<dbl>
2023	27.43864	25.45415	29.54765
2024	27.44208	24.34019	32.14033
2025	27.10753	23.72269	33.19959
2026	26.76156	23.03994	33.67876
2027	26.47396	22.83075	33.36938

According to table 4, based on predictions made by ANN, it is expected that the United States share in the global economy will decrease in the coming years. In 2023, the U.S. share is projected to be %27,4, in 2025, it is expected to be %27,1, and in 2027, it is anticipated to decline to %26,4. A decrease in the share of the global economy can have a negative impact on a country's reserve currency status. This is because a country recognized as a reserve currency is typically considered to have a stable and strong economy. A decrease in the share suggests a reduction in that country's economic power and, as a result, can signal erosion of its credibility as a reserve currency. In such a scenario, the role of that country's currency in international trade and financial transactions may also diminish. The estimated values for the variable of the United States GDP (world share) predicted using ANN method are provided in graph 3. As seen graph 3, it is anticipated that the share of the USA in the global GDP will decrease over the next five years. This situation could potentially harm the value of the dollar since the share in the global economy is one of the most

critical criteria for reserve currency status.



Graph 3: The United States Share in World GDP (%)

6.4. Total Reserves/GDP Estimate for Germany

In the study, Germany has been taken as a representative of the Euro. Its strong industrial base, high export volume, and competitive manufacturing sector make Germany one of the key supporters of the Euro. Germany's economic strength is one of the factors influencing the value and stabililty of the Euro. Thanks to its high-quality products, excellent infrastructure, and robust industrial sector, Germany holds a significant share in exports. This situation positively affects the Euro in trade (IMF, 2022).

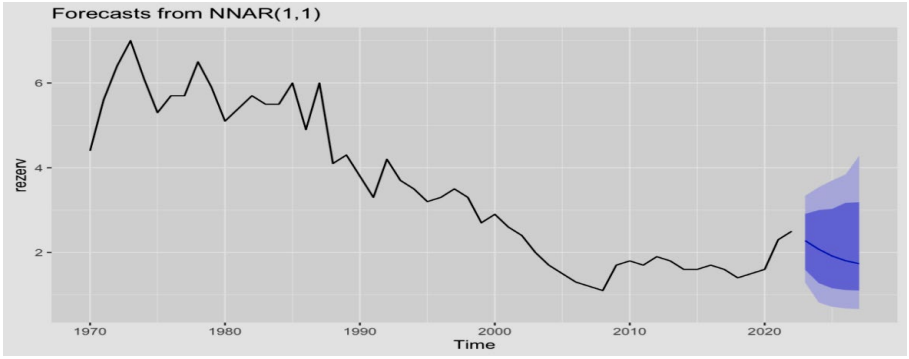
The estimated values for the Total Reserves/GDP variable within the scope of ANN for Germany are provided in table 5.

Table 5: Total Reserves/GDP Estimate % (Germany)

index <dbl>	Point Forecast <dbl>	Lo 95 <dbl>	Hi 95 <dbl>
2023	2.278418	1.2911006	3.338071
2024	2.075681	0.8196860	3.537806
2025	1.914925	0.7159335	3.698836
2026	1.803604	0.6785106	3.841462
2027	1.734423	0.6616691	4.279895

When table 5 is examined, it is predicted that the Total Reserves/GDP variable will decrease in the coming years in Germany. For Germany, it is expected that this variable will be %2.2 in 2023, %2.0 in 2024, %1.9 in 2025, %1.8 in 2026, and %1.7 in 2027. The estimated values for the Total

Reserves/GDP variable are provided in graph 4. The graph shows the changes between 1970 and 2020, along with projections for the next five years.



Graph 4: Total Reserves/GDP (%)

The decrease in the share of total reserves within a country's GDP can negatively affect the value of its reserve currency. Lower reserves provide less flexibility fort hat country to balance its external trade imbalances and support international payments. This can lead to a depreciation of the currency because investors and trading partners may question the economic stability and payment capaity of that country. As a result, a decrease in reserves can lead to a loss of currency value and economic uncertainty.

