

# Estimation of the National Income Function (United States and China): A Comparative Study for the Period (2000-2019)

Loma Abbas Al-Khafaji\*

Department of Administration and Economics, AL-Muthanna University

\* Correspondence: [lmmybas443@gmail.com](mailto:lmmybas443@gmail.com)

**Abstract:** The research aims to analyze the national income function of the United States and China, considering them the most influential countries in the trade system. It also analyzes the factors behind the development of the Chinese economy over the past few decades. A time series of national income variables for both countries, spanning from 2000 to 2019, was reviewed. The researchers constructed a linear model to estimate both functions using the linear model. The research concluded that China's commercial dominance on the international stage is the result of several factors, including China's implementation of a planned market economy that combines the advantages of capitalism and socialism, as well as the Chinese government's complete control over economic management. Additionally, the flexibility of China's production system and its response to the devaluation of the local currency, the yuan, played a role. However, despite this, the dominance of the U.S. economy in international economic activity remains paramount due to the vast scale of economic operations and activities conducted by the United States.

**Keywords:** National income function, linear regression models, U.S. and Chinese economy

## Introduction

The United States has dominated the global economy for more than seventy years, relying on free industries and investments, and attracting massive capital inflows. Additionally, it benefits from its currency, the dollar, which is considered an international standard currency. By 2023, the U.S. accounted for approximately 26.3% of global production. However, this commercial dominance has begun to show a trade deficit, particularly due to the increased commercial competition from East Asian countries, especially the Chinese giant, which holds about 17% of total global trade.

Looking back at China's recent history, particularly in 1978 when Deng Xiaoping came to power, his policies that combined capitalism and socialism under the term "planned market economy" astonished the world. These policies encouraged foreign investments in China, which were previously considered a crime due to the strict adherence to the communist socialist principles upheld by the late Chinese President Mao Zedong. China's economic rise has amazed the world, and Deng Xiaoping's prediction that China would be among the advanced nations within 25 years had a significant impact on Chinese policy. This continuous economic

**Citation:** Loma Abbas Al-Khafaji. Estimation of the National Income Function (United States and China): A Comparative Study for the Period (2000-2019). International Journal on Economics, Finance and Sustainable Development (IJEFSFD) 2024, 6(5), 302-316.

Received: 11<sup>th</sup> Mar 2024

Revised: 16<sup>th</sup> Apr 2024

Accepted: 19<sup>th</sup> May 2024

Published: 30<sup>th</sup> Jun 2024



**Copyright:** © 2024 by the authors. Submitted for open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>)

growth has elevated China's status as a key trade partner in global commerce, reflected in repeated trade surpluses, while the U.S. has faced a continuous trade deficit.

This situation has raised concerns in the United States, which strives to maintain its leading and influential position in the international system, especially with China's entry into competition with major international powers in areas such as space, cyber warfare, and the production of advanced and strategic weapons. China's success in establishing a transcontinental international economic network further exemplifies its growing power.

The growth of the Chinese economy can be attributed to the ability of its markets, particularly the labor market, to respond to the currency wars it wages against its international trading partners. China's monetary policy frequently devalues its currency, the yuan, according to its economic indicators, which lowers the costs of Chinese industries. This devaluation is effective due to the labor market's adaptation to lower real incomes, which other trading partners struggle to match. Thus, in this research, we will economically analyze the U.S.-China national income function to track the economic developments of the function's variables.

### **Materials and Methods**

Numerous reference studies have addressed the economic transformations in global trade and the rise of China as an economic superpower amidst the declining growth of U.S. foreign trade. We will review some of these studies.

The study titled "The Chinese-American Economic War in the Trump Era"(1) by researcher Nazir Mahmoud Jalikhani highlights the rapid rise of the Chinese economy and the factors behind its success, presenting a historical sequence of events and factors that led to China's economic rise amidst the declining growth of U.S. international trade. The researcher concluded that cultural and social factors of Chinese society played a fundamental role in the rise of the Chinese economy, alongside China's trade relations with various countries and major alliances with key players in international trade.

In contrast, Hamid Al-Jamili's study "Elements of Strength and Weakness in the American Economy with a Special Reference to American Debt"(2) aimed to analyze the strength of the U.S. economy, being the

world's largest in terms of GDP and a significant contributor to financial markets, as well as the dominance of the U.S. dollar as a trade standard and global reserve currency. The study also focused on the main weaknesses of the U.S. economy, including high debt levels, decreased demand for American technology, and the dependency of U.S. industry on exporting military equipment, or what is known as the U.S.-Russian arms race, which has negatively impacted U.S. foreign trade indicators.

**\*\*Additionally,** the study by researcher Ahmed Farouk Abbas titled "The Development Experience in China – Reality and Challenges"(3) aimed to analyze the factors that led to the rise of the Chinese economy, especially after 1978, and the key foundations of this experience in the context of international competition. The researcher concluded that the Chinese experience went through two phases: the first phase (1949-1978), during which the teachings of socialist-Marxist economics were applied, resulting in some tangible progress; and the second phase (1978 onwards), which saw China opening up to the outside world through the adoption of a planned market economy, combining the advantages of capitalism and socialism, marking the true launch of the Chinese economy.

