Charles Thompson

# The Impact of British Hegemony on World Trade

Senior Thesis
Prof. M. Naples
spring 2013

Charles Thompson

# Induction and Literature Review

This paper seeks to take an empirical look at the relationship between of British Hegemony, and international trade, from the mid-19th to early 20th century. The specific years under consideration are 1860 to 1938. The year 1860 was chosen to be the start date due to data considerations. 1938 was chosen as the end date, since it is the last year before the outbreak of world war two. After 1938, there were significant changes in the structure of military power (the inclusion of aircraft and nuclear weapons), which make the model of naval power obsolete. Furthermore, other statistics become difficult to find for these years, due to the war, and the system of world trade becomes greatly distorted.

Much of this paper's structure comes from the hegemonic stability theory. In this theory a hegemonic power rises. A power is considered hegemonic if it occupies primacy in a number of areas, such as politics, military power, and economic strength. Generally, they are credited with promoting a peaceful international world system of mutual cooperation.

The first modern scholarly work on hegemonic stability theory was done by Robert Keohane in his book, *After Hegemony: Cooperation and Discord in the World Economy*, written in 1984. Of course the notion of hegemony was not a new topic, but much of the modern debate goes back specifically to this book. *After Hegemony* discusses the post war cooperation between major western states, noting that it is particularly unusual.[1] The relist school of thought argued that a hegemonic power was important to force world cooperation. Keohane, however, argues that "although hegemony can facilitate cooperation, it is neither a necessary nor sufficient

[1] *After Hegemony* 9

condition for it."[2] Instead, he argues by applying game theory, rational choice theory, and collective goods theory that international institutions can cause a world system of cooperation to develop. The crux of his argument is that this theory is applicable to the United States period of hegemony, which he cites as lasting from the marshal plan in 1947, to the 1960's. He also believed that the institutions that US has set up, would help preserver international cooperation long after the US's actual power faded. Ironically, a short 6 years after the publishing of his book, the Soviet Union fell, and the world entered a period of ten years of near total US dominance.

Following Keohane, the next major influence on the hegemonic stability theory was the Long Cycle theory. The Long Cycle theory, as argued by George Modelski, has a fairly straight forward premise. Modelski detailed his argument in his 1987 book, *Long Cycles in World Politics*. At periodic points in world history, usually proceeded by a war, a hegemonic power rules the world for periods of up to a hundred years. This leader also has a sense of legitimacy to them, establishing rules for other nations to follow.[3] At the end of the era, a major conflict breaks out and after a period of discord, a new hegemon arises. Again this is not exactly new thinking; however George Modelski's work represents its most recent iteration, and he uses modern theory to present it. Modelski established several such periods; a summery is given on Table 1.

Of particular interest to this paper, is the notion of the free rider problem in the hegemonic stability model. As summed up in "The Limits of Hegemonic Stability Theory" by Duncan Snidal, it is suggested that England's navy was critical in maintaining an open world system. This benefited England, who could use her economic superiority to unload cheep goods

[2] *After Hegemony* 12
[3] Long Cycle Theory and International Relations 285

on competitors. However, it also benefitted smaller powers which no longer had to invest in their navies to secure foreign waters. Thus, they got to free ride off England's efforts.[4]

Another frequently suggested argument is that the hegemonic power poses economic superiority. This is in line with the Social Structures of Accumulation (SSA) argument. I This theory was most famously expressed by David Kotz, Terrence McDonough, and Michael Reich in their work *Social Structures of Accumulation: The political economy of growth and crisis*. A social structure of accumulation is an alignment of economic, political and social conditions or methods which lead to a period of prolonged stable growth.[5] This theory is at odds with the neo-classical model, which assumes long term stability despite short term fluctuations in the market. Be that as it may. the validity of the SSA model Vis-à-vis the neoclassical model is not the issue. We must for now assume it to be plausibly true, and ask how it would explain fluctuations in British trade. For the British the SSA revolved around a political environment favorable to economic activity by the middle class, use of steam power, cheep factory labor, and capitalistic investment. While the model itself was never intended as an explanation about hegemonic stability, it has been used by many hegemonic theorists. They connect the long swings in the capitalist economic model, with the rise and fall of hegemonic powers.

Others have seriously questioned many of the aspects of hegemonic stability theory. They do this both by historical examination, and though qualitative analysis of many of the predictions of the model. The question of US hegemony in particular, has attracted much empirical research. This is both due to its more immediate applicability to the modern world, and simply due to the fact that data is more plentiful, and more accurate in the post World War II era.