6.5. Inflation Forecast for Germany

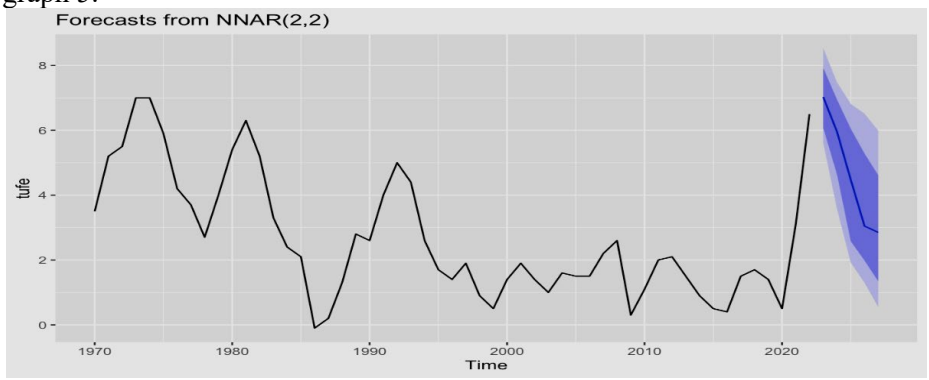
Due to the Covıd-19, the Eurozone contracted by %6.1 in 2020. However, subsequent measures resulted in a growth rate of %5.2 for the Eurozone in 2021. The Russia-Ukraine conflict has created a crisis for Europe due to its high dependency on Russian natural gas. Rising energy prices have led to an increase in inflation in the Eurozone. Because of this increase, the European Central Bank decided to raise its policy interest rate by 75 basis points on October 27, 2022. It is expected that these increases will continue in the coming years. According to World Bank data, the Eurozone achieved a growth rate of %3.5 in 2022. IMF forecasts indicate that growth is expected to be %0.5 in 2023 (Global Economic Report, 2022).

Table 6 provides the values of the Consumer Price Index (CPI) variable predicted with the ANN model for Germany.

Table 6. CPI Forecast % (Germany)

index <dbl>	Point Forecast <dbl>	Lo 95 <dbl>	Hi 95 <dbl>
2023	7.023327	5.6094967	8.527342
2024	5.953954	3.5783475	7.476577
2025	4.473713	1.9198838	6.812490
2026	3.047398	1.2976548	6.512134
2027	2.849452	0.5496745	5.985394

As seen in table 6, it is predicted that CPI variable in Germany will decrease in the coming years. In 2023, the CPI is expected to be %7.0, in 2024 it is expected to be %5.9, in 2025 it is expected to be %4.4, and in 2027 it is expected to be %2.8. The estimated values for the CPI variable are shown in graph 5.



Graph 5: CPI Forecast (Germany)

Decrease in the Consumer Price Index generally has a value-enhancing effect on the reserve currency. Low inflation leads to an increase in the purchasing power of the currency and can boost confidence in that currency among international investors and trading partners. Therefore, low CPI contributes to strength of a reserve currency.

6.6. GDP(World Share) Forecast for Germany

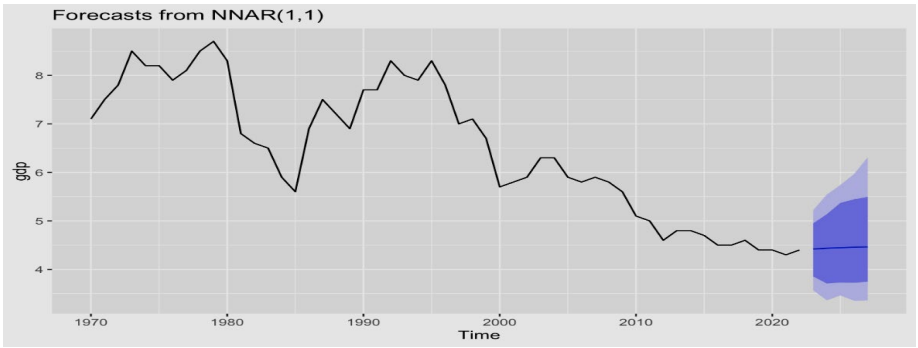
The size a country's economy is one of the most significant factors determining the value of its currency. Germany holds approximately a %4 share of the world's Gross Domestic Product (GDP). Despite being the fourth-largest economy in the world, Germany's share remains relatively low. The Eurozone, of which Germany is a part, accounts for approximately %17.9 of the world's GDP, a share equivalent to that of China alone.

The Gross Domestic Product (world share) variable for Germany has been forecasted using ANN for a period of five years. The predicted values the forecast are provided in table 7.

Table 7: GDP (World Share) Forecast for Germany %

index <dbl>	Point Forecast <dbl>	Lo 95 <dbl>	Hi 95 <dbl>
2023	4.420138	3.568770	5.219733
2024	4.435460	3.363290	5.541536
2025	4.447203	3.463071	5.740849
2026	4.456252	3.354094	5.964301
2027	4.463254	3.361226	6.309466

When examining table 7, it can observed that Germany's GDP (world share) is expected to remain at the same levels in the upcoming period. It is predicted that Germany's GDP share will stay approximately at the %4 level over the next five years. The share of Germany in the global economy over the years is presented in graph 6.



Graph 6: GDP (World Share) %

The low share that Germany holds in economy can often weaken the Euro. This is because the value of the Euro is closely tied to the economic performance and strength of the Eurozene. Germany, being one of the largest economie in the Eurozone, plays a significant role. If germany experiences low

economic growth or a reduced share, it can undermine the overall performance of the Eurozone, which, in turn, may negatively impact the value of the Euro.