Dr. Mohammed Muthar Saleh's study, "Evaluation of the Economic Disparity Between the U.S. Trade Deficit and the Chinese Trade Surplus," (4)evaluated the determinants and potentials of the U.S. external trade deficit and the Chinese trade surplus in the context of exchange rate and interest rate fluctuations. The researcher concluded that balancing the trade deficit and surplus areas is essential for achieving global harmony and peace, promoting the concept of fair globalization.

## **\*\*2- The Concept of the National Income Function and International Trade\*\***

International trade is of immense importance as it is one of the most vital sectors for any economic community, whether advanced or developing. Foreign trade links countries and communities together and helps expand marketing capacity by opening new markets for a country's products. It also increases national welfare by broadening the range of choices for consumption, investment, and overall allocation of productive resources. Furthermore, it serves as a crucial indicator of a country's productive capacity and competitiveness in the international market, as its indicators are related to available productive capabilities, export capacity, export revenues, import capacity, and the impact on a country's foreign currency reserves, thereby affecting the trade balance. There are also close

relationships between foreign trade and economic development, which result in higher national income levels, affecting the volume and pattern of international trade<sup>(5)</sup>. Changes in international trade conditions directly influence the structure and level of national income. International trade theories focus on analyzing the foundations of trade and addressing the most pressing question: why does trade occur between countries? They explore historical literature that has attempted to answer this question. Another key question is: what is the gain from international trade, and how is this gain distributed? on the terms of trade, thereby determining the rate of international exchange. On the other hand, the analysis of trade policy examines the reasons why countries impose restrictions on their international economic transactions, such as tariffs and import quotas, and their impact on the balance of international payments and the overall welfare of society. It also considers the global trend towards protectionism and its effect on the economies of various countries amidst intense international competition.

International trade is defined as all import and export operations conducted by a country, whether visible or invisible<sup>(6)</sup>. It encompasses the commercial exchange activities of goods and services between different countries to achieve mutual benefits, distinguishing it from domestic trade that occurs within the borders of a specific country<sup>(7)</sup>.

International trade is also defined as the exchange of goods and services between countries, as well as between companies and individuals at the international level. More broadly, it can be described as the system of commodity and monetary relations comprising the total external trade of all countries worldwide. It can be conducted by ordinary individuals, legal entities, governments, and various international companies on a global scale<sup>(8)</sup>.

## **Results and Discussion**

### **\*\*1- Analysis of the U.S. National Income Function\*\***

The United States is distinguished by having the strongest economy in the world, one that numerous trade alliances have not been able to rival. The primary reason for its economic power lies in its liberalism or reliance on a free-market economy based on free investment and commercial competition. The U.S. is the world's leading nation in terms of gross national product (GNP), which reached approximately \$14.072 trillion in

2006, equivalent to 30% of the global GNP(9). Additionally, the U.S. economic growth rate was around 3.2% in 2007.

Looking back at the historical trajectory of the U.S. economy, particularly after the end of World War II in 1945, the United States adopted a financial strategy aimed at reintegrating the global economy by imposing a form of the international monetary system and asserting its influence at the Bretton Woods Conference. During this conference, it established several key institutions for the international economic system, such as the International Monetary Fund (IMF), the World Bank, and the General Agreement on Tariffs and Trade (GATT). At the same time, it ensured its dominance over these international institutions to serve its economic interests.

What helped solidify this strategy was that these institutions, which control the international economy, tend to embody the principles of a liberal free market, aligning significantly with the tendencies and orientations of American society and the American liberal ideology. Despite economic considerations being the main focus in decision-making within these organizations, the United States has often managed to base the decisions of these organizations on political considerations to serve its broader interests and to confront countries with policies contrary to those of the U.S. For instance, the U.S. prevented aid to Chile between 1971-1973, and the World Bank refused any aid to Vietnam in 1979

Additionally, the strength of the United States in managing these organizations stems from its voting power, holding approximately 17.73% of the total votes in the World Bank, compared to Japan's 6.18%, even though Japan has the second-largest share in the bank. To understand the strength and size of the U.S. economy(10), we refer to the data in the following table:

**\*\*Table (1) Variables of the U.S. National Income Function\*\*** (Billion current U.S. dollars)

**\*\*Source:\*\*** World Bank, World Development Indicators, United States, various years. Available at [link]

<https://data.albankaldawli.org/country/united-states?view=chart>

| years | Y      | G.R  | C     | G.R  | G     | G.R  | I     | G.R   | X     | G.R   | M     | G.R   |
|-------|--------|------|-------|------|-------|------|-------|-------|-------|-------|-------|-------|
| 2000  | 10.38  |      | 6.762 |      | 1.437 |      | 2.804 |       | 1.096 |       | 1.452 |       |
| 2001  | 10.743 | 0.03 | 7.065 | 0.04 | 1.537 | 0.06 | 2.692 | -0.04 | 1.024 | -0.06 | 1.375 | -0.05 |
| 2002  | 11.054 | 0.02 | 7.342 | 0.03 | 1.645 | 0.06 | 2.705 | 0.00  | 0.998 | -0.02 | 1.406 | 0.02  |
| 2003  | 11.53  | 0.04 | 7.723 | 0.05 | 1.746 | 0.05 | 2.816 | 0.04  | 1.036 | 0.03  | 1.524 | 0.08  |
| 2004  | 12.313 | 0.06 | 8.212 | 0.06 | 1.852 | 0.05 | 3.037 | 0.07  | 1.17  | 0.12  | 1.778 | 0.15  |
| 2005  | 13.169 | 0.06 | 8.747 | 0.06 | 1.962 | 0.05 | 3.207 | 0.05  | 1.305 | 0.10  | 2.008 | 0.12  |