[4] The Limits of Hegemonic Stability Theory 585
[5] Kotz etc *Social Structures of Accumulation* 11

A good example of empirical work is done in Michael C. Webb and Stephen D. Krasner in their 1989 article titled “Hegemonic Stability Theory: An Empirical Assessment.” The authors make a few interesting observations about the results of their data. They note a general decline in United State’s hegemonic position, based on several economic indicators, such as, relative share of the global economy, and FDI. The decline starts at the end of the 1960’s, before leveling out in the mid 1970’s. In spite of this, they found the open world system continues to operate, and in fact, has become more open. This would suggest a hegemonic power is not necessary for maintaining an open world system. As such, it is in line with Keohanes argument.

Comparatively less empirical work has been done on the period of English Hegemony. This is due in part to the difficulty in collecting data discussed below. The other reason may stem from a feeling that it is less immediately relevant. However, this is an improper conclusion as the real crux of the model suggests long term patterns which are replicated throughout history. Therefore, in order in order to test the accuracy of this model all periods of hegemonic stability are relevant for study. They in fact, must be studied.

# Data

For those who work with it, historical data is notoriously difficult. There are holes, inconstancies, and any conclusions must be taken with a grain of salt. That being said, more historical statistics have been made available in recent years. This has come about through a combination of a careful examination of records, and methods of estimation. This paper uses three main sources for its data.

The first source is Brian Mitchell's *International Historical Statistics*. The work is divided into three areas of the world: Europe, The Americas, and Africa, Asia, and Oceana. The work itself has been cited across a number of academic and research publications. It has been periodically updated, most recently in 2004, since its first publishing in 1994. It is widely

regarded as the best and most accessible set of statistics available. In specific, the statistics which were used from this were midyear estimates of population in millions, production of coal in millions of metric tons, imports and exports of coal by main surplus and deficit countries in millions of metric tons, and gross imports in domestic current values.

The second important source used was Global Financial Data (GFD), accessed from https://www.globalfinancialdata.com/index.html. Global Financial Data is a private firm who specializes in providing electronic data about global finical indicators, such as exchange rates, stock market prices, and interest rates. Much, though by no means all, of their data have estimates which go back into the 19th century at least. Like Mitchell, GFD is a well regarded source for academic historical statistics. It is also the only place the author of this paper was able to find exchange rate data.

The final source was a set of books called *Conway's All the World's Fighting Ships*. There are three volumes in the set broken up by year, with the first running from 1860-1905, the second from 1906-1921, and the third from 1922-1946. The ships are listed chronologically by nation and class (i.e. capital ship, cruiser, destroyer). Each entry includes information in a small table about the ship, including its builder, its date of launch, and its fate. This is usually followed by a descriptive text. Since there is no count of ships in a given year beyond the first, it was necessary to tally when all the ships were launched, and then decommissioned, or sunk by hand.

The 19th century witnessed the emergence of several great powers. These include The British Empire, France, The German Empire, The Austrian Empire (which became the Austro-Hungarian Empire), The Russian Empire, The United States, and Japan. There were also other major powers such as Italy, Portugal, Spain, Belgium, the Netherlands, and the Ottoman Empire, who, while they were not great powers, often held overseas colonies, and some substantial measure of economic power.

That being said, several problems emerged with trying to include most of these nations. To start with, the German Empire did not formally exist until 1871, when Kaiser Wilhelm I was crowned as such after Prussia's victory in the Franco-Prussian war. Of course the creation of a nation did not then occur overnight, thus there is no real data until well after this point in the 1880's. Before this, there is some data from the Zollverine, a trade union in which Prussia was the local hegemonic power, but this is evidently incomplete, as none of the sources used had it available.

Austria-Hungary, as the name might suggest, was comprised of several modern nation states, ethnicities, and languages. While it had existed for centuries before, the political boundaries in the years covered by this paper were by in large those set after the defeat of Napoleon. A rebellion of Hungarian nationalists caused the ruling Austrian Hapsburgs to allow Hungry to be a semi autonomous unit within the Empire. After the end of the First World War, its territorial area was broken up into many smaller states, in line with self determination of nations, one of Wilson's Fourteen Points. Hence, the movement of goods which before might have been internal only, suddenly now count as imports. The only way to resolve this would have been to either stop at 1914, or carefully piece together records for the various successor states, in order to discount their mutual imports. The first option is undesirable, as the analysis would then lack a period without supposed British hegemony for comparative purposes. The second option is also not desirable in the interests of time. Therefore, Austria simply had to be left out of the analysis.