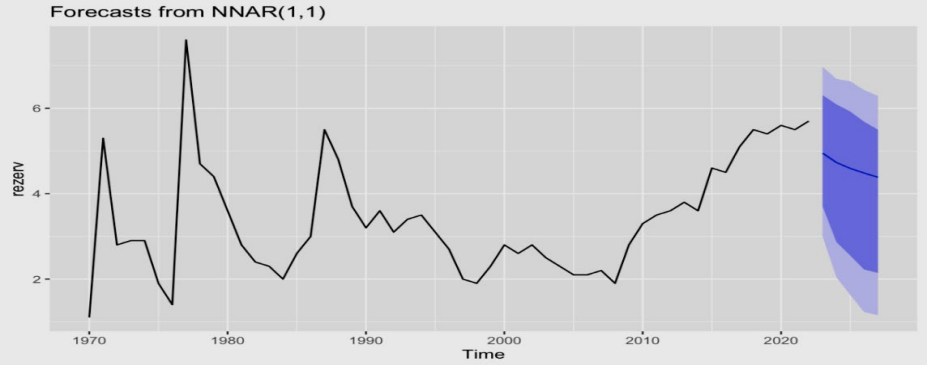
6.7. The Estimated Total Reserves/GDP Ratio for the United Kingdom

Officially known as Great Britain, England has a population of approximately 67 million. Its system of government is a constitutional monarchy and parliamentary democracy, and the official currency is the Sterling Pound. The country ranks as the world's sixth-largest economy with a GDP value of around 3 trillion dollars. Per capita income, according to 2022 data, stands at $47,232, with a Consumer Price Index (CPI) of %10.5, a current account balance of -%4.8, and an unemployment rate of %3.7. the English economy grew by %7.4 in 2021 and by %4.1 according to 2022 data (IMF, 2022). Under the scope of Artificial Neural Networks, the share of total reserves within the country's GDP for the next five years has been estimated for the United Kingdom. The estimated values for the variable are provided in table 8.

Table 8: The Forecasted Values for Total Reserves/GDP for the United Kingdom

İndex <dbl>	**Point Forecast** <dbl>	**Lo 95** <dbl>	**Hi 95** <dbl>
2023	4.950278	3.001745	6.972337
2024	4.729865	2.040251	6.687705
2025	4.592423	1.629135	6.632046
2026	4.483703	1.230084	6.427962
2027	4.385033	1.153660	6.289269

As seen in table 8, it is predicted that the share of total reserves within the country's GDP will decrease in the upcoming periods for the United Kingdom. The forecast suggests that the share of total reserves within the country's GDP will be %4.9 in 2023, %4.5 in 2025, and %4.3 in 2027. Depending on the highest estimate, it is expected that by 2027, the share of total reserves within the country's GDP in the United Kingdom will be %6.2, while the lowest estimate suggests it will be %1.1. The estimated values for the variable are provided in graph 7. The variables time range has been set from 1970 to 2022.



Graph 7: The Forecast Total Reserves/GDP (%)

A low share of total reserves within the United Kingdom's GSP often reduces the country's international financial credibility. Low reserves can maket he UK more vulnerable to trade imbalances and payment deficits. This situation may erode the confidence of international investors and currency speculators in the British Pound.

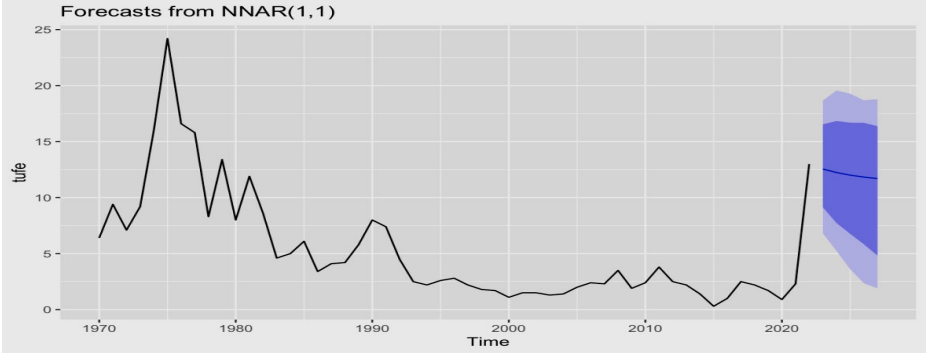
6.8. The Forecast for Consumer Price Index(CPI) for the United Kingdom

High inflation in the United Kingdom (UK) can have a negative impact on the value of the reserve currency, the pound sterling. High inflation reduces the value of the country's currency and diminishes purchasing power. This can lead investors to abandon the pound and switch to other stronger currencies. As a result, the exchange rates of the pound sterling can decline, international trade can become more challenging, and the economic stability of the country can be at risk. Under the scope of ANN, the Consumer Price Index (CPI) forecast values for the UK are provided in table 9. Additionally, the table includes the lowest and highest forecast values.

