

## **THE POST SPLIT, ECONOMIC SUCCESS OF SOUTH KOREA AS COMPARED TO NORTH KOREA**

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### **ABSTRACT**

Before 1945, North and South Korea constituted a single, unified Korean peninsula, ruled by a myriad of dynasties. The last colonial rulers of Korea were the Japanese who reined the peninsula till the end of World War II, after which its division into two nations commenced. The division of the peninsula along the 38th parallel was mutually decided by USA and Soviet Union in the August of 1945. Post-split, Soviet Union took control of North Korea and the Soviet Army, with the help of its proxies set up a communist regime there. South Korea on the other hand, set up a military regime, directly supported by USA. Soon after a failed UN-sponsored vote, for Koreans to determine their future, South Korea formed its own government led by Syngman Rhee, while North Korea placed Kim Il Sung as the first premier of Democratic People's Republic of Korea.

In 2016, South Korea became the 11th largest economy in the world (in terms of GDP). Starting as an agriculture-based economy in the 1960s and then transforming into an industrial-based economy, South Korea has experienced one of the largest economic transformations of the past 60 years, often referred to as "The Miracle on the Han River". Considering all the natural resources and industrial set-ups were majorly in the northern part of the colonial Korean Peninsula, this paper aims to analyze the economic policies adopted by South Korea and what went right for them, with the focus on its export & import policies.

North Korea, on the other hand might lag behind economically, but is a major military and nuclear power. This paper also scrutinizes where North Korea spent its resources and money post split and whether its trade, majorly import & export policies, were successful or not.

This paper looks at the trade relations of both the nations with other nations and aims to trace back the route for South Korea's economic triumph.

**SUBJECT AREA:** Detecting the reasons for the post-split, economic success of South Korea as compared to North Korea.

**PROJECT OVERVIEW:** The objective of this research is to –

- Study the relation between GDP and imports & exports of South Korea and its trading partners during its growth time period.
- Study the GDP of North Korea during South Korea's growth time period.
- Inspect the reasons for economic achievements of South Korea compared to North Korea.

**Expected Learning Outcomes:**

- This paper provides an insight on the history and the reasons behind the Korean split and the economic aftermaths of both the nations involved.
- Different trade policies and economic reforms adopted by both nations post-split with major focus on how GDP was affected by their respective export and import policies.
- Studies in which sectors the two economies spent their GDP and resources.
- Reasons why South Korea is one of the leading economies at present and how it surpassed North Korea, even after being on the less developed side of the split.

**A. Introduction**

Republic of Korea (South Korea) and Democratic People's Republic of Korea (North Korea) are two nations that are so close to each other, yet poles apart when we talk about economy. South Korea is the 12<sup>th</sup> largest economy in the world; on the other hand, North Korea ranks as one of the lowest economies in the world. Both starting off from a blank page after the Korean War (1950-53), this paper aims to study South Korea's magical success story and how it left its northern counterpart miles behind.

**B. Division Of Korea**

**B1. Korean Peninsula: Korea before the split**

Before 1945, there was no South or North Korea. What existed was a single Korean Peninsula. Centuries before the split, it has been ruled by a number of dynasties until 1905. After the Russo-

Japanese War in 1905, Korea was annexed under the Japanese colonial rule in 1910. The Japanese then colonized Korea for the next 35 years, until 1945, after which the division of two nations began.

## **B2. Division of Korea**

After ruling the Korean Peninsula for 35 years, the Japanese finally surrendered after the World War II and Korea was liberated from their rule officially on 15<sup>th</sup> August, 1945.

However, the aftermath of the liberation was far from what most Korean would have thought. The Soviet Union and United States of America, the two nations involved in defeating the Japanese, decided to divide Korea in two parts along the 38<sup>th</sup> Parallel. The Soviet Union took control over the Northern part. They installed communist leader “Kim Il Sung” as the first Supreme Leader of North Korea. The Southern part was under direct control of United States, which transitioned it into a republican state. Syngman Rhee was appointed as the first president of South Korea.

Most Koreans believed that the split was temporary; however, the rivalry between the two controlling super powers, combined with the political tensions between the communist and right-wing conservative forces of Korea resulted in establishment of separate government in different parts of Korea.

## **B3. Economic Division**

The percentage distribution of resources between both the nations as per major economic sectors was as follows:

Economic Sectors	North Korea (%)	South Korea (%)
Heavy Industry	65	35
Light Industry	31	69
Agriculture	37	63
Commerce	18	82

## **C. The Korean War (1950-53)**

In May, 1950, assuming that the war was just round the corner, South Korean President Syngman Rhee, issued the following statement to the public of South Korea:

*“We just received reports of North Korean troops gathering around the 38<sup>th</sup> Parallel. There is*

*very little we can do at this point. The US has one foot on South Korea and the other outside, so that if conditions become unfavorable for them, they can just get up and leave."*

As per Rhee's assumption, on 25<sup>th</sup> June, 1950, the North Korean forces namely the Korean People's Army crossed the 38<sup>th</sup> Parallel to enter the South Korea. Backed by Soviet Union (and later by China), their aim was simple, to once again unify the Korean Peninsula, but this time under the supreme reign of Kim Il Sung. The North Korean troops attacked from 3 directions: east, central and west. That from the west being the strongest aimed to capture the capital Seoul.

The responsive measures taken by the South Korean government was to call upon the newly formed United Nations for help. U.N. announced that all the council members must support South Korea and provide no aid to the Northern aggressors. As the oppressors refused to back out, U.N. decided to provide all aid to South Korea including military action and medical support. Initially, 16 countries agreed to UN's call and decided to send their troops (under the leadership of US armed forces) to South Korea's rescue. 5 countries agreed to offer medical aid to the injured soldiers and people of South Korea.

The war that lasted for nearly 3 years saw many gruesome battles including the *Battle of Young-San* at Nakdong River and the high risk *Operation Chromite*. It finally came to an end on July 27, 1953 with the signing of the cease-fire agreement. The war took more than 6 million lives, but no definite conclusion was reached upon as per the future of both the nations. In the midst of all the violence and international politics the people of the Korean Peninsula witnessed the worst 3 years of their lives and were looking forward to a distorted future ahead.

#### **D. Aftermath Of Korean War: The Road To Recovery**

The total death toll of the Korean people was more than 5 million, which accounted for one-sixth of the total population of the Korean Peninsula at that time. The major proportion of this toll consisted of civilian population, a rare tragedy in modern war history. With no definite conclusion of the war and no peace treaty ever being signed in almost 70 years down the line, the two nations still remain at war. Both the nations took witness a large socio-economic loss, the recovery from which seemed impossible.

##### **D1. North Korea: The rise of heavy industries**

The North Korean economy completely shattered after the war. The industrial production reduced by 60%, whereas the agricultural output took a toll of 78%. 600,000 houses, 5,000 schools and 1,000 hospitals were destroyed by heavy bombing used by the US during the war. Reports released by Pyongyang in 1953 revealed that North Korea lost 12% of its population between

1949 and 1953. Almost 1.2 million people migrated to the South during or post war, causing a massive brain drain in the country.

However, their recovery was fast paced, with everything now revolving around their dictator Kim Il-Sung. In the decade to follow, North Korea received abundant technical and financial aid from their long term allies, Soviet Union and China. Major proportions of these funds were used on 2 sectors: building a formidable military and development of heavy industries.

Their primary goal of rapid industrialization was followed by a number of secondary goals that included; training of special professionals to work in the industries, utilizing the women labor forces better, and reducing the infant mortality rate by effective health measures.

## **D2. South Korea: An unpromising recovery (1953-1961)**

Where North Korea recovered relatively quickly, South Korea was still amidst chaos and disorder. To say the least, Syngman Rhee's government cared more about itself rather than people of the nation. The post war conditions of the South can be briefly defined as: political instability, military intervention, heavy reliance on the US, unsuccessful government policies and slow economic growth.

- **Political Instability & Military Intervention**

Since his inception as the president, Rhee failed to prove himself as an effective leader. Rhee was believed to maintain power through bribery, electoral manipulation, and strong-armed tactics. However, with growing urban population and people disgusted with the corrupt government officials, Rhee began to lose its hold on to the power. In 1960 Rhee stood for a consecutive fourth term, but the fraudulent victory of Rhee's vice president candidate led to a nationwide violent student protest called the "April Revolution". Soon after this, Syngman Rhee was nowhere to be found, many believe he took an exile to Hawaii.

Following this on June 15, 1960, South Korea laid down a new constitution that created a parliamentary cabinet led by the Prime Minister Chang Myön. The second republic, as it was called, proved to be a massive failure. The short one year reign witnessed strikes by labors, students and teachers asking for better working conditions, freedom to organize, better pay and most importantly removal of US forces from their country.

It was at this time, a group of army officers led by Park Chung-hee seized powers from Chang Myön. 16th May, 1961, marked the establishment of military reign in South Korea. A second government overthrow in a matter of 13 months.

- **Heavy Reliance on US**

The US provided \$12.6 billion economic aid to South Korea from 1946 to 1976. Major proportion of these funds came just after the war and was used for the purpose of relief, including food and reconstruction of infrastructure. At one point in 1950s, funds from US accounted for almost 80% of total revenue of the government and a good proportion of South Korea's GNP. The government used this aid to accumulate US Dollars.

- **Unsuccessful Policies and Slow Economic Growth**

Under Rhee and Chang Myŏn, the economy grew at a very slow rate. It averaged at only 4% per year, with per-capita growth being less than 2%. These growth rates were considered low as South Korea received constant financial aid from America for economic growth.

These slow rates were a result of unsuccessful government policies adopted by Rhee. It followed an import substitution industrialization policy, under which imports were blocked to protect and develop domestic industries. The policy backfired as South Korea lacked natural resources for raw material and a large internal market for final products.