Russia has questionably complete records at best, and often there are no records at all. The situation is made more complex by two post World War One events. First, a chuck of Russian territory was removed to form Poland after the war. Since some of Poland's area also came from Germany, another nation not included, it might distort results. Furthermore, in 1917 the Communists rose to power in Russia. They radically altered the economy, eventually trying

to take it off the price system all together. The number of changes, and the chaos they caused, means that the data is likely unreliable.

Many of the other minor powers had similar problems. Italy could not be included because she received substantial amounts of land from Austria. The Ottomans, much like their neighbor the Austrians, had their empire broken up into a larger number of successor states. Many of the other powers such as Portugal, Spain, and again the Ottoman Empire, simply have incomplete enough records to go off of.

In the end, only 5 nations were left which had both consistent data and stability in the area of their nation states. These were Great Britain, the United States, France, and Japan. The fifth nation is the Republic of Ireland, which broke off from Great Brittan in 1921.

# Variables and Predictions

The dependent variable will be the total amount of trade in the world. However, the question emerges as to how such a value should be measured. Data on tonnage is not as common as that on value, since it was usually value which was assessed and recorded for tariff purposes. Imports were chosen over exports for a similar reason. Since tariffs were a major source of revenue the imports of a nation were carefully accounted and recorded, thus, there is general acknowledgment of their better accuracy.

This leaves us with the next question of determining trade. Simply using import and export values is not reliable, since they would only indicate an upward trend as Europe industrialized and markets grew. Instead, this paper will use imports per capita as detailed in Figure 1.

The imports from all the nations in the study were put into a table. All import data was given in value of the local currency, in current years, in millions of metric tons. That is to say, the imports for France in 1860 were in 1860 Francs, those for Great Britain in the same year

were in 1860 British Pounds etc. They were then converted to USD via the exchange rate into yearly nominal USD. Once in yearly nominal USD, they were deflated by the wholesale price index, provided in Mitchell's *International Historical Statistics*, with a base year of 1910. The entire result was finally set over the total population for all of the nations chosen.

The hegemonic stability theory has two general hypotheses about the role of the hegemon's military power. The first of these two is important specifically for the 18th and 19th centuries. They suggest that England and her navy managed to keep the rest of the world's powers from expanding rapidly. This may or may not have been true in the 18th century, but it was certainly not true in the 19th. At any rate, the 18th century is beyond the scope of this paper.

The other important aspect which is argued is that the hegemon, in this case Great Britain, acted as a global police force. In this capacity they prevented major conflicts, patrolled against piracy, and essentially kept the channels of trade open. Since they were doing this other nations were able to "free ride" off of them, not needing to put as much money into their own navies while still earning the benefits. Modelski in particular counted only those powers who had the strongest navy as hegemonic.[6] In order to measure naval power, the ratio of Great Britain's ships, to the total world navy size was taken. The larger the navy the more effectively Great Britain could both defend her own homelands, and her distant colonies. She should in turn threaten the colonies of would be competitors, as well as blockade their ports to hurt their economies. Ideally this would not be the case, as other nations would then agree to negotiate rather than risk war. In exchange, they would gain the benefits of an open world system. Thus the naval coefficient is predicted to be positively related to imports per capita.

This paper acknowledges that this measure may not be entirely sufficient. The concept of military "power" is difficult to measure. It includes not only quantitative values, such as the number of ships, but also qualitative values, such as experience and training. For some categories

[6] Rosecrance, Richard Long Cycle Theory and International Relations 288

of ships such as gunboats, there were incomplete records and so they had to be discounted. An attempt was made to keep the ships all within a given tonnage however, to account for different nation's classification systems.

The second variable, the consumption of coal per capita, does not relate to the hegemonic stability theory per say. Instead it stands as a proxy for industrialization. During the 18th and 19th century, England experienced her industrial revolution. The key economic change in this revolution, particularly in the 19th century, was that capital was being leveraged to improve the marginal product of each worker. Steam was the dominate form of powering these new machines. The basic process involved heating water in a boiler and using that to turn a turbine. In order to effectively heat the water, it required coal in large sums. This is therefore a test of the SSA model, as Great Britain's SSA was adopted by other nations.