Table 9: The Forecast CPI for the UK

İndex <dbl>	Point Forecast <dbl>	Lo 95 <dbl>	Hi 95 <dbl>
2023	12.55530	6.805323	18.65838
2024	12.23895	5.242260	19.57012
2025	12.00724	3.609784	19.28101
2026	11.83405	2.350354	18.69148
2027	11.70267	1.895476	18.78305

As seen table 9, it is predicted that the CPI in the UK will exhibit a decreasing trend. However, despite this decrease, inflation is expected to remain in double digits. In 2023, the CPI in the UK is projected to be %12.5, followed by %12.2 in 2024, %12.0 in 2025, %11.8 in 2026, and %11.7 in 2027. According to the highest and lowest forecast values, the CPI is expected to be %16.5 and %9.1 in 2023, and %16.3 and %4.8 in 2027, respectively. The estimated values for the CPI variable are shown in graph 8. The variables time range has been set as 1970-2022.



Graph 8: CPI Forecast

6.9. The GDP(World Share) Forecast for the United Kingdom

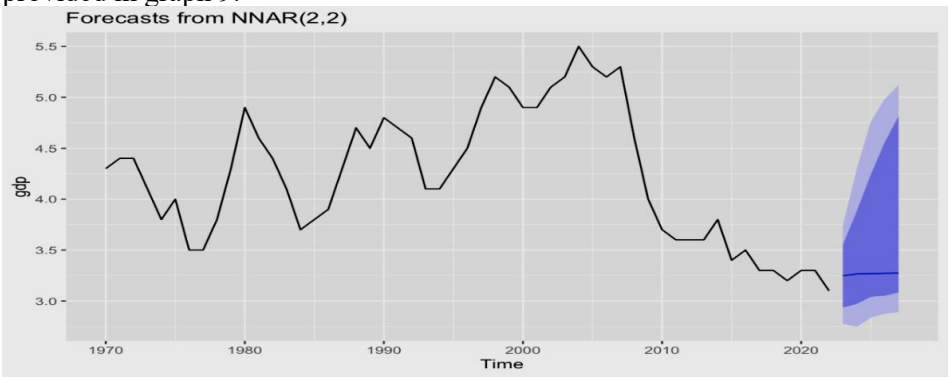
Despite being the seventh-largest economy in the world, the United Kingdom has a relatively low share in the global GDP. In 2021, UK's share in the global GDP was realized at %3.3. according to the data for 2022, its share in the GDP decreased to %3.1.The forecast values for the UK's share in the global GDP are provided in table 10.

Table 10: The GDP (world share) Forecast

index <dbl>	Point Forecast <dbl>	Lo 95 <dbl>	Hi 95 <dbl>
2023	3.247989	2.778082	3.736880
2024	3.266287	2.745008	4.294307
2025	3.268852	2.835909	4.757950
2026	3.272089	2.874587	4.981577

2027	3.274285	2.891861	5.120384

When examining table 10, it can be observed that the forecast predicts the United Kingdom share in the global GDP to remain at low levels. For the next five years, it is expected that the UK share in the global GDP will average around %3. The values concerning the UK's share in the global GDP are provided in graph 9.



Graph 9: The GDP (world share) Forecast

The know share of the UK in the global economy can limit the international influence of the reserve currency, the pound sterling. A low share can reduce the ability of the pound to be used as a global reserve currency because reserve currency status is typically based on large and powerful economies. This situation can result in the pound playing more limited role in international trade and financial transactions compared to other reserve currencies.

6.10. The Total Reserves/GDP Forecast for China

The People's Republic of China was established on October 1, 1949, under the leadership of Mao Zedong. During Mao's era, China, under communist rule, faced challenges and did not experience significant success. However, under the leadership of Deng Xiaoping, who took over later, China has grown into a massive economy up to the present day. During Deng's period, the transition to a market-oriented economy led to significant development in various sectors of the Chinese economy. China's accession to the World Trade Organization (WTO) in 2001 contributed to the growth of its international trade figures. Currently, China holds the position of the world's second-largest economy (Naughton, 2007, p. 66).

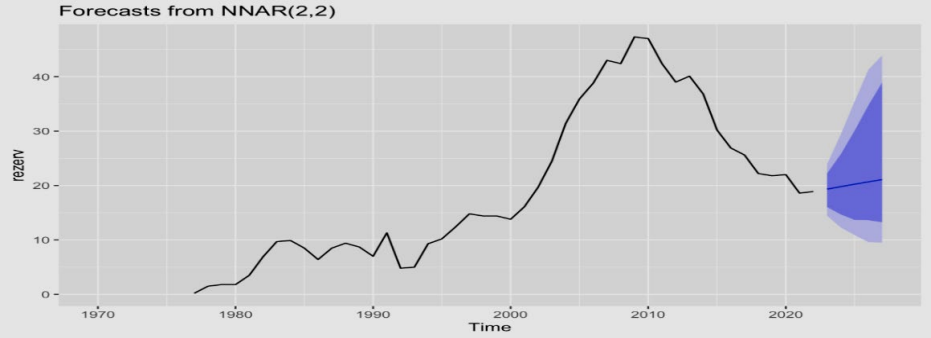
The study focused on examining the potential for China's currency, the

Yuan, to become a strong reserve currency in the coming years. In this research, ANN were utilized to analyze the current status of the Chinese currency for the next five years. The estimated values fort his variable are presented in table 11.