The US then insisted Rhee, to establish trade relations with Japan to bring in more foreign investment. Rhee became irrational here, as he denied being in a trade relation with their former colonial rulers. Rhee just used the aid received by US to overvalue the currency and keep the economy afloat.

Chang Myŏn's policies were not successful either. During his short one year reign he devalued the currency which led to double digit inflation in the country.

### **E. The Rise Of South Korea: Miracle On The Han River**

With history of years of war and 2 failed government reigns till 1960, no individual would have ever thought that South Korea would become one of the leading economies in the world. But all of it began to change in 1960s when South Korea came under direct military reign led by "Park Chung-hee". The rapid transformation of the economy in almost three decades of military led government is often referred to as "economic miracle" or "Miracle on the Han River" referring to the Han River that flows through the capital city Seoul. The years preceding 1960, the country feared to trade with former colonial ruler Japan and with only a few natural resources at dispose, South Korea had very little to provide what the rest of the world wanted, as a result its international trade was miniscule.

However, two major reforms took place before 1960 that laid a foundation to South Korea's economic miracle. The two reforms being:

- **Expansion of education:** From 1945 to 1960, the number of students enrolled in primary schools increased by three times, and that in higher education by ten times. By 1960, 96%

of primary school age children were attending school. As a result, in 1961, South Korea had the highest percentage of educated work force at disposal as compared to other countries of similar income level.

- Land reforms of 1950: In 1944, the top 3% of the population owned almost 64% of private land. So in the reforms of 1950, private property land holding was restricted to only 7.5 acres per person. As a result, in 1956, top 6% owned only 18% of the land. Traditional peasants became entrepreneurial farmers and other land owners invested in business or established private schools.

### **E1. The Entrepreneurial approach to growth**

South Korea's economic wonder began with the military reign, led by Park Chung-hee. He was determined to make South Korea an independently rich country and thus, removing its status as an economic ward of the US. The motivation to achieve this target landed after seeing rapid growth of heavy industries in North Korea.

Park's government eradicated the corrupt relations between the businessmen of the country and the government, by fining and detaining the wrong doers. This included Lee Byung Chull, the country's richest businessman (also, founder of Samsung). After this, they started working with them, so as to harness their entrepreneurial skills for country's economic development. Park appointed a thirteen member Promotional Committee with Lee Byung Chull as the chair, marking the government's partnership with the entrepreneurial elite.

### **E2. Park's Economic Plans of Success**

Park appointed an Economic Planning Board (EPB), headed by the deputy Prime Minister of the country, with well educated technocrats as members. The banking system was reorganized and all commercial banks were nationalized. Low interest rate loans were provided businesses that fulfilled the needs of economic development. The first five year plan was adopted in 1962, aimed at an unrealistic economic growth rate (what most American advisors felt at that time) of 7.1% for 1962-1966. It was to be achieved by development of light industries for export. To the surprise of everyone, the target was overachieved as the growth rate averaged at a whopping 8.9%. Exports and manufacturing grew at 29% and 15% per year respectively.

As mentioned earlier, the major contributor of this achievement was educated and technically sound population of South Korea. Various research centers were created by the state, such as Korean Institute of Science and Technology (KIST), established in 1966. The state bureaucracy system was modified, giving entry to officials through a highly competitive civil service



examination. This meant that the government offices were now filled with highly educated and highly competent staff only.

The second five year plan (1967-1971) aimed at bringing foreign direct investment in the country to support the rising industrial sector. This brings us to the next part of economic development i.e. Korea's trade relations with the outside world, basically US and Japan.

### **E3. Korea's Trade Relations: US and Japan**

In 1966, South Korea introduced the Foreign Capital Inducement Act. It exempted foreign managers from income taxes, provided tax holidays and streamlined the process of investing in the country. As a result, the US slowly started to reduce direct economic aid; however it still remained the country's top exporter. It also had political and military ties with the US, maintained for economic development. Park sent 300,000 Korean troops to fight along Americans in Vietnam; in return Korean industries were given contracts to supply goods to American allies in Vietnam.

Japan was also equally important for South Korea's economic development, as it acted as a model for South Korea of what non-western countries do to be successful. As one of the Korean business community puts it "Do what the Japanese have done, but do it cheaper and faster." The Korean cheap labor and Japanese capital and technology formed the perfect recipe of growth. In no time, after 1966, Japan became the second largest foreign investor in Korea, just behind the US. Between 1966 and 1979 it supplied nearly 60% of foreign technology to South Korea.

The supply from Japan and export of finished products to the US became a major reason for South Korea's rapid growth.

### **E4. Shift to Heavy Industries**

Park's desire to become economically and politically autonomous, led to major policy changes in the 1970s. With America's increasing close ties with People's Republic of China in 1971-72 and withdrawal of their forces from South Korea, Park realized it was now time to become economically self-reliant. Therefore, he aimed at development of heavy industries in the coming decade. Self-reliance was imposed in 1973 with new restrictions on direct foreign investment. This marked the beginning of Heavy and Chemical Industry (HCI) phase of economic development in the country. In this phase, 6 industries were targeted: steel, chemical, metal, machine building, shipbuilding, and electronics. The major part of this development took place in five small provincial cities, namely Yosu- Yöchön, for petrochemicals, Ch'angwön, for machine-building, P'ohang, for steel, Okp'o, for shipbuilding; and the Kumi complex for



electronics.

Most economist thought that South Korea wasn't ready for this as it lacked the resources and just wasn't large enough to support heavy industries. But again, South Korea proves everybody wrong as economy boomed with double digit growth figures. In the decade following 1972, steel production increased 14 times. Pohang Iron and Steel Company (POSCO) competed with largest steel manufacturers in the world. In 1980, South Korea also became the second largest ship builder in the world.

However, all this economic success came at a cost to bear. In late 1970s, annual inflation reached as high as 40%. Country also mounted large amount of foreign debts for its various industrial and infrastructural projects.

### **E5. Contribution of Chaeböls: large family owned conglomerates**

Other major contributors to the economic miracle were Chaeböls. These were large family owned businesses which received special privileges from the government as they contributed largely to economic goals of the country. However, the performance principal involved meant that they would only receive the state support and privileges if they continue to perform well in domestic and international markets. The largest of these Chaeböls were:

- **Samsung:** It was founded by Lee Byung Chull in 1938 and is one of the largest business houses in Korea. Samsung produced a number of products throughout, but shifted its focus towards electronics in 1960s. In early 1980s, Samsung became one of the largest TV manufacturers in the world. Later in 1980s, it shifted to production of Semiconductors.
- **Hyundai:** The largest and the fastest growing of the Chaeböls, was Hyundai (founded by Chung Ju-yung). It started as a construction company for US armed forces and South Korea. In 1967, Chung also founded Hyundai Motors, which gave South Korea its first car called Pony. Then in 1973, came Hyundai Shipbuilding and Heavy Industries, in response to the HCI development. Later in 1980s, it entered the electronics market, becoming one of the largest Chaeböls in the country.
- **Lucky-Goldstar (LG):** Founded in 1947 by Koo In-hwoi as Lucky Chemical Company, it was the largest manufacturer of toothpaste in the country. Then in 1960s it entered into electronics business, under the Goldstar label. Later, shortened its name to LG, it became world's largest consumer electronics firms.

### **E6. Entry into OECD as a Developed Economy**

The miraculous growth of South Korea in the past 3 decades, finally paid off, as in 1996 South Korea entered Organization of Economic Cooperation and Development (OECD), a thirty-member group of developed nations. This meant that South Korea now officially shifted from a developing economy to a developed economy. However, during the Asian financial crises of 1997, the burden of corporate debt hit South Korea hard and it required an International rescue package.

This alarmed the newly elected President Kim Dae Jung and he called for reforms immediately. The Chaeböls were forced to reduce subsidiaries (in order to reduce corporate debt) and focus on core business. They were also instructed to lower the debt-equity ratio. Other measures included liberalization of labor markets.

As a result, the economy once again witnessed almost double digit growth in 1999-2000 and it moved from a debtor to a creditor nation in few years. Beyond 2000, the growth rate eventually slowed down. But what it witnessed in the preceding years is still one of the best growth stories of a country.

## **F. The Downturn In North Korea's Economy**

Since coming into existence, North Korea or the Democratic People's Republic of Korea has lived at the extremes of international perceptions. North Korea is known to be secretive, and it does not release economic data. The region has not published any official indicators or statistics on its macroeconomic conditions since 1965. North Korea had never tried to integrate itself into the larger international community. For decades after the split, North Korea seemed to be ahead of its South counterpart, in the economic and strategic race between the two. Even in the 1970's, Washington and Seoul considered per capita output to be more in North as compared to South Korea. By the start of 1990's, however, the tables had completely turned. Rapid and sustained economic growth in South Korea helped the country in overtaking a crumbling North Korean economy. There are numerous reasons, some of which are external but mostly internal, because of which the North couldn't match South's economic standards. The blame for the downfall of a strong economy like North Korea with good amount of resources cannot be pinned on any one policy. A series of wrong policies by the military led dictatorship never let the North Korean economy really prosper. Some of these reasons have been discussed subsequently

### **F1. The Sino-Soviet split and the fall of USSR**

North Korea got most of the heavy industries during the Korean split and thus, the Sino -Soviet (1956-66) split saw both major communist states contest for control over the country. In the 1980's, though the friction between the two communist states abated, they still provided North

Korea diplomatic, economic and military support against the capitalist community (mainly US). They thought of North Korea as an optimum and cheap instrument to hold US forces away from other disputed locations like Eastern Europe and Taiwan.

On the other hand, US were in full support of South Korea. It invested heavily in military and financial resources that would be needed to defeat another invasion of the South by the North, if it ever came to that.

The 1991 collapse of USSR was a turning point in the fate of North Korea. The post-1991 Russian leadership neither had the political motivation, nor did it have enough economic resources to provide help to North Korea. The Chinese, at the same time, wanted to enter the emerging global community, and thus shifted their focus towards their own economic and political problems. This clearly meant the end of preferential economic assistance provided to North Korea by China and USSR.