|      |        |       |         |       |       |      |       |       |       |       |       |       |
|------|--------|-------|---------|-------|-------|------|-------|-------|-------|-------|-------|-------|
| 2006 | 14.072 | 0.06  | 9.26    | 0.05  | 2.073 | 0.05 | 3.305 | 0.03  | 1.472 | 0.12  | 2.227 | 0.10  |
| 2007 | 14.543 | 0.03  | 9.706   | 0.04  | 2.198 | 0.05 | 3.252 | -0.01 | 1.66  | 0.12  | 2.371 | 0.06  |
| 2008 | 14.684 | 0.009 | 9.976   | 0.02  | 2.352 | 0.06 | 3.05  | -0.06 | 1.837 | 0.10  | 2.561 | 0.07  |
| 2009 | 14.398 | -0.01 | 9.842   | -0.01 | 2.43  | 0.03 | 2.543 | -0.1  | 1.581 | -0.15 | 1.987 | -0.25 |
| 2010 | 15.126 | 0.04  | 10.185  | 0.03  | 2.51  | 0.03 | 2.809 | 0.09  | 1.846 | 0.15  | 2.375 | 0.17  |
| 2011 | 15.832 | 0.04  | 10.6411 | 0.04  | 2.511 | 0.00 | 2.928 | 0.04  | 2.102 | 0.12  | 2.698 | 0.12  |
| 2012 | 16.67  | 0.05  | 11.006  | 0.03  | 2.515 | 0.00 | 3.152 | 0.07  | 2.191 | 0.04  | 2.773 | 0.02  |
| 2013 | 17.175 | 0.02  | 11.317  | 0.02  | 2.532 | 0.00 | 3.3   | 0.04  | 2.273 | 0.03  | 2.76  | -0.00 |
| 2014 | 18.057 | 0.05  | 11.822  | 0.04  | 2.565 | 0.01 | 3.445 | 0.04  | 2.371 | 0.04  | 2.876 | 0.04  |
| 2015 | 18.704 | 0.03  | 12.297  | 0.03  | 2.607 | 0.01 | 3.618 | 0.04  | 2.265 | -0.04 | 2.771 | -0.03 |
| 2016 | 19.045 | 0.01  | 12.769  | 0.03  | 2.66  | 0.02 | 3.585 | -0.00 | 2.227 | -0.01 | 2.719 | -0.01 |
| 2017 | 19.83  | 0.04  | 13.34   | 0.04  | 2.742 | 0.03 | 3.704 | 0.03  | 2.374 | 0.06  | 2.901 | 0.06  |
| 2018 | 20.837 | 0.04  | 13.993  | 0.04  | 2.891 | 0.05 | 3.917 | 0.05  | 2.528 | 0.06  | 3.119 | 0.07  |
| 2019 | 21.69  | 0.04  | 14.544  | 0.03  | 2.995 | 0.03 | 4.001 | 0.02  | 2.514 | -0.00 | 3.105 | -0.00 |

From the data in Table (1), we observe the upward trend in national income values. The total national income was \$10.38 trillion in 2000, rising to \$15.126 trillion in 2010 with a growth rate of 4%. This upward trend continued until 2019, when the national income reached \$21.69 trillion, maintaining a growth rate of 4%.

Regarding total consumption values, which registered the highest share of the national income, we note a steady increase during the period under review. Total consumption was \$6.762 trillion in 2000, rising to \$10.185 trillion in 2010 with a growth rate of 3%, and continued to increase, reaching \$14.544 trillion in 2019 with a growth rate of 3%.

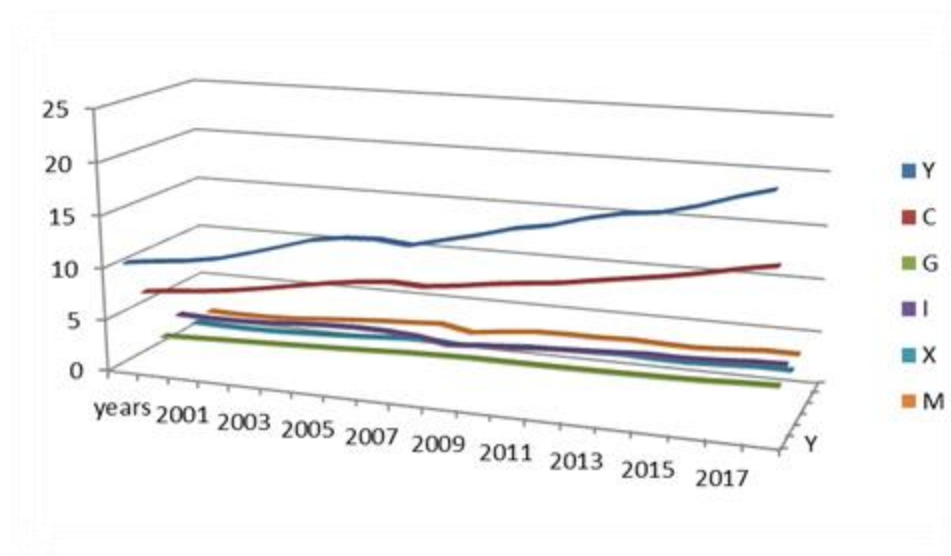
National expenditure also showed an increase during the period under review, albeit with fluctuating growth rates. Expenditure was \$1.437 trillion in 2000, rising to \$2.51 trillion in 2010 with a growth rate of 3%, and reaching approximately \$3 trillion in 2019 with a growth rate of 3%. This increase in U.S. public expenditure is linked to heightened competition in the U.S.-Russia military race and increased allocations for space sciences.