Coal is set over population, again to insure stability over the time period. Coal was also used to heat homes and for transportation. Therefore, a simple increase in population might cause an increase in the amount of coal consumed. While it was typically anthracite coal which was burned for heat purposes, no nation except the United States, seemed to indicate what sort of coal was being produced. Even then, the import and export statistics do not give indication as to the type of coal, only the tonnage. That being said, it remains the most reasonable proxy for industrialization when faced with a lack industry of statistics. It is expected to be positively related to the imports per capita, as the more industrial production, the cheaper the goods, and the more imports.

The opening of both the Suez, and Panama Canals, are represented by dummy variables which start the year the open. The Suez Canal connects the Red and Mediterranean Seas. While an ocean route around Africa was possible, it was a lengthy process. There was also another alternative route, which involved taking a train from Suez, to Alexandria. This alternative, however, meant that goods had to be offloaded and then unloaded to a second ship on the other

side. The opening of the canal therefore, greatly cut the distance and speed with which goods could travel.

The French firm responsible for the Suez Canal then tried to cut one through Panama but went bankrupt. The US government took over the project, and the canal opened in 1914. The Panama Canal allowed the industrialized US East Coast better access to the major markets in Asia, such as China and India. Once again, it greatly cut transportation costs. Both the canals should exhibit a positive correlation to imports as lower transportation costs meant the price of imports, relative to domestic goods, become cheaper.

The scramble for Africa denotes a period of roughly 15-20 years in which the European powers extensively colonized Africa. Previously, European nations had held some small colonies on the African coast, but had failed to colonize the interior. A number of important inventions such as quinine to fight malaria, Maxim Machine gun, and improved steam ships, all allowed for a sudden burst of colonization.[7] In 1884, the European powers met in Berlin to formally divide up the African continent, naturally the African's were not invited. For the first time in a long time, England was forced to negotiate multilaterally on a major international issue. This would happen again in China after the boxer rebellion. While Great Britain maintained the largest overseas empire, from now, on her almost single domination over wider world affairs was not nearly as secure. Since the hegemonic stability model claims the British political "clout" was essential for maintain an open world system, the scramble for Africa should exhibit a negative correlation with imports.

Finally, the effect of wars is estimated by the use of a dummy variable. If on a given year there was a war between two or more major powers, the value of 1 was given for that year, if not it received a value of 0. In theory, a war might increase demand for goods, and therefore imports, in order to support the war effort. However, it could also be generally disruptive to the

[7] Headrick, Daniel Power Over Peoples 249

world trading system. The first would imply a positive correlation, the second a negative. The predictions for all independent variable's signs can be found in table 2

# Initial results

The data was run though the statistical package STATA, and the results returned. The initial results are summarized in Table 3 in the appendix. There was unsurprisingly positive autocorrelation; however, this was corrected with a Prais–Winsten command. An initial graph of the dependent variable suggested there might be a time trend (Figure 2). Therefore a Dickey-Fuller test was run to determine if the data was stationary. The data was indeed stationary at all confidence intervals (table 5)

Most of the coefficients were as predicted, though Scramble was positively correlated. Neither War not Scramble were significant at any level. Navy and Suez were both significant only at the 90% level. Panama was significant at the 95% level, and Coal was significant at the 99% level. Overall though the F-stat was significant at the 99% and the adjusted $R^2$ value was from 0.44. (Table 3)

The regression was run again, this time without either the Scramble or War dummy variables. Again, positive autocorrelation was detected, and then corrected with a Prais–Winsten command. The model improved by all measure. Those variables which remained, Navy, Coal, Suez, and Panama, were now all significant at the 99% level. The F stat remained significant, and the $R^2$ value increased from 0.44 to 0.79. (Table 4)

The Scramble for Africa was not a statistically significant. Either England's need to negotiate multilaterally did not affect her position as a world leader, or she did not have that position during the time studied. Alternately, it may have been that this was too clumsy of a

proxy variable, and that a more detailed look. An example would have been to examine the ratio bilateral to multilateral treaties signed by England.

Weather there was a war on a given year was also not statistically significant. This seems reasonable as, except for World War One, most conflicts were local, land based, and short in duration. It is little wonder that most people expected World War One to be a short affair based on experience with pervious wars. It might have been better to use a dummy variable to control specifically for world war one based on the different nature of the conflict. Another option would have been to count only wars which involved those nations under consideration.