Table 11: Estimated Values of Total Reserves/GDP for China

index <dbl>	Point Forecast <dbl>	Lo 95 <dbl>	Hi 95 <dbl>
2023	19.33088	14.444974	23.92252
2024	19.79048	12.284082	29.39659
2025	20.24291	10.897102	35.43839
2026	20.67497	9.603783	41.26489
2027	21.08203	9.497206	43.89603

As seen in table 11, it is expected that the share of total reserves within the country's GDP in China will increase in the coming years. In 2023, the share of total reserves in GDP is projected to be %19.3, in 2024 it is expected to be %19.7, in 2025 it is anticipated to reach %20.2, in 2026 it is estimated to be %20.6, and finally, in 2027, it is forecasted to be %21.0. having a high share of total reserves provides an advantage for China because these reserves consist of assets that can used when needed. These reserves can be effectively utilized to address any potential economic adversities. The estimated values for this variable are provided in graph 10. Due to data limitations, the variables time range has been set from 1977 to 2022.



Graph 10: Estimated Values of Total Reserves/GDP for China

Having a high share of total reserves within the country's GDP in China allows the Yuan to be more widely accpted and strenghthened as an international reserve currency. This is because high reserves provide opportunities for the Yuan to be used more extensively in international trade and financail transactions. Additionally, substantial reserves enhance China's economic stability and its ability to cope with crises, thereby increasing the international reliability and attractiveness of the Yuan.

6.11. Inflation Forecast for China

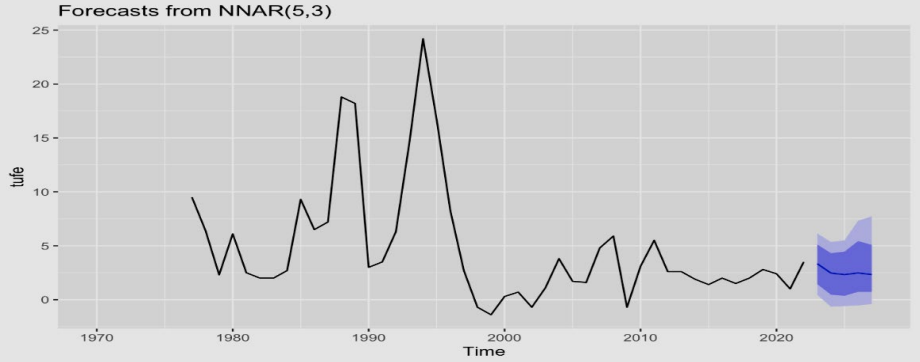
In China, the world's second-largest economy, inflation continues to remain at low levels. In 2021, the CPI was around %1, but due to the virus control measures taken in 2022, inflation rose to %2.2. However, this rate in China is relatively low compared to inflation in other countries with reserve currencies. In 2022, the U.S. had a CPI of %6.5, Germany had %8.7, and UK had %10.5. The predicted values for the CPI variable within the scope of ANN for China in table 12.

Table 12: Inflation Forecast (%)

index <dbl>	Point Forecast <dbl>	Lo 95 <dbl>	Hi 95 <dbl>
2023	3.334469	0.4434184	6.140697
2024	2.465490	-0.6608835	5.348768
2025	2.325134	-0.5879793	5.498787
2026	2.478675	-0.5379454	7.322232
2027	2.328692	-0.4025811	7.723134

The Consumer Price Index (CPI) is among the most significant factors determining the value of a country's currency. High inflation in a country will

devalue its currency. According to the forecast results presented in table 12, it is expected that CPI will remain at low levels in China. In 2023, CPI is predicted to be %3.3, in 2024 %2.4, in 2025 %2.3, in 2026 %2.4, and finally, in 2027, it is expected to be %2.3. The predictions for the CPI variable analyzed for China are presented in graph 11. The time frame CPI is set as 1977-2022.



Graph 11: CPI Forecast

The low levels of the CPI in China may increase the potential for the Yuan to become a reserve currency in the future. With economic stability and continuous growth, China could become one of the leading players in the global economy in the coming years. If this happens, there is a high likehood that the Yuan could become an international reserve currency. However, for the Yuan to be accpted as a reserve currency, it needs to be used more extensively in international trade. Currently, the Yuan's share in the world payment system is only %3.2, whereas the dollar plays a significant role in international payments with a share of about %40.

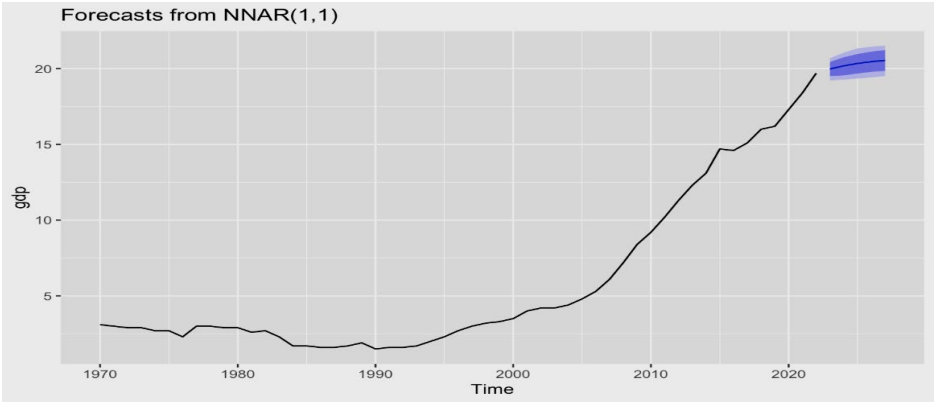
6.12. GDP(World Share) Forecast for China