Regarding total U.S. investments, which characterize the nature of the U.S. economy, total investment returns remained between \$3-4 trillion. In 2019, total investment was \$4 trillion, reflecting the large scale of U.S. investments. Total export revenues also experienced significant expansion, with export revenues of about \$2 trillion in 2000, increasing to \$1.846 trillion in 2010 with a growth rate of 15%, and continuing to rise to \$2.514 trillion in 2019.

In terms of imports, the U.S. economy imports raw materials and electronics, especially from Chinese companies, which are integral to various industries. Imports amounted to \$1.452 trillion in 2000, rising to

\$2.375 trillion in 2010 with a growth rate of 17%, and further increasing to \$3.105 trillion in 2019.

U.S. Commerce Secretary Carlos Gutierrez attributed the growth in U.S. exports to free trade agreements, stating, "Although countries in free trade agreements account for only 7.3% of the world's total GDP, exports to those countries make up 42.5% of U.S. exports."



**\*\*Figure (1) Variables of the U.S. National Income Function\*\***

**\*\*Source:\*\*** World Bank, World Development Indicators, United States, various years. Available at [link]

- The figure was prepared by the researcher based on the data from Table (1).

## 2- Analysis of Chinese National Income Variables

The Chinese economy has witnessed tremendous growth over the past three decades, but an important shift in growth pattern occurred during the global financial crisis. However, the Chinese economy has been able to absorb financial crises because of its high investment rates, with investments accounting for about 41.5% of the Gross Domestic Product (GDP). These investments have led to an increase in housing, manufacturing capacity, and infrastructure such as roads and railways. The current account surplus rose to more than 10% of GDP. In the six years following the global crisis, the external surplus decreased to between 2% and 3% of GDP. Each sharp decline was accompanied by an increase in investment, resulting in a reduction in overall demand of almost 50% of GDP in recent years.

The growth has been impressive compared to the rest of the world, but what was astonishing was that the growth rate slowed to less than 8%, which is more than 3 percentage points lower than the pre-crisis period. Consequently, China has recently resorted to much higher investments to grow larger than in the past. This growth pattern reveals three problems. The first problem is the slowdown in technological progress, measured by the growth of total factor productivity. Total factor productivity measures the volume of output obtained, and secondly, the decline in the marginal output of capital requires more and more investment to achieve higher growth. The actual indicators of this decline in capital productivity are manifested in vacant residential apartments, unused airports, and idle factories in important manufacturing sectors such as steel - excessive investments generate little added value to GDP, especially household consumption, which declined and constituted only about 34% of GDP.

The experiences of Japan, Korea, and the Chinese province of Taiwan provide some useful historical guidance on the current stage of development in China. When these economies were at this level of per capita GDP share, in the 1970s and 1980s, their investments accounted for 35% of the world's total by global standards, and the economies of Asian countries were witnessing production growth, so they were growing at the same rate as China now, but with less capital. These countries tended to have a current account deficit at that stage of development, moving to a decline in investment and a gradual decline in returns on capital, and from there gradually shifted from deficit to surplus in the trade balance. The average consumption rate of household living standards in that stage was about 52%, 18% higher than the current rate in China. However, Chinese leaders are aware that the country faces a challenge and they must rebalance by reducing the investment rate and stimulating consumption at the same time. The third session presented a series of reforms to stimulate innovation, curb excessive investments, increase household income, and consumption(11).

Several factors have contributed to the rise of the Chinese economy, the most important of which are:

- 1- Unemployment wages: The labor market in China responds to prevailing wage levels, given its large population. This situation has led to an increase in profit margins and attracted foreign direct investment from American, European, and Japanese companies.

- 2- Female participation in the workforce: The workforce in China is characterized by a higher female participation rate than the average in the manufacturing industry. China's one-child policy has led to women participating in childcare for a shorter period, enabling them to enter the labor market.
- 3- Political System: The implementation of planned economic policy has led to state control over economic activity and thus control over decision-making processes. Since 1953, the government has followed a series of five-year plans, reflecting China's transition to a socialist market economy, during which it has been able to enact any necessary reforms.
- 4- Strong Leadership: Strong leadership by the head of state is a crucial factor in economic success, especially as China began to move away from centralized authority in decision-making and planning since 1978.
- 5- Export-Led Growth: Implementing import substitution strategy in addition to re-manufacturing policy.
- 6-The response of the production apparatus to the mechanism of devaluing the local currency, the yuan, as well as the response of the labor market to the decrease in their real incomes(12). To understand the variables of the Chinese economy, we rely on the data in Table 2.