Post the fall of USSR, North Korea's economy saw a steep and ghastly downturn. Its economic performance from thereon was so disastrous that North Korea became the first urbanized and literate society in human history to suffer a famine during peace time.

## **F2. The North Korean famine**

The North Korean famine aka the Arduous March was a period of mass starvation clubbed with an economic crisis from 1994-98 in North Korea. According to the North Korean Government, 225000-235000 people died due to famine though many researchers have estimated this figure to be around 2.5-3.5 million people.

North Korea adopted the Stalinist economic model, looking to trace the footsteps of USSR and favored military production and heavy industries over the production of food and the needs of the general public. Following this model, the North Korean regime diverted many critical resources to military production for many decades. However, unlike USSR, North Korea lacked abundant resources and manpower, leading to inefficiencies and ineffectiveness in their economic plans. Even in the sectors that the government termed as 'priority sectors', execution of development plans was uneven because the sectors that were meant to fuel this development like energy and mining were unable to provide the power and raw materials required by the new factories.

Also, in 1995, North Korea practically blocked food shipments to the north-eastern region of the country to ensure subsistence food supplies for the capital Pyongyang, whose support they wanted during elections.

Low domestic revenues, very little foreign trade benefits and lack of emphasis on food production under the Stalinist model grouped with the fact that Russia and China had stopped sending heavily-subsidized food supplies to North Korea after the cold war, were cited as the main reasons for the famine by various researches. Though, a number of other policies like blocking of food shipments only worsened the famine further.

### **F3. Military and nuclear expenditure**

Today, North Korea ranks 6th in the list of countries, with most nuclear weapons. This military prowess comes at a cost - a lot of the revenue generated by the government is spent on nuclear armament and military, and the story wasn't very different back in the days. As mentioned before, under their economic model North Korea prioritized military and nuclear expenditure over production of food and basic needs of the people. Their spending on imports and foreign benefits were minimal and this was a major hurdle in North Korea's economic development.

Even when North Korea was struck by the famine, Pyongyang was busy building mass destruction weaponry. In 1998, Pyongyang launched a multi-stage ballistic rocket over Japan, the Taepodong, and with that it entered the elite club of modern states that demonstrated long-range missile capabilities. With the help of Soviet engineers, North Korea built the Yongbyon Nuclear Scientific Research Center and built a reactor in 1963. They built another research reactor in Yongbyon as well an ore processing plant in 1979.

When it comes to military expenditure, North Korea spent more than a quarter of their GDP on military building under the Stalinist economic model. This amount has only been increasing with time.

Thus, at the dawn of the 21st century North Korea emerged as a singularly troubled and troubling economy. The country seemed like it was always on the brink of a famine, even though it possessed long range missiles, nuclear weapons and a lot of military power.

### **F4. Lack of Exports and Imports**

Due to the major spending on military building and the possession of nuclear weapons by North Korea, it became a social pariah and had to face onslaught of economic and financial sanctions by world powers like the US.

The following are the sanctions imposed on North Korea:

- The trade of arms and military equipment, dual-use technologies, vehicles, industrial machinery and metals is banned

- Freezed assets of individuals involved in the country's nuclear program
- Ban on import of certain luxury goods
- Ban on export of electrical equipment, coal, minerals, seafood and other food and agriculture products, wood, textiles and stones
- North Korean labor exports are capped
- Imports of oil and refined petroleum products are capped
- Ban on natural gas imports
- Fishing rights are restricted
- Scientific and technical cooperation with North Korea is restricted

Due to all these sanctions and some more sanctions imposed by the US, trade benefits of North Korea were minimized and most of the major economies don't want to trade with them till date. Now, North Korea majorly trades coal and clothing with China. The lack of income from exports has cost the development of the North Korean economy dearly.

#### **F5. Corruption**

Corruption has dampened the economic prospects of North Korea since its foundation. But after the collapse of USSR, the corruption became even more apparent as it trickled down to all levels of the society. Clearly, the problem of corruption in North Korea is still rampant with country ranking 175th out of 177 countries in Transparency International's 2013 Corruption Perceptions Index.

Corruption was the main reason behind the failure of North Korea's official rationing system, which eventually led to the famine that killed millions of people. This happened in 1994 due to the political instability brought about by the then President Kim Il-Sung's death, economic freefall after the fall of USSR and the subsequent break down of law and order in the country. After the abolition of monthly rations, only the people most loyal to the Kim family and the most privileged members of the society continued to receive regular food.

The failure of the rationing system led to an expansion in the black market, forcing the citizens to obtain food and goods from the market according to the forces of supply and demand. All types of items, valuable or not, were available in these black markets, that seemed to appear overnight, offering a new avenue for corruption with their unregulated business. Also, since valuable foreign goods were also available in these markets, the privileged class began being rewarded with valuable foreign currency, which created avenues for financial corruption in North Korea. Since the rationing had collapsed, the government had no option but to turn a blind eye to these black markets.

The North Korean regime did try to control these markets with the "7.1" Policy, according to which prices of goods were determined by market forces, but the policy only highlighted the gaps between the actual and the market prices and thus failed.

The inconsistency of the regime in adhering to its own economic policies and regulations, forced the people to rely on illegal markets and abuse of political power for survival. This instilled in the North Korean people an idea of fending for oneself, instead of pursuing collective good of the society as a whole.

The presence of an untrustworthy regime in North Korea was the main reason behind the corruption and it still is. This regime offered people incentives for their political loyalty, which by and by made the underprivileged loose trust in the regime. Failures of most major policies can be at least partly, if not completely blamed on corruption and thus it's one of the main reasons why North Korea couldn't develop economically post the split.

### **Econometric Analysis**

Till now, we have theoretically scrutinized the factors that led to the miraculous achievements of the South Korean economy, while also shedding some light on what went wrong for their Northern counterpart and eventually led to their complete failure as an economy. We can now test the observed relations empirically using econometric models. The tool used for the making of the econometric models is linear regression. In statistics, linear regression is a linear approach to modeling the relationship between a scalar response (or dependent variable) and one or more explanatory variables (or independent variables).

### **Research Methodology**

Our aim through these models is to empirically identify the factors behind the economic success of South Korea right after its split from North Korea. More precisely, we aim to test the strong relationship between the increase of exports and imports (trade benefits), which we have cited earlier as one of the main reasons behind South Korea's economic growth. Also, we have taken into consideration the trade relations of South Korea with its major trading partners i.e. USA and Japan. The time period selected for this analysis is 1960-2000. The afore mentioned time period has been selected as it was the time period South Korea's miraculous economic growth occurred. Annual data for the following variables was obtained:

- GDP of South Korea
- GDP of North Korea

- Exports of South Korea
- Imports of South Korea
- GDP of Japan
- GDP of US

These models were developed using Stata and Microsoft Excel. Stata is a general-purpose statistical software package, which has capabilities to perform data management, statistical analysis, graphics, simulations, regression, and custom programming. The graphs shown were made on Tableau. It is interactive data visualization software that transforms the way we use data to solve problems

### **Model 1: Time Trends**

Note: To analyze the time trends, units for GDP of both nations have been taken as “Geary–Khamis dollar” or “International dollar”. It is a hypothetical unit of currency that has the same purchasing power parity that the U.S. dollar had in the United States at a given point in time. It is widely used in economics, especially for comparison of data between 2 countries. This was the only unit; data for North Korea was available. So as to make the comparison between both the nations, the same has also been taken for South Korea.

### **Model 1A: Relationship between North Korean GDP and Time Variable i.e. years of the study period (1960-2000)**

An OLS linear regression model was adopted to analyze the time trend of North Korean GDP. Here, GDP is a function of years.

$$\text{GDP}_{\text{NK}} = f(t)$$

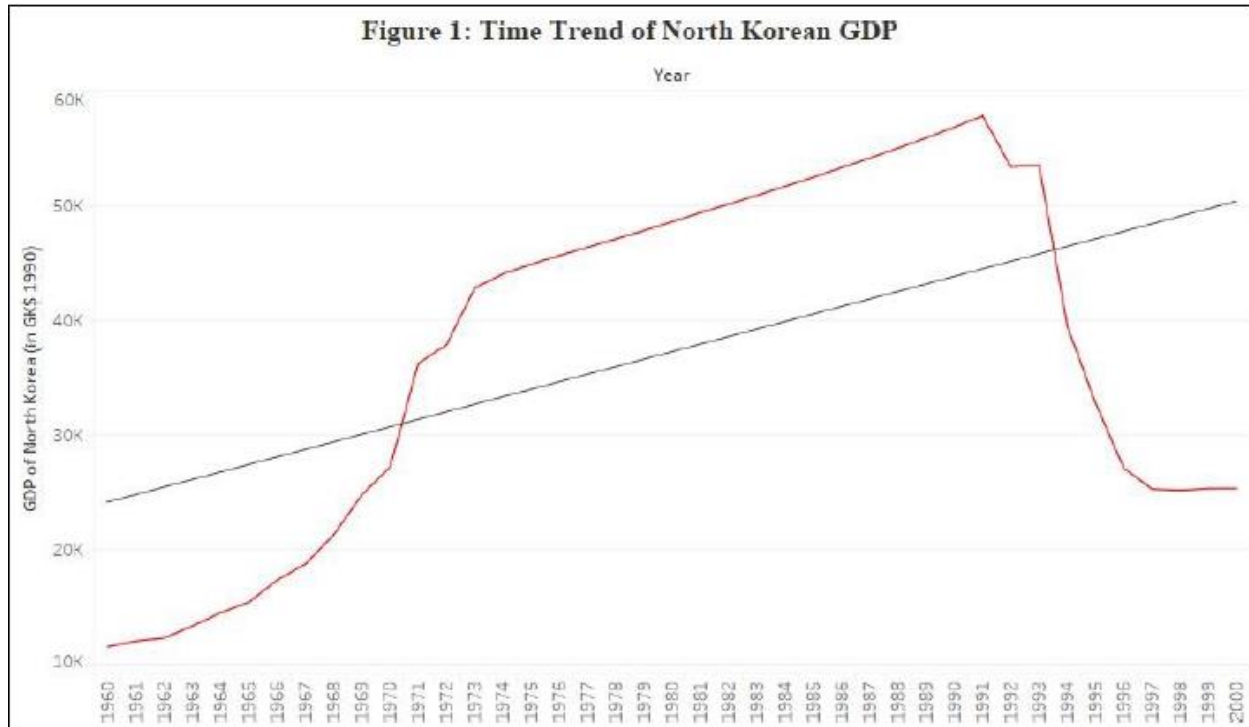
$$\text{GDP}_{\text{NK}} = 23386.332 + 657.024t$$

Where, Dependent Variable:  $\text{GDP}_{\text{NK}}$  = GDP of North Korea (in Millions 1990GK\$)

Independent Variable:  $t$  = Time Variable i.e. years

The regression equation states that from 1960, as the year progresses by 1, the GDP of North Korea grows by only \$657.024 million on an average.