In 2022, the Chinese economy grew by %3 on an annual basis, bringing China's GDP to around 18 trillion dollars. The growth in China fell short of the targeted rate of %5.5, primarily due to restrictions imposed as a result of Omicron cases. China's zero-tolerance policy towards Covid-19 led to relatively closed economy, which had a negative impact on economic growth. With an approximate %18 share of the global GDP, China stands as the second-largest economy in the world, following the United States (World Bank, 2022). The predicted values for the GDP (world share) variable for China, using Artificial Neural Networks, are provided in table 13.

Table 13: GDP (World Share) Forecast for China (%)

index <dbl>	Point Forecast <dbl>	Lo 95 <dbl>	Hi 95 <dbl>
2023	19.97780	19.21523	20.68979
2024	20.18821	19.28533	21.05717
2025	20.34561	19.34995	21.33807
2026	20.46226	19.42247	21.45346
2027	20.54809	19.51411	21.51738

According to the predictions, China's share in the global GDP is expected to increase in the coming years. According to the forecasts, in 2023, China's share in the global GDP will be %19,9, in 2024 it will be %20.1, in 2025 it will be %20.3, and in 2027 it will be %20.5. Based on the owest estimate, China's share the global GDP is projected to be approximately %19, while based on the highest estimate, it is expected to be approximately %21. The forecasted values for China's share in the global GDP are presented in graph 12.



Graph 12: GDP (World Share) Forecast for China

The increase in China's share in the global economy can encourage the wider accptance of the Yuan as an international reserve currency. A higher economic share can enable the Yuan to be used more extensively in international trade anf financial transactions. This can lead to increased demand for and usage of the Yuan as an international reserve currency. Furthermore, greater aceptance of the Yuan as a reserve currency can enhance China's

international financial ifluance and facilitate international trade. However, achieving these changes may require further opening up of China's financial markets and promoting the free floating of the Yuan. This process reflects greater integration into the international financial system while lso recognizing China's increasing economic power.

7. CONCLUSION AND RECOMMENDATIONS

Reserve currency is used as the primary currency for international trade having a reserve currency allows a country to facilitate international trade more easily and effectively. The reserve currency is used in a significant portion of trade invoices and international payments, ensuring that payments are made quickly and reliabliy. Having a reserve currency comes with several advantages, including cost savings, discounts in internatioanl transaction, providing liquidity, financial reliability and stability, international respect, and prestige. The Chinese currency, the Yuan, has the potential to become a strong reserve currency in the future. China has increased its economic power in tandem with its growth and development in the global economy. The international acceptance of the Yuan, its inclusion in the SDR basket, and China's effectiveness in international trade all contribute to strengthening the Yuan's role as a reserve currency. China's significance as an economic player can encourage greater use of the Yuan in the financing and settlement of international trade. Additionally, the Chinese government is taking steps to promote the internationalization of the Yuan. However, it also possible that it may face some challenges in becoming a reserve currency. Strong reserve currencies typically require a stable economy, liquidity, a freely floating exchange rate, and a reliable legal system. There fore, for China's Yuan to attain reserve currency status, it may need to provide these factors and further integrate itself into the international financial system.

According to the forecast results, China appears to meet the criteria for being a reserve currency in areas such as CPI, Total Reserves/GDP, and GDP (world share). This suggests that China's role as an international player in the economic arena is likely to strengthen. Over the next five years, a decrease in the CPI rate is expected in China. This means that CPI in China will decrease in a controlled manner. A low inflation rate will boost the value of the Yuan. This implies that China's influence in the global economy will grow, and it will play a more significant role in international trade. According to the forecast results, it is expected that the share of total reserves within the country's GDP in China will increase. This implies that China's total reserves will reach higher levels relative to its economic size. This, in turn, can contribute to China gaining more power in external paymaents and becoming more integrated into the international financial system. Based on all these results, there is a possibility

that the Chinese Yuan (RMB) may become a strong reserve currency in the coming years.

China should accelerate economic and financial reforms, increase market openness, and continune the process of liberalization. A more flexible exchange rate regime and further liberazition of capital movements could encourage the broader use of the Yuan in international trade. China should deepen its financial markets to enhance liquidity. A more developed bond market, stock market, and foreign exchange market can maket he Yuan a safe haven for intenational investors. A strong legal system and an effective regulatory framework build foreign investors confidence. China should take steps to enhance transparency, stregthen consumer protection, and improve financial regulations. China can increase the global value of the Yuan. Maintaining economic stability and building a resilient structure against financial crises are crucial. China should manage its macroeconomic policies carefully and implement a reliable monetary policy. These steps can enhance the potential for the yuan to become a strong reserve currency. However, this process may be time- consuming and require the convergence of multiple factors.