**Table (2)** Variables of the Chinese National Income Function (Billion current U.S. dollars)

Source: The World Bank, World Development Indicators, for China, available on the international information network at the following link: [link] <https://data.albankaldawli.org/country/china?view=chart>

| years | Y      | G.R  | C     | G.R  | G     | G.R  | I     | G.R   | X     | G.r   | M     | G.R   |
|-------|--------|------|-------|------|-------|------|-------|-------|-------|-------|-------|-------|
| 2000  | 1.196  | -    | 0.566 | -    | 0.203 | -    | 0.406 | -     | 0.253 | -     | 0.224 | -     |
| 2001  | 1.32   | 0.09 | 0.609 | 0.07 | 0.219 | 0.07 | 0.476 | 0.15  | 0.272 | 0.07  | 0.243 | 0.08  |
| 2002  | 1.455  | 0.09 | 0.66  | 0.08 | 0.236 | 0.07 | 0.531 | 0.10  | 0.333 | 0.20  | 0.295 | 0.19  |
| 2003  | 1.65   | 0.12 | 0.709 | 0.07 | 0.254 | 0.07 | 0.657 | 0.21  | 0.447 | 0.29  | 0.412 | 0.33  |
| 2004  | 1.95   | 0.16 | 0.794 | 0.11 | 0.285 | 0.11 | 0.818 | 0.21  | 0.607 | 0.30  | 0.556 | 0.29  |
| 2005  | 2.269  | 0.15 | 0.904 | 0.12 | 0.338 | 0.17 | 0.922 | 0.11  | 0.773 | 0.24  | 0.648 | 0.15  |
| 2006  | 2.746  | 0.19 | 1.038 | 0.13 | 0.407 | 0.18 | 1.098 | 0.17  | 0.991 | 0.24  | 0.782 | 0.18  |
| 2007  | 3.558  | 0.25 | 1.291 | 0.21 | 0.519 | 0.24 | 1.437 | 0.26  | 1.258 | 0.23  | 0.95  | 0.19  |
| 2008  | 4.622  | 0.26 | 1.621 | 0.22 | 0.665 | 0.24 | 1.941 | 0.30  | 1.497 | 0.17  | 1.149 | 0.19  |
| 2009  | 5.093  | 0.09 | 1.802 | 0.10 | 0.752 | 0.12 | 2.313 | 0.17  | 1.262 | -0.17 | 1.042 | -0.09 |
| 2010  | 6.061  | 0.17 | 2.089 | 0.14 | 0.887 | 0.16 | 2.833 | 0.20  | 1.65  | 0.26  | 1.432 | 0.31  |
| 2011  | 7.481  | 0.21 | 2.637 | 0.23 | 1.15  | 0.25 | 3.523 | 0.21  | 2.006 | 0.19  | 1.825 | 0.24  |
| 2012  | 8.512  | 0.12 | 3.019 | 0.13 | 1.344 | 0.15 | 3.944 | 0.11  | 2.175 | 0.08  | 1.943 | 0.06  |
| 2013  | 9.492  | 0.10 | 3.429 | 0.12 | 1.52  | 0.12 | 4.44  | 0.11  | 2.354 | 0.07  | 2.119 | 0.08  |
| 2014  | 10.488 | 0.09 | 3.845 | 0.11 | 1.656 | 0.08 | 4.8   | 0.07  | 2.46  | 0.04  | 2.241 | 0.05  |
| 2015  | 11.019 | 0.04 | 4.178 | 0.08 | 1.793 | 0.07 | 4.782 | -0.00 | 2.362 | -0.04 | 2.003 | -0.11 |
| 2016  | 11.188 | 0.01 | 4.344 | 0.03 | 1.838 | 0.02 | 4.788 | 0.00  | 2.199 | -0.07 | 1.944 | -0.02 |
| 2017  | 12.3   | 0.09 | 4.744 | 0.08 | 2.009 | 0.08 | 5.295 | 0.10  | 2.424 | 0.09  | 2.208 | 0.12  |
| 2018  | 13.819 | 0.11 | 5.352 | 0.12 | 2.297 | 0.13 | 6.085 | 0.13  | 2.655 | 0.0   | 2.548 | 0.14  |

|      |        |       |       |      |       |      |       |       |      |        |       |       |
|------|--------|-------|-------|------|-------|------|-------|-------|------|--------|-------|-------|
| 2019 | 11.960 | -0.14 | 5.585 | 0.04 | 2.397 | 0.04 | 6.204 | 0.019 | 2.64 | -0.005 | 2.476 | -0.02 |
|------|--------|-------|-------|------|-------|------|-------|-------|------|--------|-------|-------|

From the data in Table 2, we observe that the total Chinese national income has taken an upward trajectory over the period under consideration, reflecting significant progress in the Chinese economy. The total national income reached around \$1.196 trillion USD in 2000, rising to \$6.061 trillion USD with a growth rate of 17% in 2010. Subsequently, the total national income continued to increase, reaching \$11.960 trillion USD with a slightly declining growth rate of 14% in 2019.

Similarly, total national consumption in China also witnessed clear progress. It amounted to \$566 billion USD in 2000, increasing to \$2.089 trillion USD with a growth rate of 14% in 2010, as a result of consumption encouragement policies pursued by China at that time. Total consumption then continued to rise, reaching \$5.585 trillion USD in 2019 with a growth rate of 4%.