As we can see from figure 1, North Korean GDP grew rapidly till early 1970s due to growth of heavy industries. After that the growth slowed down, as Soviet Union withdrew its support. The economy witnessed a severe hit from 1994-1998 because of the North Korean famine.

**Model 1B: Relationship between South Korean GDP and Time Variable i.e. years of the study period (1960-2000)**

An OLS linear regression model was adopted to analyze the time trend of South Korean GDP. Here, GDP is a function of years.

$$GDP_{SK} = f(t)$$

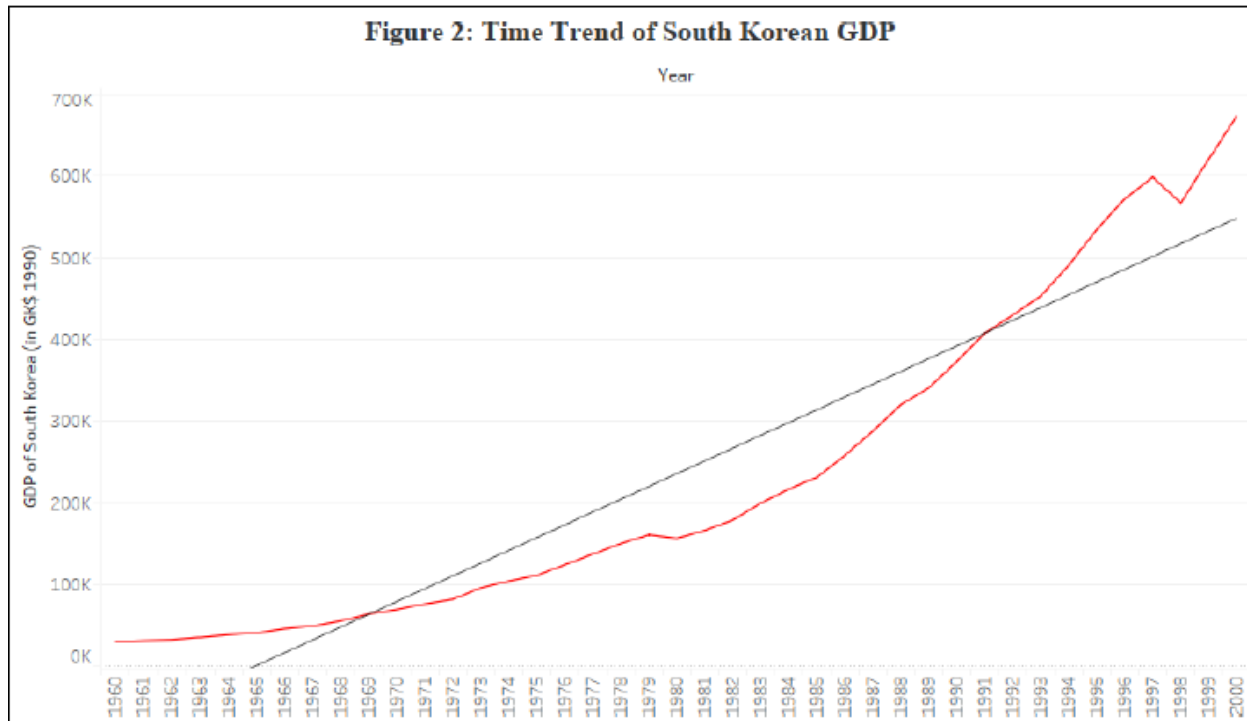
$$GDP_{SK} = -93440.015 + 15623.117t$$

Where, Dependent Variable:  $GDP_{SK}$  = GDP of South Korea (in Millions 1990 GK\$)

Independent Variable:  $t$  = Time Variable i.e. years

The regression equation states that from 1960, as the year progresses by 1, the GDP of South

Korea grows by \$15623.117 million on an average. This number is a lot more than as we compare it to the average growth of North Korea.



As the figure 2 shows, the GDP of South Korea has shown an overall upward trend from 1960 to 2000. The growth along the years has been so rapid that the y-intercept term in the equation comes out to be negative. It is shown in the figure through a steeper trend line. As such the intercept term has no significance.

A slight fall in GDP was witnessed from 1997 to 1998 because of the Asian financial crisis of 1997, but the economy soon recovered in the years to follow.

**Model 1C: Relationship between South Korean Exports and Time Variable i.e. years of the study period (1960-2000)**

An OLS linear regression model was adopted to analyze the time trend of South Korean Exports. Here, Exports are a function of years.

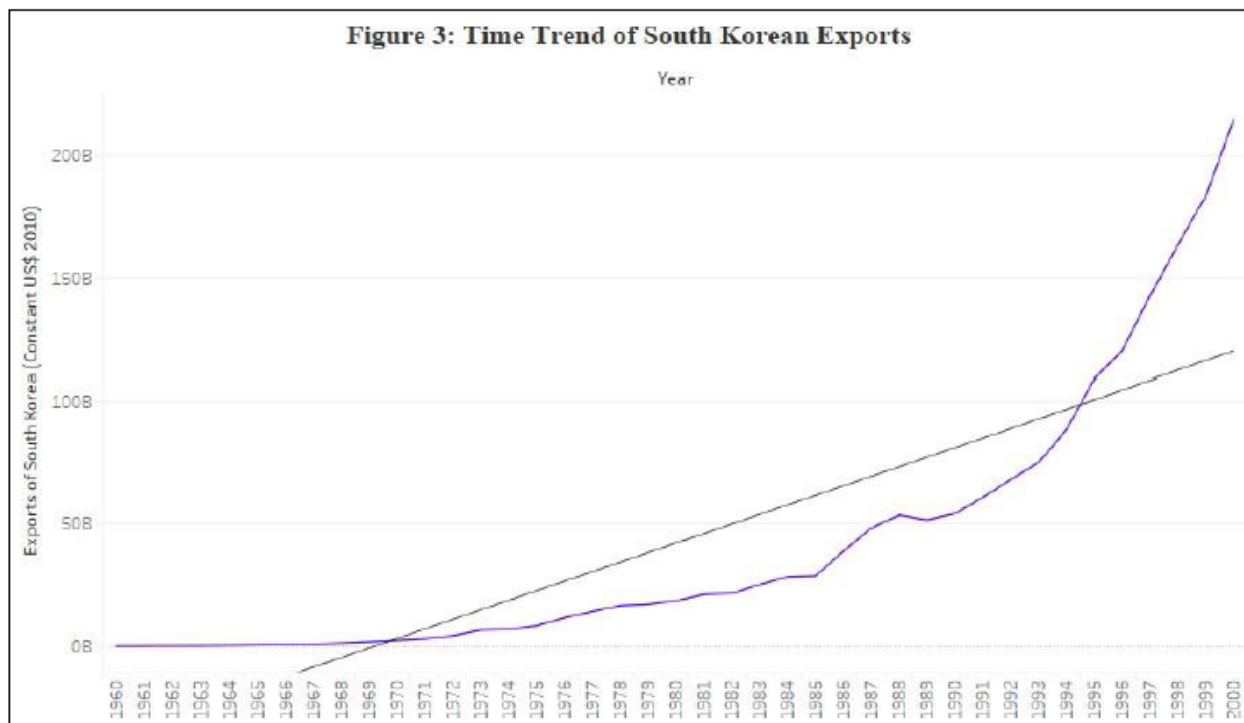
$$X_{SK} = f(t)$$

$$X_{SK} = - 39.98 + 3.898t$$

Where, Dependent Variable:  $X_{SK}$ = Exports of South Korea (in Billions US\$)

Independent Variable:  $t$  = Time Variable i.e. years

The regression equation states that from 1960, as the year progresses by 1, the Exports of South Korea grows by \$3.898 billion on an average.



As shown in the figure, the Exports were significantly low in 1960s; however from 1970s the figures have shown an overall upward trend, this was because of the change in government policies to promote trade. The growth along the years has been so rapid that the y-intercept term in the equation comes out to be negative. As such the intercept term has no significance.

**Model 1D: Relationship between South Korean Imports and Time Variable i.e. years of the study period (1960-2000)**

An OLS linear regression model was adopted to analyze the time trend of South Korean Imports. Here, Imports are a function of years.