The size of England's Navy was statistically significant. It seems that her navy at least did promote some stability in international waters. Again, the statistic may be a bright broad, but it does suggest there is an important connection here. Future research might be more specific about the tonnage and armaments. Alternatively, comparing the British Navy to only the navies of neutral, or potentially hostile states, could be more enlightening. Yet another comparison might have been made between the size of the navy and factors such as the miles of coastline which must be defended.

The amount of coal consumed per capita was evidently a good indicator of the change in imports. This makes sense, since more factories could produce more goods at a cheaper price. Further, an increased demand for imports would result in the short term by factories running longer hours and therefore consuming more coal. Only in the long term would more factories be built. It is somewhat surprising just how well it fit the model, as one would imagine that by the end of the period under study, electricity generated by oil would be replacing coal as the main power source. However, it may just have been that firms preferred to wait until their capital had been consumed before investing in new technology.

Neither Suez nor Panama was a particular surprise. As mentioned both greatly cut the distances between two major centers of population and production. The canals, therefore, cut

transportation costs significantly. The Suez opened slightly too early perhaps for the dates in this model to detect a sizable difference. The Panama Canal statistic might have gained from the large increase in the dependent variable. The canal opened in 1914 at the start of World War One, just when the jump in imports occurred due to wartime demand.

With regards to the noticeable jump in imports occurring during the war year, there are two sources for the change. First, the war caused two nations, France and Great Britain, to increase their imports. The war effort consumed large numbers of good mostly due to destruction. At the same time, the productivity of both countries was reduced, by having large numbers of their working population being relocated on the front lines. The shortfall was made up for by imports, largely from the US. The gold standard was withdrawn in both countries to make payments for the war effort, sparking inflation. While the US also experienced inflation, it was not to the same magnitude. Hence, the price deflator is not entirely accurate during these years.

# Conclusions

There is some evidence from this empirical analysis that the presence of a hegemonic power does help in facilitating trade. That being said, other factors not necessarily connected to the presence of a hegemonic power, such as transportation costs, may also have an effect. Consistently the best performing variable was the consumption of coal per capita. This suggests that there is some weight behind the Social Structures of Accumulation model. The naval statistic was surprisingly useful. Even if England's navy was not directly employed to enforce her wishes throughout the century, the persistent threat may have been sufficient to spur foreign powers to negotiate.

The view that it is a hegemonic power which is responsible for all changes in a trade patterns is a bit simplistic in light of the strength of alternative explanations. Future research

should try to focus on both hegemonic, and non-hegemonic, aspects and ask questions related to causality. For example was it their SSA which allowed Britain to establish herself as a hegemonic power? Alternatively was it Britian's position as a hegemonic power allow it to establish a successful SSA based on overseas possessions.

Appendix

Figure 1

$$\frac{\sum \left(\frac{\text{nominal imports in domestic currency, in current year* USD current year exchange rate)}}{\text{Price deflator}}\right.}{\sum \text{(yearly population for all nations)}}$$