Regarding total public expenditure, it experienced an increase but remained lower than total consumption. This can be attributed to China's entry into the space world, expansion in supporting technological and electronic industries, and planned market expansion. In 2000, total public expenditure amounted to \$203 billion USD, rising to \$887 billion USD with a growth rate of 16% in 2010. It continued to increase thereafter, reaching \$2.397 trillion USD in 2019 with a growth rate of 4%.

Looking at total investments, China witnessed significant expansion both domestically and internationally, yet it still falls far behind the massive scale of American investments. Even in terms of other national income variables, the United States maintains a significant lead. Referring back to the data in Table 2, we note that total investment amounted to \$406 billion USD in 2000, rising to \$6.204 trillion USD in 2019 with a growth rate of 1% over the previous year.

Furthermore, examining total exports and imports, we observe from the data in the table that China maintains a balance in its external sector operations. Total exports amounted to \$2.64 trillion USD in 2019, with total imports reaching \$2.476 trillion USD for the same year.

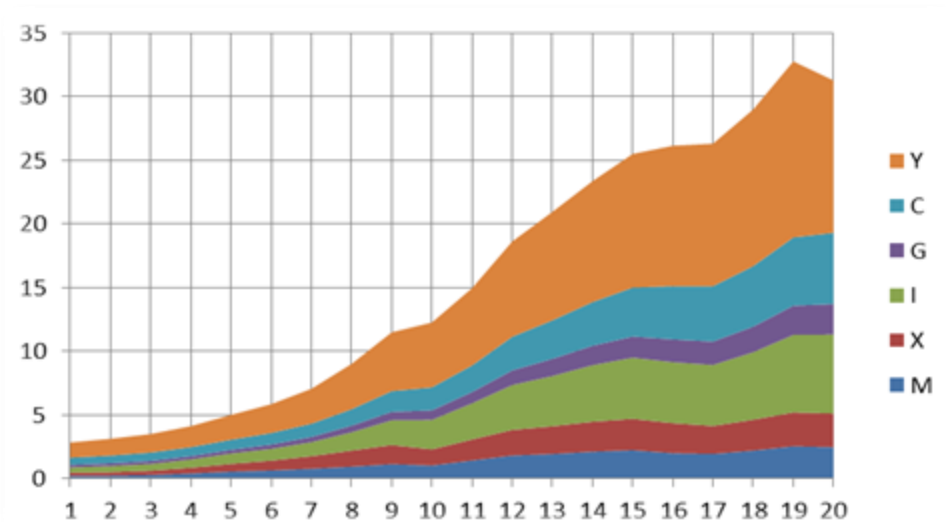


Figure 2. Variables of the Chinese National Income Function

The figure was prepared by the researcher based on the data from Table 2.

#### 1- Measuring the National Income Function for the United States

In this section, the growth model variables were identified to measure the national income function for both countries in order to compare the economic variables' impacts on national income for each. After inputting the values into the statistical program E-Views 10, the following results were obtained regarding the U.S. economy:

The above results indicated the high capability of the model to explain the changes occurring in the national income as a dependent variable, due to the influence of the independent variables represented by the national income function. The parameter signs were consistent with the logic of economic theory, as consumption was positively correlated with national income. An increase in consumption (demand side) would stimulate production, thus reflecting an increase in the value of national income by a parameter of 0.81. Government spending, on the other hand, was negatively correlated, indicating that U.S. government spending is directed towards supporting defense and space programs, thus negatively affecting national income by a parameter of -1.61. Looking at investment, it showed a strong positive correlation, along with total exports, making them the most influential variables on national income. Meanwhile, total imports were negatively correlated with national income, as per economic theory,

indicating that an increase in imports would lead to a decrease in national income by a parameter of -1.52.

$$\begin{aligned}
 Y &= -1.85 + 0.816C - 1.61G + 1.55I + 2.13X - 1.52M \\
 se. & \quad 0.685 \quad 0.173 \quad 0.689 \quad 0.380 \quad 0.424 \quad 0.456 \\
 t & \quad (-2.69)^{1\%} \quad (4.72)^{1\%} \quad (2.33)^{1\%} \quad (4.09)^{1\%} \quad (5.02)^{1\%} \quad (-3.34)^{1\%} \\
 P & \quad 0.01 \quad 0.000 \quad 0.03 \quad 0.000 \quad 0.000 \quad 0.000 \\
 SE &= 0.0942 \quad R^2 = 99.9\% \quad \bar{R}^2 = 99.9\% \quad F_{(6,20)} = 5605^{1\%} \quad D.W = (1.886)^{1\%} \\
 F_{-table(5,15)} & 0.01 = 4.56 \quad du = 0.515 < 1.886 < du = 1.918 \\
 t_{-table} 0.01 &= 2.624, t_{-table} 0.05 = 1.761
 \end{aligned}$$

Considering the statistical tests, the model passed all tests with high significance for both the t-test and the F-test, as their computed values exceeded their tabulated values, indicating the significance of the relationships. Regarding the R-squared test, it indicated a high explanatory power of the model, as it explained 99.9% of the variance in the dependent variable. As for the test for autocorrelation between the residual errors, represented by the Durbin-Watson test, the results indicated no autocorrelation as the computed value fell within the non-rejection region between the upper and lower table limits.