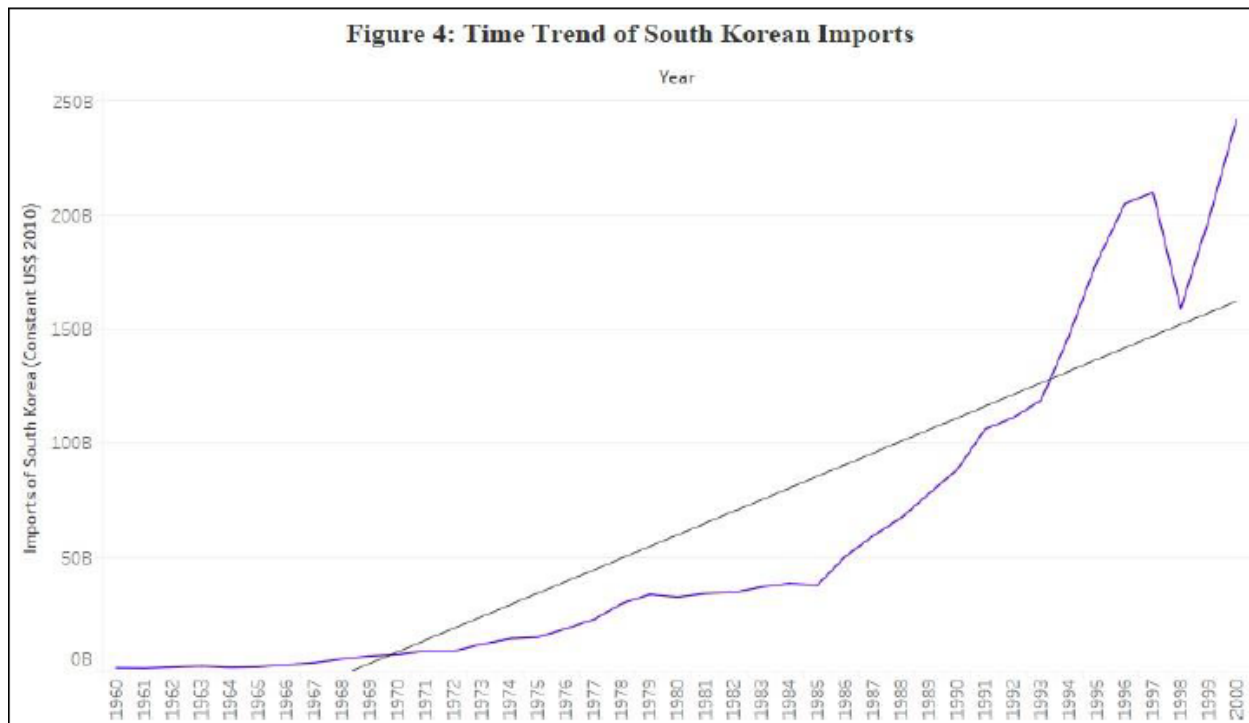
$$M_{SK} = f(t)$$

$$M_{SK} = - 48.12 + 5.121t$$

Where, Dependent Variable:  $M_{SK}$  = Imports of South Korea (in Billions US\$)

Independent Variable:  $t$  = Time Variable i.e. years

The regression equation states that from 1960, as the year progresses by 1, the Imports of South Korea grows by \$5.121 billion on an average.



As shown in the figure, the Imports were significantly low in 1960s; however from 1967 the figures have shown an overall upward trend, this was because of the change in government policies that invited foreign investment in the country. The growth along the years has been so rapid that the y-intercept term in the equation comes out to be negative. As such the intercept term has no significance.

A slight fall in Imports was witnessed from 1997 to 1998 because of the Asian financial crisis of 1997, but the imports soon rose in the years to follow.

**Model 2: Relationship Between GDP Of South Korea With Its Exports And Imports.**

**Model 2A: Relationship between GDP of South Korea with its Exports.**

An OLS linear regression model was adopted to analyze the relationship between GDP of South

Korea and its export from 1960-2000.

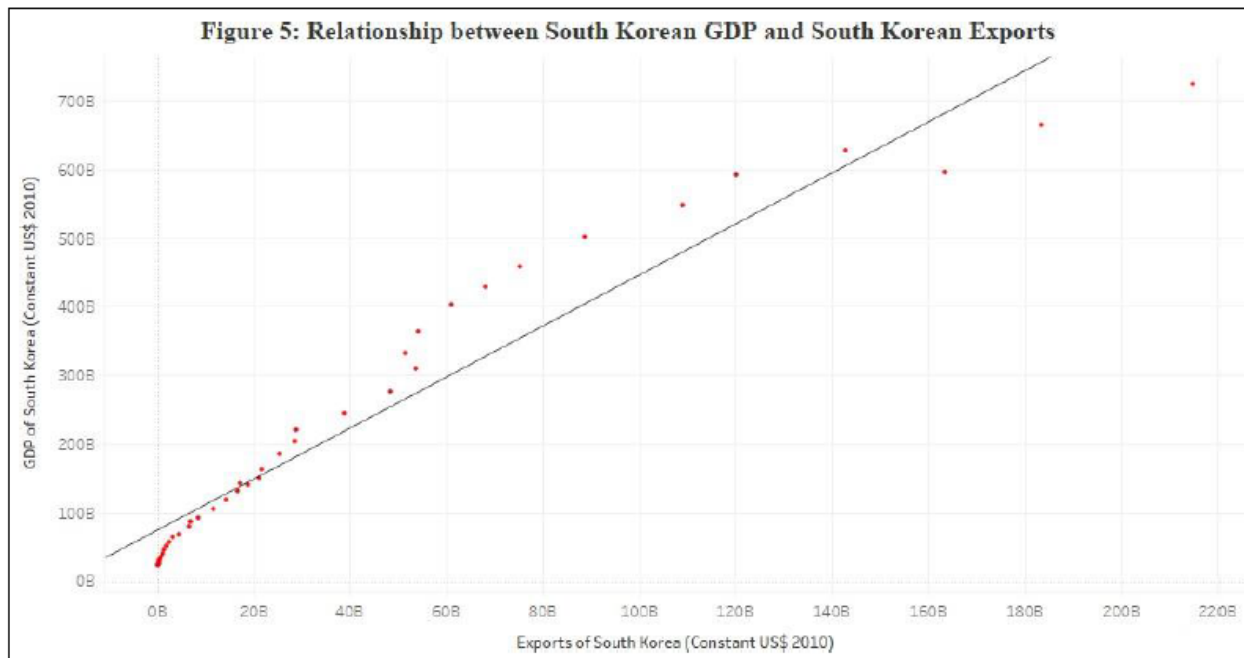
$$GDP_{SK} = f(X_{SK})$$

$$GDP_{SK} = 74280000000 + 3.714X_{SK}$$

Where, Dependent Variable:  $GDP_{SK}$  = GDP of South Korea (in Constant US\$ 2010)

Independent Variable:  $X_{SK}$  = Exports of South Korea (in Constant US\$ 2010)

The above regression equation is obtained by regressing GDP of South Korea on Exports of South Korea. It shows a positive relationship between GDP of South Korea and Exports of South Korea with an  $R^2$  of 0.929. The coefficient term signifies that if exports of South Korea increase by 1 billion, the GDP of South Korea would increase by 3.714 billion. The intercept term signifies that if South Korean exports were zero, the GDP would be \$74,280,000,000 during 1960-2000.



**Model 2B: Relationship between GDP of South Korea with its Imports.**

An OLS linear regression model was adopted to analyze the relationship between GDP of South Korea and its Imports from 1960-2000.

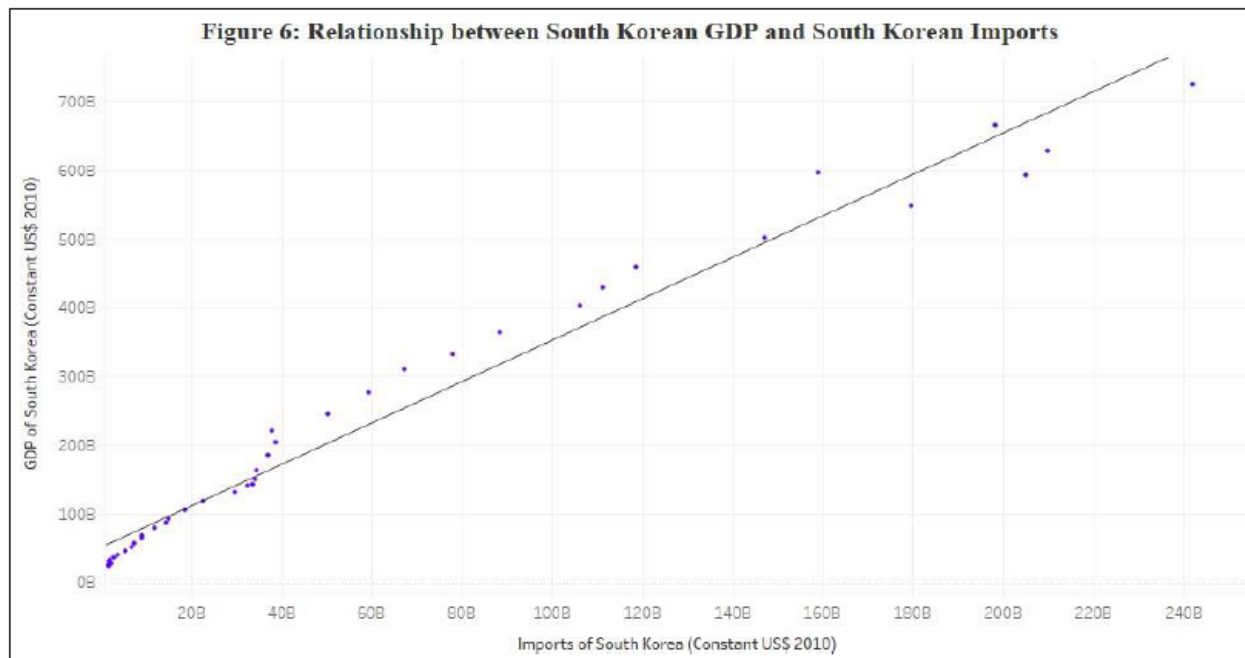
$$GDP_{SK} = f(M_{SK})$$

$$GDP_{SK} = 51030000000 + 3.009M_{SK}$$

Where, Dependent Variable:  $GDP_{SK}$  = GDP of South Korea (in Constant US\$ 2010)

Independent Variable:  $M_{SK}$  = Imports of South Korea (in Constant US\$ 2010)

The above regression equation is obtained by regressing GDP of South Korea on Imports of South Korea. It shows a positive relationship between GDP of South Korea and Imports of South Korea with an  $R^2$  of 0.973. The coefficient term signifies that if imports of South Korea increase by 1 billion, the GDP of South Korea would increase by 3.009 billion. The intercept term signifies that if South Korean imports were zero, the GDP would be \$51,030,000,000 during 1960-2000.