Acording to the forecasts, it is anticipated that the United States will experience a decrease in its share of the world GDP and a decrease in the CPI in the coming period. These two factors can be interpreted as signs that the future growth rate of the U.S. economy will slow down, and price increases will ocur in a more controlled manner. Addionally, it is predicted that the share of total reserves within the U.S. GDP will remain at low levels. This implies that the U.S. external reserves will be limited relative to its total economic size. This, in turn, could mean that despite the U.S. being economically strong, the dollar may be used less in international payments or that countries outside the U.S. may hold fewer dollar reserves. Based on these forecasts, it is suggested that even though the United States maintains its economic strength, if its share in the global economy decreases, the value of the dollar may decrease in the future.

In this study, the following conclusions are forecasted regarding the future situation of the German economy, representing the Euro:

- It is predicted that the share of total reserves within Germany's GDP will decrease. This implies that Germany's international reserves will remain at lower levels relative to its economic size. This forecast has indicated that despite Germany's economic strength, its international reserves are expected to decrease.
- A decrease in the CPI rate is expected. This means that CPI in Germany will decrease in a more controlled manner. Decreasing inflation is an indicator of economic stability and demonstrates effective management of economic policies in Germany.

- ❖ It is anticipated that Germany's share in the global economy will continue to remain at low levels. This implies that Germany's share in global trade will be limited. Economic challenges may constrain Germany's influence on the international stage.

In ligth of these forecasts, considering Germany's role within the Eurozone and its economic situation, it is thought that the future strength of the Euro could weaken. However, it is important to note that the likehood of such predictions coming true is subject to various factors, including geopolitical, economic, and financial developments.

According to the forecast results the UK, it is anticipated that the share of total reserves within the country's GDP will decrease, and its share in the global economy will remain at low levels. Addionally, it is predicted that the CPI in the UK will decrease but continune to stay in double digits. Based on these results, it is forecasted that the Sterling's potential to become a strong reserve currency in the future is likely to be weak.

According to the findings of this study, it is predicted that, barring any unforeseen circumstances, the Chinese currency, the yuan, is likely to have a strong reserve currency status. This is indicative of China's potential to further integrate the yuan into the international financial system, thanks to its economic growth and an increasing role in global trade. Despite the hegemonic power of the dollar, the likelihood of losing this power in the future appears plausible. Various factors may influence the future strength of the U.S. economy and the international role of the dollar. This can be linked to factors such as cahanges in the dynamics of the global economy, trade policies, technological developments, and geopolitical factors.

The continuous growth of the Chinese economy, coupled with fundamental issues in the U.S. economy, could strengthen the yuan against the dollar in the future. As seen in the study, the diminishing share of the U.S. economy in the global economy and its insufficient total reserves may eventually erode the dominance of the dollar. Sustained global growth of the Chinese economy and substantial reserves would position the yuan favorably against the dollar in the future in the face of the dollar's hegemony.

Factors such as China's consistent economic growth, its emergence as a significant player in global trade, efforts to increase the international use of the yuan, and its advanced financial infrastructure can potentially lead to the yuan being strong against the dollar, sterlin, and euro. On the other hand, the contraction of the U.S. economy, economic problems and political uncertainties in the Eurozone, and the United Kingdom's high inflation and economic issues are diminishing the strength of these currencies.

The greater acceptance of the Chinese Yuan as a reserve currency could

lead to China becoming the center of international trade, prompting other countries to engage in more trade using the yuan. The recognition of the yuan as a reserve currency could futher enhance China's economic power and increase its influence over international financial institutions. A more diversified range of reserve currency options could enhance financial stability and create a more resilient system against global economic fluctuations. The long-term dominance of the US dollar may weaken, resulting in a reduction of the United States international financial influence.

8. CONFLICT OF INTEREST DECLARATION

There is no conflict of interest among the authors.

9. FINANCIAL SUPPORT

In this study, no funding or support has been utilized.

10. AUTHOR CONTRIBUTIONS

AB: Idea,
AB: Design,
KK: Supervision,
AB: Data collection and/or organization,
AB: Analysis and/or interpretation,
AB: Literature review,
AB: Writing,
KK: Critical review.

11. ETHICAL COMMITTEE DECLARATION AND INTELLECTUAL PROPERTY COPYRIGHT RIGHTS

Ethical committee principles have been adhered to in this study, and necessary permissions have been obtained in accordance with intellectual property and copyright rights principles.

12. REFERENCES

Alp, A., Kılıç, S., & Gönülalçak, H. (2020). An empirical study on the future of reserve currencies. *Journal of Social Sciences, 5(1).*

Aydın, Ö. (2019). *Inflation forecasting with artificial neural networks*. Master's thesis, Beykent University, Institute of Science and Technology, Istanbul.