#### 1- Estimating the National Income Function for China

The results of estimating the Chinese national income function provided parameter signs consistent with economic theory and high statistical significance. According to the following results:

$$\begin{aligned}
 Y &= -0.08 + 1.67C - 0.82G + 1.08I + 0.96X - 0.91M \\
 se. & \quad 0.035 \quad 0.216 \quad 0.611 \quad 0.093 \quad 0.099 \quad 0.166 \\
 t & \quad (-2.35)^{1\%} \quad (7.72)^{1\%} \quad (-1.35)^{1\%} \quad (11.62)^{1\%} \quad (9.71)^{1\%} \quad (-5.47)^{1\%} \\
 P & \quad 0.03 \quad 0.000 \quad 0.19 \quad 0.000 \quad 0.000 \quad 0.000 \\
 SE &= 0.0337 \quad R^2 = 100\% \quad \bar{R}^2 = 100\% \quad F_{(6,20)} = 6854^{1\%} \quad D.W = (1.532)^{1\%} \\
 F_{-table(5,15)} & 0.01 = 4.56 \quad du = 0.515 < 1.532 < du = 1.918 \\
 t_{-table} 0.01 &= 2.624, t_{-table} 0.05 = 1.761
 \end{aligned}$$

The above results indicate that total consumption, investment, and exports are positively correlated with national income, while government spending and total imports are inversely related. The statistical tests were significant in explaining the relationship between the independent variables and the dependent variable. Both the t-test and the F-test showed that the computed values exceeded the tabulated values, indicating the acceptance of the alternative hypothesis and the rejection of the null

hypothesis, thus affirming the significance of the estimated model. As for the test for autocorrelation, the results suggested no autocorrelation, as the computed value of the Durbin-Watson test fell between the lower and upper bounds of the tabulated values.

### Conclusion

Over the past two decades, international trade competition has intensified between the two major poles, the United States and China, especially as the economic status of Japan, the European Union, and Russia declined. This led to China's surpassing the United States by achieving financial surpluses in its balance of payments, while the United States experienced a persistent deficit. However, China's recurrent surpluses do not necessarily reflect the superiority of the Chinese economy over the American economy. Data indicate the massive size of the American national income, investments, and exports, which exceed the capacity of the Chinese national income by multiple times. Moreover, the Chinese economy is more resilient in simulating external shocks, especially with its exceptional ability to manipulate its local currency's value and respond to changes in the labor market. This is unlike the United States, which cannot resort to currency wars. Competitive warfare does not serve the interests of either party, especially within the international trade system. Therefore, there is a need to find a kind of trade understanding to achieve the principles of global trade and thus reach a fair international trade system.

### References

1. Nadhir Mohammed Jalikhan, "The Chinese-American Economic War," *International Politics Journal*, Issue 46, 2021.
2. Dr. Hamid Al-Jumaili, "Elements of American Economic Strength and Weakness with Special Reference to American Debt," *Al-Muntada Journal*, Vol. 28, Issue 258, 2013.
3. Dr. Ahmed Farouk Abbas, "The Developmental Experience in China - Realities and Challenges," *Scientific Journal of Economics and Commerce*, 2019.
4. Dr. Mudher Mohammed Saleh, "Evaluation of Economic Disparity Limits Between the U.S. Trade Deficit and the Chinese Trade Surplus: An Economic Analytical Vision," *Central Bank of Iraq*, 2011.