### Model 3: Relationship Between GDP Of US With Exports And Imports Of South Korea

#### Model 3A: Relationship between GDP of US with Exports of South Korea.

An OLS linear regression model was adopted to analyze the relationship between GDP of US and exports of South Korea from 1960-2000.

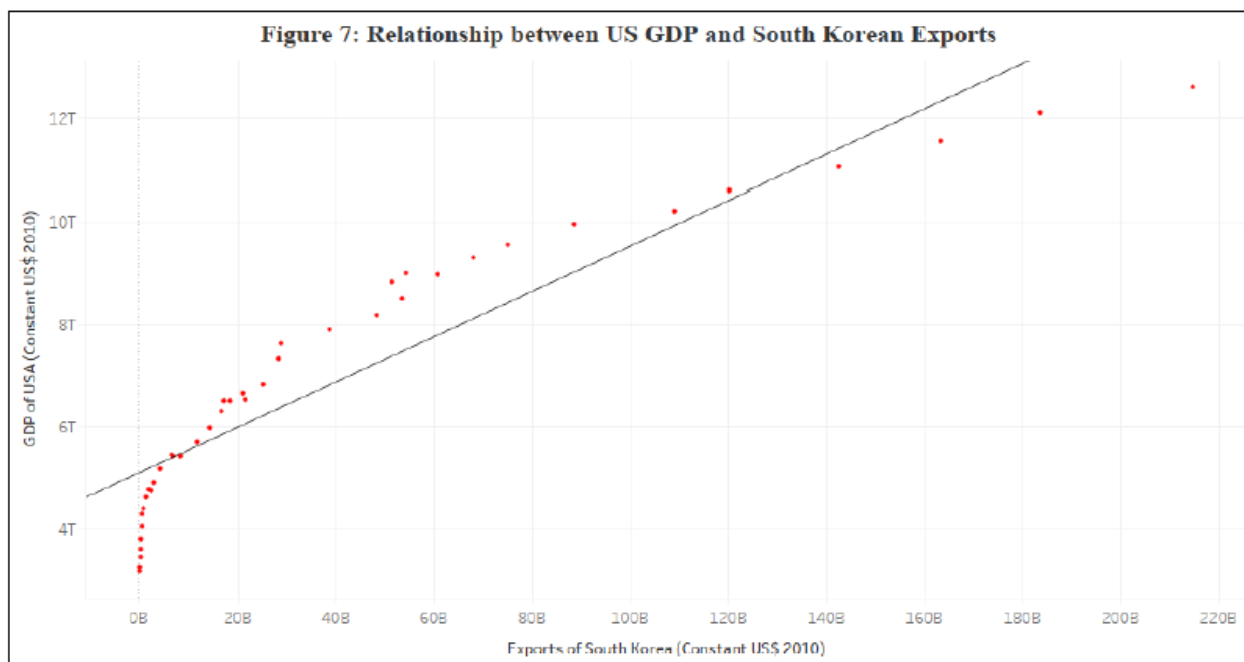
$$GDP_{US} = f(X_{SK})$$

$$GDP_{US} = 510100000000 + 44.256X_{SK}$$

Where, Dependent Variable:  $GDP_{US}$  = GDP of USA (in Constant US\$ 2010)

Independent Variable:  $X_{SK}$  = Exports of South Korea (in Constant US\$ 2010)

The above regression equation is obtained by regressing GDP of US on Exports of South Korea. It shows a positive relationship between GDP of US and Exports of South Korea with an  $R^2$  of 0.854. The coefficient term signifies that if exports of South Korea increase by 1 billion, the GDP of US would increase by 44.256 billion. The intercept term signifies that if South Korean exports were zero, the GDP would be \$5,101,000,000,000 during 1960-2000.



**Model 3B: Relationship between GDP of US with Imports of South Korea.**

An OLS linear regression model was adopted to analyze the relationship between GDP of US and imports of South Korea from 1960-2000.

$$GDP_{US} = f(M_{SK})$$

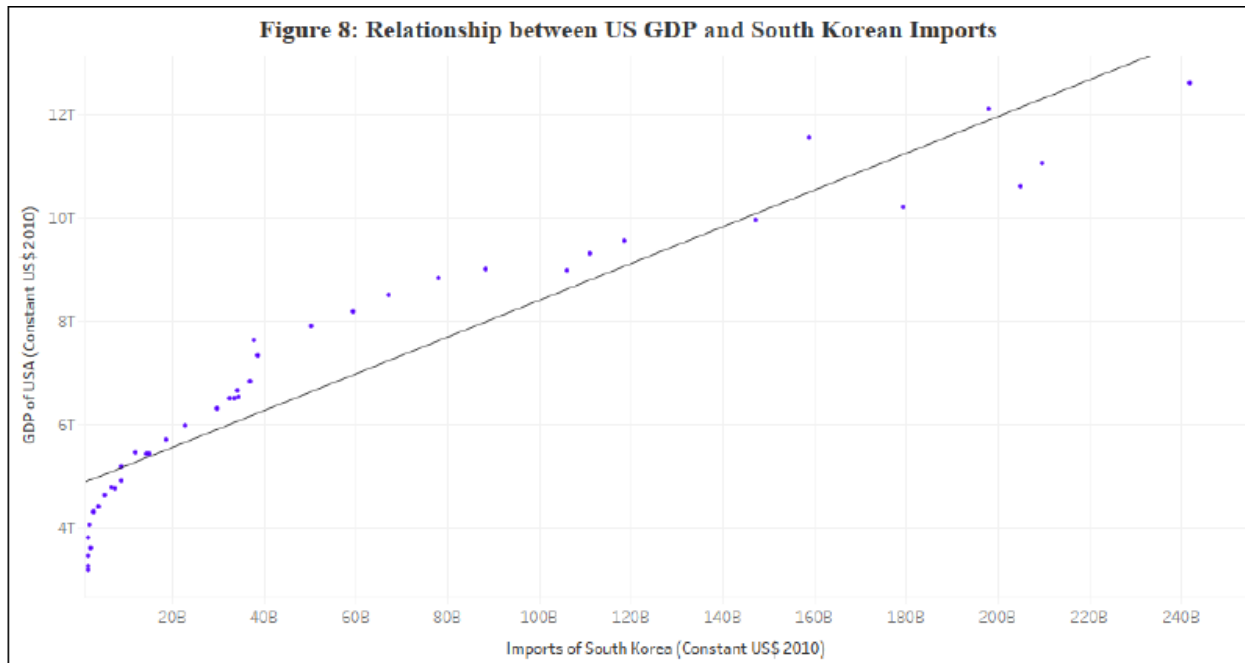
$$GDP_{US} = 4840000000000 + 35.581M_{SK}$$

Where, Dependent Variable:  $GDP_{US}$  = GDP of USA (in Constant US\$ 2010)

Independent Variable:  $M_{SK}$  = Imports of South Korea (in Constant US\$ 2010)



The above regression equation is obtained by regressing GDP of US on Imports of South Korea. It shows a positive relationship between GDP of US and Imports of South Korea with an  $R^2$  of 0.882. The coefficient term signifies that if exports of South Korea increase by 1 billion, the GDP of US would increase by 35.581 billion. The intercept term signifies that if South Korean exports were zero, the GDP would be \$4,840,000,000,000 during 1960-2000.



**Model 4: Relationship Between GDP Of Japan With Exports and Imports Of South Korea**

**Model 4A: Relationship between GDP of Japan with Exports of South Korea.**

An OLS linear regression model was adopted to analyze the relationship between GDP of Japan and exports of South Korea from 1960-2000.

$$GDP_{JAP} = f(X_{SK})$$

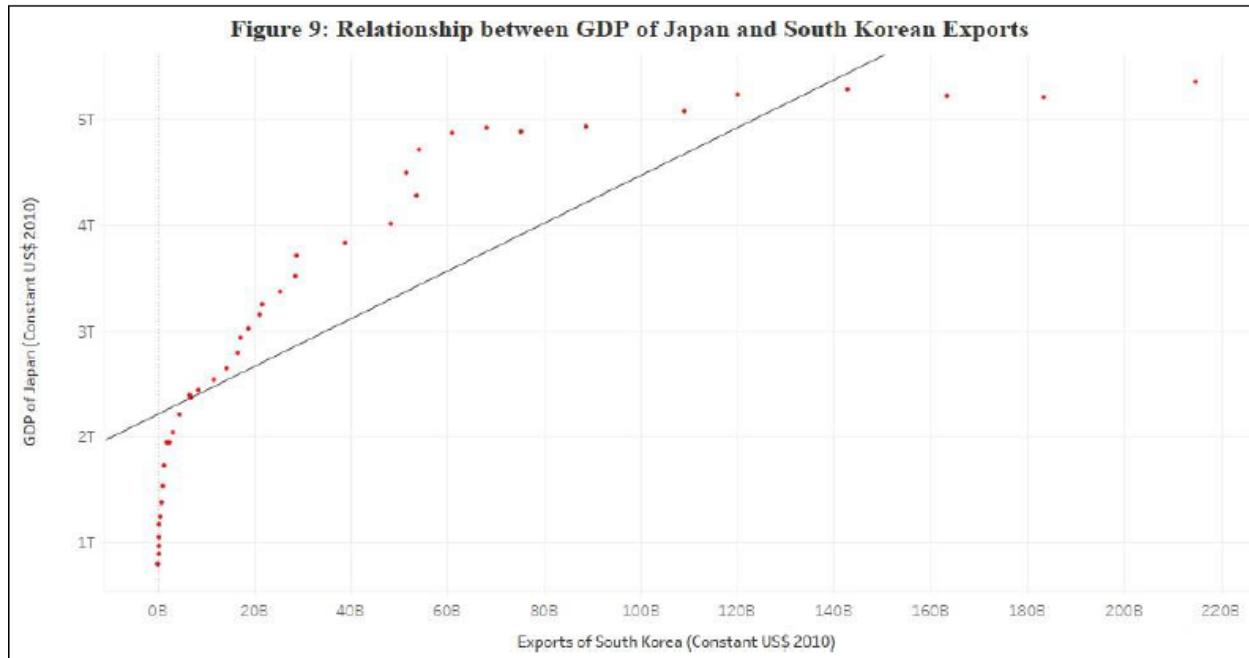
$$GDP_{JAP} = 2209000000000 + 22.511X_{SK}$$