Bonpasse, M. (2008). The single global currency common cents for the world. Retrieved September, 9, 2023, from http://www.singleglobalcurrency.org/documents/ecopyno15forfreeunlimiteddistribnpdf.

Chin, M., & Frankel, J. (2005). Will the euro eventually surpass the dollar as a leading international reserve currency. *NBER Bureau Economic Research Working Papers, 11* (2), 11-12.

Chinn, M., & Frankel, J. (2005). Will the euro eventually surpass the dollars leading international reserve currency?. *NBER Working Paper Series*, *2(4),* 18.

Cohen, B. (2019). *Monetary rivalry and geopolitical ambition*. USA: The University of Chicago Publications.

Elmas, Ç. (2003). *Artifical neural networks (theory, architecture, training, application)*. İstanbul: Seçkin Publishing, 42.

Erilli, A., Eğrioğlu, E., Yolcu, U., Aladağ, H., & Uslu, R. (2010). Prediction of inflation in Turkey using a hybrid aproach of forward and backward feed artifical neural networks. *Doğuş University Journal, 11 (1),* 29.

Fischer, S. (1993). The role of macroeconomic factors in growth. *NBER Working Paper Series*, *1*, 4.

Haykin, S. (1999). *Neural networks: a comprehensive foundation.* Second Edition, New Jersey: Prentice Hall.

Helleiner, E. (2008). Political determinants of international currencies: what future for the us dollar?. *Review of International Political Economy*, *15 (3),* 14-15.

IMF. (2022). United Kingdom data. Retrieved, September, 2023, from https://www.imf.org/en/Search.

IMF. (2020).Global economic reports. Retrieved, September, 9, 2023, from https://www.imf.org/en/search.

Junoh, M. (2004). Predicting GDP in Malaysia using knowledge-based economy indicators: a comprassion between nural network and econometric aproach. *Sunway Academic Journal, 1,* 39-50.

Krugman, P. R. (1984). The international role of the dollar: theory and prospect. Bilson, J., Martson (ed). *Exchange rate theory and practice* (pp. 261-278). USA: University of Chicago Press.

Li, Y. W. (2018). *China's financial opening coalition politics and policy changes.* New York: Routledge Publishing.

Moore, B. J. (2004). A global currency economy. *Journal of Post Keynesian Economics*, *26 (4),* 635.

Naugthon, B. (2007). *The Chinese economy transitions and growth*. Cambridge: The MIT Press Publishing.

Öztemel, E. (2006). *Artifical neural Networks*. Istanbul: Papatya Publishing, 29-30.

Özyılmaz, A. (2016). The effectiveness of coordination between monetary and fiscal policies on macroeconomic variables. *Balkan and Near Eastern Journal of Social Sciences*,*2,* 28.

Prasad, E. S. (2016). Gaining currency: the rise of Renminbi. US of America, *Oxford University Press,* 158.

Prasad, E. S. (2017). Gaining currency: the rise of Renminbi. US of America, *Oxford University Press*, 114-127.

Richardson, D. (2016). Guide to China-Hong Kong stock coonect. Retrieved, September, 9, 2023 https://www.dorsey.com//media/files/asiapacific/dorsey_guide_hk_stock_connect_china_equity_market.pdf?la=en.

Rozhentsova, E. (2012). Alternative international currencies. *Economic Annals, 57 (5),* 32-33.

Seyidoğlu, H. (2003). *International economics: theory, policy, and practice*. Istanbul: Güzem Can Publishing.

Subramanian, A. (2011). Renminbi rules: the conditional imminence of the reserve currency transition. *Peterson Institute for International Economics Working Paper*, *1*, 4-6.

Tatlıyer, M. (2019). What will replace the dollar in a multipolar world. *SETA, 1(2),* 12.

TCMB. (2019). 100 questions on central banking. Retrieved, September, 9, 2023 https://www.tcmb.gov.tr.

Tektaş, A., & Karataş, A. (2004). Application of artifical neural networks to finance: stock price prediction. *Atatürk Univesity Journal of Economics and Administrative Sciences*, *18 (4),* 14.

Tkacz, G. (2011). Neural network forecasting of Canadian GDP growth. *International Journal of Forecasting, 17 (1),* 38-42.

World Bank. (2022). Data. Retrieved, September, 9, 2023, from https://databank.worldbank.org/.

Wu, J., Yingli, P., & Zhu, Q. (2014). The conditions and potential of rmb as an international reserve: the empirical evidences from the history of eight major international reserve currencies. *China Finance Review International, 4 (2).*

Yurtoğlu, B. (2005). Founding family effects on business group growth*:* longitudinal evidence from Turkey. *Long range Planing*, *51 (6),* 26.

Yüksek, A. G. (2007). *Comparison of multiple regression analysis and artifical neural networks in air pollution prediction.* Doctoral dissertation, Graduate Scholl of Social Sciences, Cumhuriyet University, Sivas, 11.

Zhang, S., & Chen, C. (2009). Township and village enterprises in China's sustainable development in China. *Area Studies-China, Regional Sustainable Development Review,3,* 18-19.