5. Jamal Jwaidan Al-Jamal, "International Trade," Academic Book Center, Amman, Jordan, 2010, pp. 12-13.
6. Dr. Miranda Zaghlool Rizk, "International Trade," Open Learning Center Benha, 2010, p. 5.
7. "Foreign Trade," Institute of Banking Studies, Kuwait, Eighth Series - Issue 1, 2016, p. 2.
8. Sheikh Hafidha, "Rationalization of Trade Policies for the Positive Integration of Algeria into the Global Economy - World Trade Organization," University of Oran, 2012, p. 3.
9. Iyad Abdul Kareem Majid, "U.S. Foreign Policy Towards West Africa After the Cold War - Nigeria as a Model," Ph.D. Thesis, Al-Nahrain University, College of Political Science, 2008, p. 107.
10. Salim Kati Ali, "The Elements of American Power and Their Impact on the World Order," International Studies Journal, Issue 42, 2017, p. 157.
11. "The Chinese Transformation," World Bank Publications, June 2014, p. 11.
12. Zawawi Zakia, Smouk Nawal, "Readings in the Light of Economic and Developmental Strategy - The Chinese Experience as a Model," Al-Ibdaa Journal, Vol. 12, Issue 1, 2022, p. 89.
13. Alimi, R. S. (2015). *Estimating consumption function under permanent income hypothesis: a comparison between Nigeria and South Africa*. mpra.ub.uni-muenchen.de. <https://mpira.ub.uni-muenchen.de/id/eprint/65787>
14. Cadil, J., Vltavska, K., Krejčí, I., Hartman, D., & ... (2017). Aggregate production function and income identity–Empirical analysis. *International Journal of ...* <https://www.academia.edu/download/108306254/dcc3837f9943473b749c4700a02fdbf37118.pdf>
15. Daka, L., Fandamu, H., & Sumbye, K. (2016). Estimation of the consumption function under the permanent income hypothesis: Evidence from Zambia. *International Journal of ...* [https://www.researchgate.net/profile/Lincoln-Daka/publication/316622353\\_Estimation\\_of\\_the\\_consumption\\_function\\_under\\_the\\_permanent\\_income\\_hypothesis\\_Evidence\\_from\\_Zambia/links/59bd70d8aca272aff2da1256/Estimation-of-the-consumption-function-under-the-permanent-income-hypothesis-Evidence-from-Zambia.pdf](https://www.researchgate.net/profile/Lincoln-Daka/publication/316622353_Estimation_of_the_consumption_function_under_the_permanent_income_hypothesis_Evidence_from_Zambia/links/59bd70d8aca272aff2da1256/Estimation-of-the-consumption-function-under-the-permanent-income-hypothesis-Evidence-from-Zambia.pdf)
16. Decker, A. L., Duncan, K., Finn, A. S., & Mabbott, D. J. (2020). Children's family income is associated with cognitive function and volume of anterior not posterior hippocampus. *Nature Communications*. <https://www.nature.com/articles/s41467-020-17854-6>
17. Dunn, L. F. (1978). An empirical indifference function for income and leisure. *The Review of Economics and Statistics*. <https://www.jstor.org/stable/1924245>
18. Elwakshi, M., & Al-Qudah, A. (2013). Consumption function under the permanent income hypothesis in selected Arab countries. *Proceedings of AICS-Social Sciences*. <https://jurnal.usk.ac.id/AICS-Social/article/view/6151>
19. Farahanifard, S. (2018). The Economical Function of the Religion of Islam (the distribution of wealth and income). *Qabasat*. [https://qabasat.iict.ac.ir/article\\_30426\\_en.html](https://qabasat.iict.ac.ir/article_30426_en.html)
20. Kelikume, I., Alabi, F., & Anetor, F. (2017). Nigeria consumption function–an empirical test of the permanent income hypothesis. *Journal of Global Economics ...* [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2977193](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2977193)
21. Kingma, D., & Oskam, A. J. (1987). *Measuring income disparities between (and within) farm households and non-farm households by means of the individual welfare function of income*. cabidigitallibrary.org. <https://doi.org/10.5555/19881854972>

22. Monroe, R. (1965). *An analytical comparison of various concepts of business income affecting the accounting function of income determination.* krex.k-state.edu. <https://krex.k-state.edu/bitstream/handle/2097/23541/LD2668R41965M753.pdf?sequence=1>
23. Musgrove, P. (1980). Income distribution and the aggregate consumption function. *Journal of Political Economy*. <https://doi.org/10.1086/260883>
24. Praag, B. M. S. Van, & Kapteyn, A. (1973). Further evidence on the individual welfare function of income: An empirical investigation in The Netherlands. *European Economic Review*. <https://www.sciencedirect.com/science/article/pii/0014292173900299>
25. Procházka, D. (2016). Classification Of Expenses In Income Statement: Is There Any Difference Between Nature And Function From The Students' Point Of View? *TOJET*. [https://www.researchgate.net/profile/David-Prochazka-4/publication/316936539\\_Classification\\_of\\_expenses\\_in\\_income\\_statement\\_Is\\_there\\_any\\_difference\\_between\\_nature\\_and\\_function\\_from\\_the\\_students'\\_point\\_of\\_view/links/599b00a9aca272dff128d5eb/Classification-of-expenses-in-income-statement-Is-there-any-difference-between-nature-and-function-from-the-students-point-of-view.pdf](https://www.researchgate.net/profile/David-Prochazka-4/publication/316936539_Classification_of_expenses_in_income_statement_Is_there_any_difference_between_nature_and_function_from_the_students'_point_of_view/links/599b00a9aca272dff128d5eb/Classification-of-expenses-in-income-statement-Is-there-any-difference-between-nature-and-function-from-the-students-point-of-view.pdf)
26. Schmitz, A. (1967). Production function analysis as a guide to policy in low-income farm areas. *Canadian Journal of Agricultural Economics/Revue ....* <https://doi.org/10.1111/j.1744-7976.1967.tb02399.x>
27. Sosnowski, M. (2015). Redistributive function of fiscal policy and the income inequalities among the society. *Prace Naukowe Uniwersytetu Ekonomicznego We ....* <https://www.ceeol.com/search/article-detail?id=296597>
28. Susanawati, S., Masyhuri, M., Jamhari, J., & ... (2018). Factors Influencing Income of Shallot Farming in Java Indonesia Using UOP Profit Function Model. ... *Conference on Food ....* <https://www.atlantispress.com/proceedings/fanres-18/25907111>
29. Tarigan, R. R. A. (2022). THE EFFECT OF EDUCATION AND INCOME FACTORS IN LAND TRANSFER FUNCTION ON REGIONAL DEVELOPMENT. ... *International Conference of Science Technology and ....*
30. Wang, Z., Zhang, Y., Niu, M., & Fan, Z. (2021). How important is domestic and foreign demand for China's income growth by business function? *Economic Systems Research*. <https://doi.org/10.1080/09535314.2020.1792417>
31. Yoo, M. S., Kim, H. K., Jo, E. M., & Kim, Y. S. (2007). A study on ADL, IADL, and cognitive function of low-income community dwelling elderly. *Journal of Korean Academic ....* <https://koreascience.kr/article/JAKO200703534437154.page>