Where, Dependent Variable:  $GDP_{JAP}$  = GDP of Japan (in Constant US\$ 2010)

Independent Variable:  $X_{SK}$  = Exports of South Korea (in Constant US\$ 2010)

The above regression equation is obtained by regressing GDP of Japan on Exports of South Korea. It shows a positive relationship between GDP of US and Exports of South Korea with an

$R^2$  of 0.695. The coefficient term signifies that if exports of South Korea increase by 1 billion, the GDP of Japan would increase by 22.511 billion. The intercept term signifies that if South Korean exports were zero, the GDP would be \$2,209,000,000,000 during 1960-2000.



**Model 4B: Relationship between GDP of Japan with Imports of South Korea.**

An OLS linear regression model was adopted to analyze the relationship between GDP of Japan and Imports of South Korea from 1960-2000.

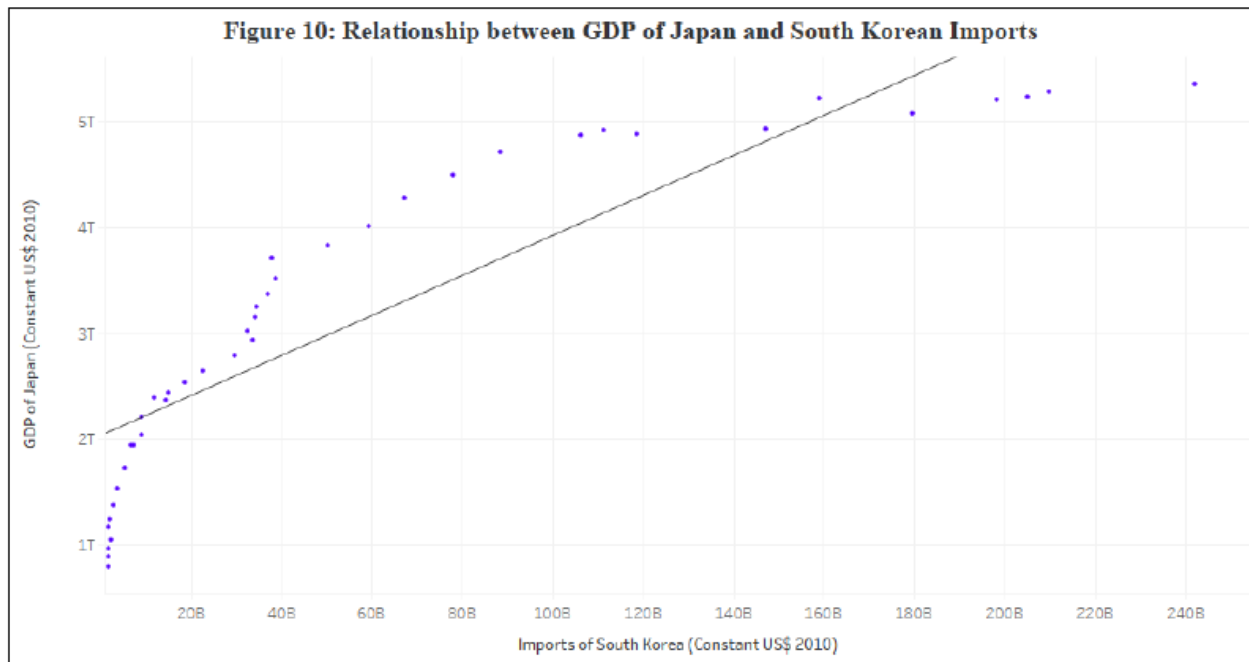
$$GDP_{JAP} = f(M_{SK})$$

$$GDP_{JAP} = 2032000000000 + 18.835M_{SK}$$

Where, Dependent Variable:  $GDP_{JAP}$  = GDP of Japan (in Constant US\$ 2010)

Independent Variable:  $M_{SK}$  = Imports of South Korea (in Constant US\$ 2010)

The above regression equation is obtained by regressing GDP of Japan on Imports of South Korea. It shows a positive relationship between GDP of US and Exports of South Korea with an  $R^2$  of 0.777. The coefficient term signifies that if exports of South Korea increase by 1 billion, the GDP of Japan would increase by 18.835 billion. The intercept term signifies that if South Korean exports were zero, the GDP would be \$2,032,000,000,000 during 1960-2000.



### Findings And Conclusions

The following few observations summarizes our study of miraculous economic growth of South Korea, and failure of its northern counterpart from 1960-2000.

#### 1. GDP Comparison of both the nations

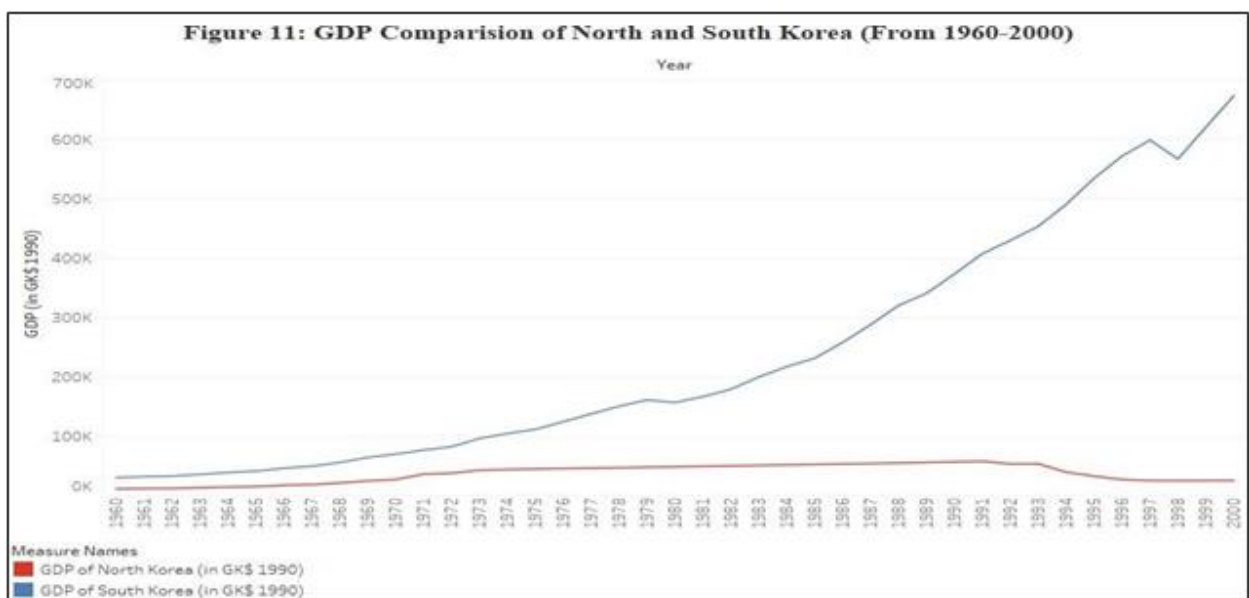


Figure 11 shows a comparison of GDP of both the nations from 1960-2000. As it is pretty evident from the figure itself that South Korea’s GDP growth has truly been miraculous over the years, leaving its northern counterpart miles behind.

Major reasons for South Korea’s “Miracle on the Han River” were the economic reforms brought in by military led government of ‘Park Chung-hee’. From supporting small scale businesses to invite foreign investment in the country to investing in HCIs, everything just fitted right for the South Korean economy. The educated population of South Korea served as the backbone of the economic reforms brought in the country. A slight fall in the GDP of South Korea is seen from 1997 to 1998 because of the Asian financial crisis of 1997.

North Korea’s economy on the other hand has been languishing and could never really grow given all the flaws in the anarchic government system. Their GDP took a big hit in 1991 due to the collapse of USSR, as it was the main provider of economic and military support to North Korea. There was another massive dip around 1994 when the Arduous March or the North Korean famine started. The famine was an economic crisis clubbed with a period of mass starvation. The famine not only killed millions of people, it also destroyed the heavy industries and diminished domestic revenues. The corruption levels in North Korea only made things worse for them. The failure of the rationing system, which was the main source of food for many citizens, forces people to rely on black markets, thus destroying the markets of the country and with it completely shattering its economy.