Figure 2

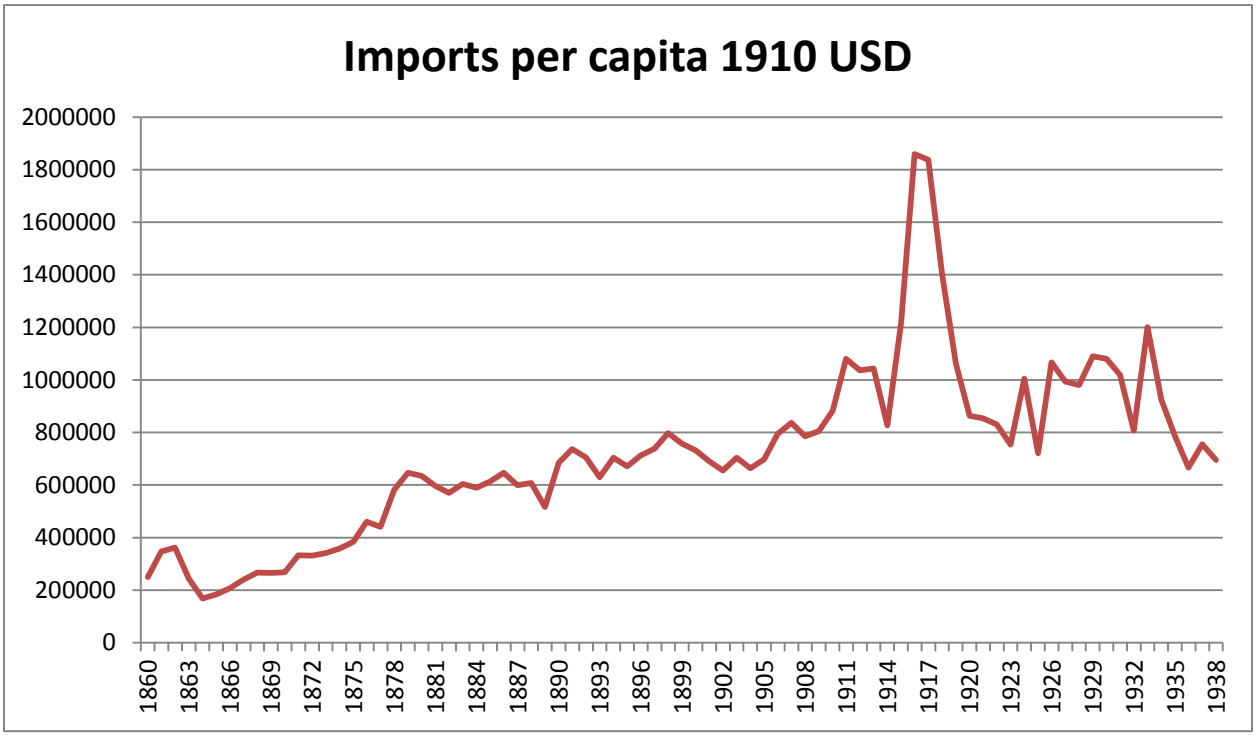

**TABLE 1.** *World events since 1494, according to Modelski*

| *Global war phase* | *World power phase* | *Phases of delegitimation and deconcentration*[19] |
|---|---|---|
| 1. 1494–1516 | 1516–1540 | 1540–1580 |
| France is the challenger during Italian and Indian Ocean Wars | Portugal is leader | |
| 2. 1580–1609 | 1609–1640 | 1640–1688 |
| Spain is the challenger during Spanish-Dutch wars | Netherlands is leader | |
| 3. 1688–1713 | 1714–1740 | 1740–1792 |
| France is the challenger during wars of Louis XIV | Britain is leader | |
| 4. 1792–1815 | 1815–1850 | 1850–1914 |
| France is the challenger again during Revolutionary and Napoleonic Wars | Britain is leader again | |
| 5. 1914–1945 | 1945–1973 | 1973–? |
| Germany challenges during World Wars | United States is leader | |

(from “Long Cycle Theory and International Relation”)

Table 2.

| Variable | Hypothesis |
|---|---|
| British Navy | $\beta > 0$ |
| Coal | $\beta > 0$ |
| Suez | $\beta > 0$ |
| Panama | $\beta > 0$ |
| Scramble For Africa | $\beta < 0$ |
| War | $\lvert \beta \rvert > 0$ |

Table 3.

| | Intercept | Navy | Coal | Suez | Panama | Scramble | War |
|---|---|---|---|---|---|---|---|
| Coefficient | -831551 | 2136899 | 225637.5 | 142589.9 | 236928.5 | 86508.82 | -2858.79 |
| T score | -1.4 | 1.44* | 3.73*** | 1.36* | 1.9** | 0.88 | -0.06 |
| F stat | 9.46 | | | | | | |
| Adjusted $R^2$ | 0.4408 | | | | | | |
| DW stat | 1.012421 | | | | | | |
| DW corrected | 1.82324 | | | | | | |
| n | 79 | | | | | | |
| k | 6 | | | | | | |

Table 4.

| | Intercept | Navy | Coal | Suez | Panama |
|---|---|---|---|---|---|
| Coefficient | -1437222 | 3515955 | 249710.5 | 214412.1 | 235968.5 |
| T score | -3.5 | 3.36*** | 7.64*** | 3.32*** | 4.15*** |
| F stat | 59.94 | | | | |
| Adjusted $R^2$ | 0.7642 | | | | |
| DW stat | 1.012421 | | | | |
| DW corrected | 1.82324 | | | | |
| n | 79 | | | | |
| k | 4 | | | | |

Table 5.

Dickey-Fuller test for unit root  Number of obs = 78

| | | ---------- Interpolated Dickey-Fuller --------- | | |
|---|---|---|---|---|
| | Test Statistic | 1% Critical Value | 5% Critical Value | 10% Critical Value |
| Z(t) | -2.345 | -3.541 | -2.908 | -2.589 |

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