## 2. Exports to US and Japan

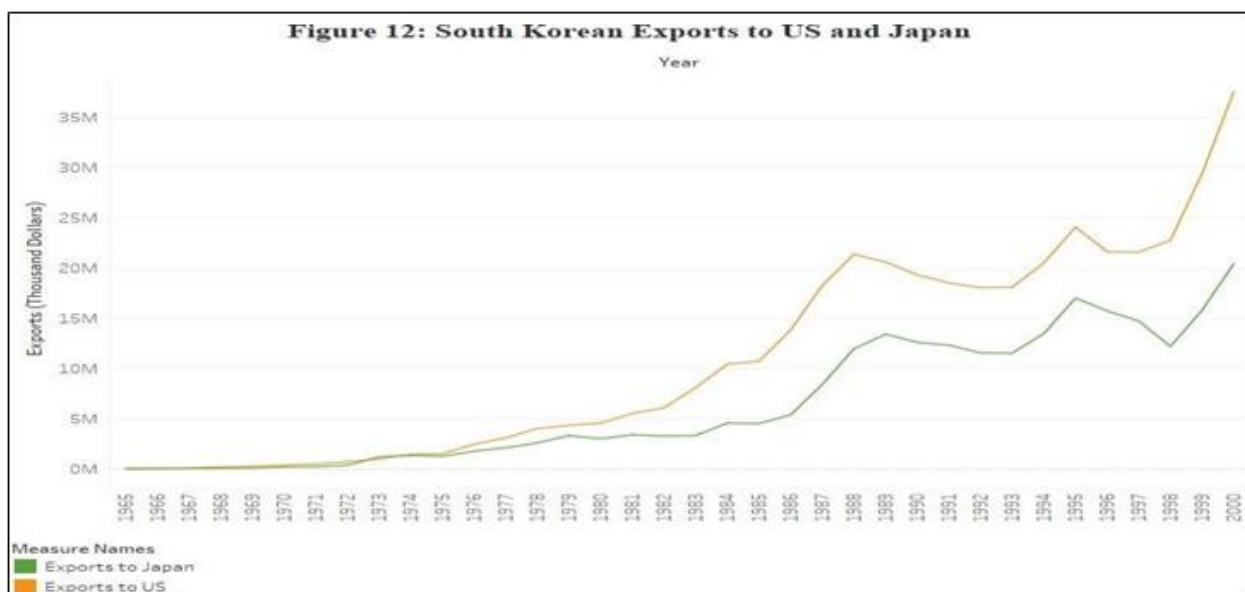


Figure 12 shows South Korea’s exports to US and Japan from 1965-2000. As seen from the figure, the trade was very minimal till 1970. After that it shows an overall upward trend and at a very high rate. The major reason for that was the emergence of Heavy and Chemical Industries (HCIs), which not only catered the domestic demand but also supplied to different parts of the world. The large family owned businesses called Chaeböls also played a major role in increasing the exports of the country. South Korean companies like Samsung (electronics), Hyundai (vehicles and shipbuilding) and LG (electronics) were one of the global market leaders in their respective fields in 1980s and 1990s.

### 3. Imports from US and Japan

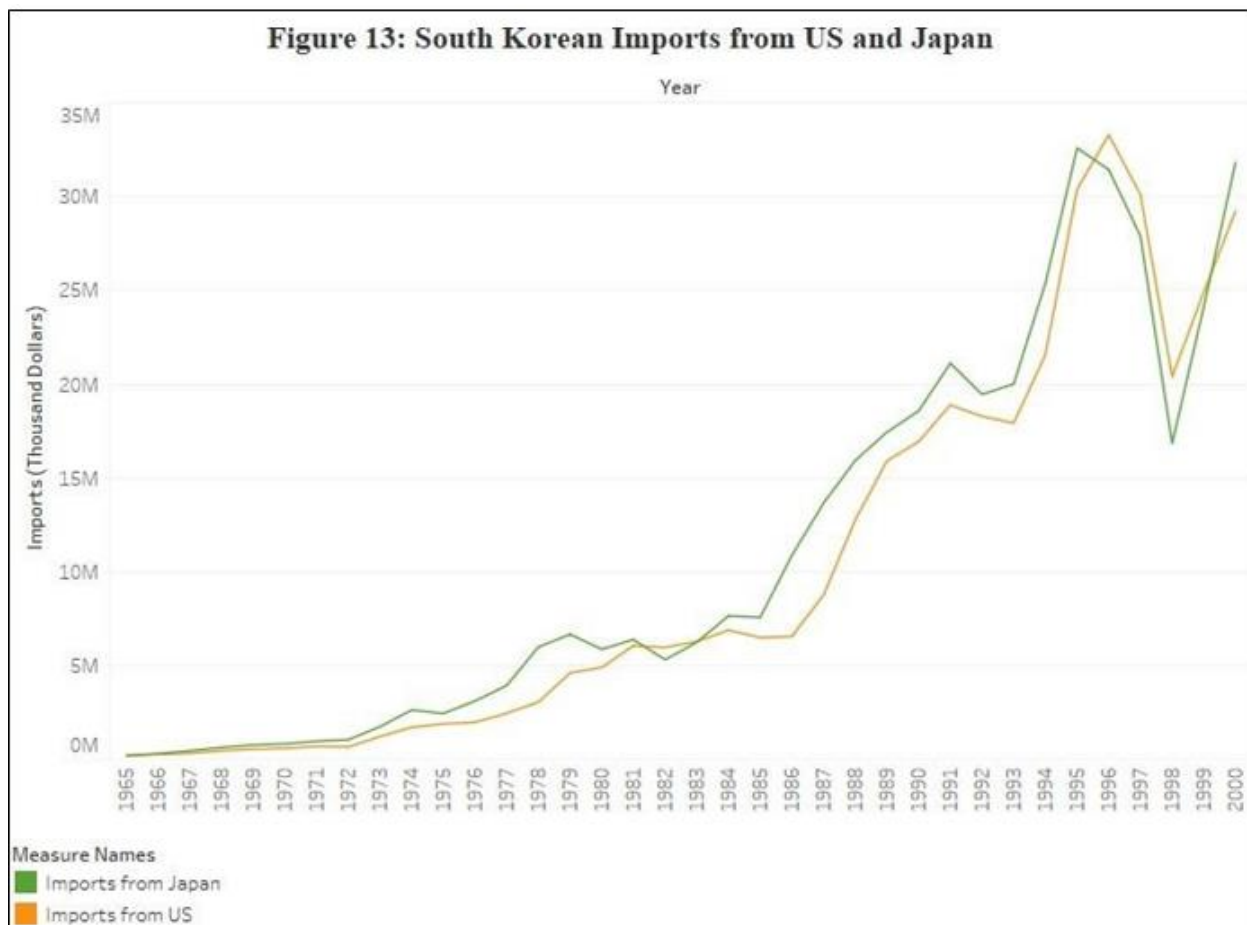
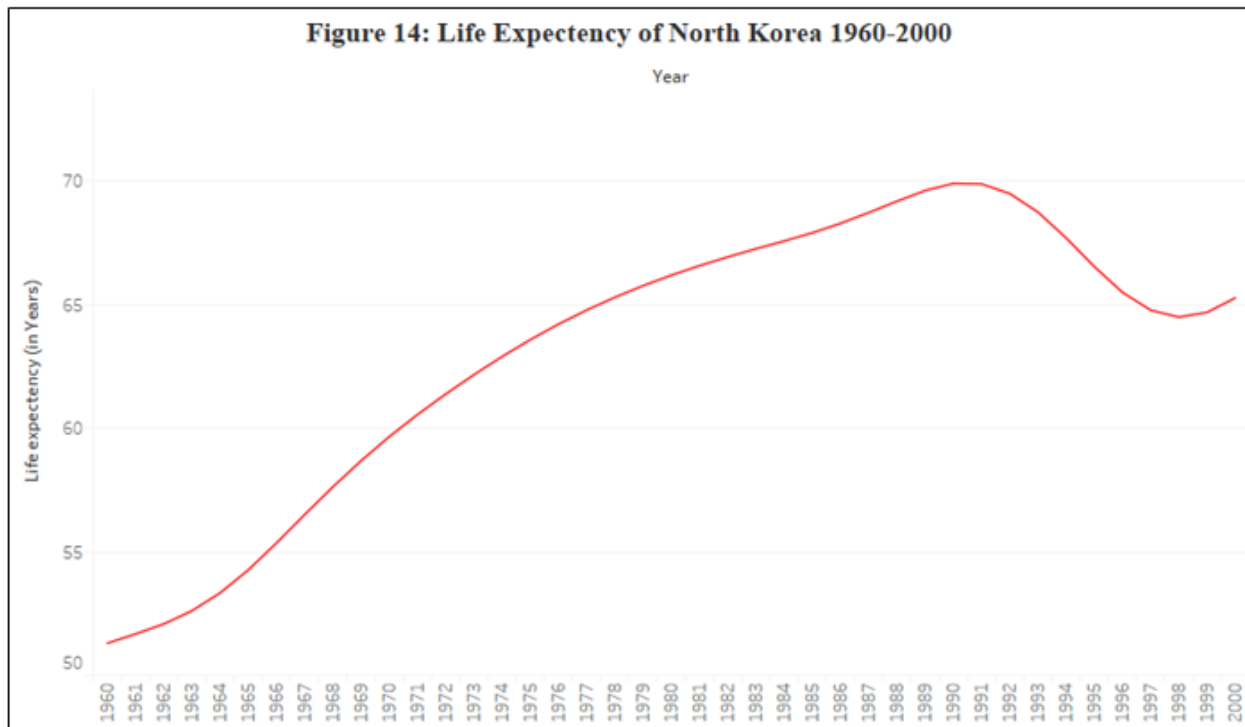


Figure 13 shows South Korea’s imports from Japan and US from 1965-2000. As seen from the figure, the imports tend to rise rapidly from 1967 and have shown an overall upward trend since. The imports grew rapidly from 1967, as this year marks the beginning of the second five year plan (1967-1971) of South Korean government. The major aim of this plan was to attract foreign

investment in the country. President Park also opted to import technology for the growth of South Korean industries from former colonial rulers Japan. This worked wonders for them as the South Korean industries equipped with latest Japanese technology started producing goods efficiently and soon became global leaders and hence boosting the economy for good.

#### 4. Life Expectancy in North Korea



The decrease in the life expectancy of the North Korean people gives us an idea of the extent of the impact the famine had on people's lives. As seen in the figure 14, the life expectancy took a severe hit from the onset of 1991, the same year when USSR collapsed and left North Korea completely abandoned. The fall continued till the end of the 20th century, because North Korea was faced with the challenge of The North Korean Famine from 1994-98.

#### Acknowledgement

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