Crude Oil Price: An Indicator of Consumer Spending

Natalie Li

Eva Lin

New York University

May 2015

Abstract

As the most major source of energy, crude oil has a significant impact on political and economic dynamics around the globe. The price of oil, therefore, directly and indirectly affects our daily lives. Higher oil prices reduce discretionary income while driving up prices of other consumer goods and services, thereby impacting domestic consumption. In this paper, we hypothesize that the real price of imported crude oil negatively influences personal consumption expenditure within the United States. To test the theory, we present a least squares model by regressing oil prices as well as other macroeconomic sets of time series data against personal consumption expenditure. The results indicate a structural change in 1980, aligning with the introduction of regulations for crude oil price control following the OPEC embargo. Our results are significant at the 99% confidence interval that real imported crude oil prices negatively impact real domestic consumer expenditure.

1 Introduction

According to the US Energy information Administration's (EIA) latest estimate for the first quarter in 2015, the world consumes around 91.13 million barrels of crude oil per day. As one of the major energy sources in the world, crude oil dominates as the subject of both domestic and foreign energy policy. Its importance lies in its chemical potential, which is harnessed by oil refineries to produce gasoline, heating oil, jet fuel and propane. Crude oil allows for effective transportation and efficient heating and electricity generation, defining the experience of modern-day consumers. Because of its crucial role in modern life, consumers view refined oil, such as gasoline, as an essential expense and therefore inelastic in demand with regards to price. Lower oil prices increase consumers' discretionary income via the income effect, thereby encouraging consumption in the economy. Higher oil prices, however, prompt the opposite to occur and decrease consumption. The price of oil is determined through global supply and demand, a delicate balance that, if disrupted, can have severe economic repercussions in the forms of low consumer confidence, high inflation, and an overall decrease in consumer spending.

The objective of this paper, therefore, is to examine the relation between oil prices and consumer spending in an oil-importing country: the United States. We hypothesize that the import price of crude oil has a negative impact on domestic personal consumption expenditure due to its microeconomic implications. The empirical methodology is to utilize the Ordinary Least Squares method to create a multivariable regression model in order to examine the United States from 1970 to 1995. The time period is carefully selected so that it covers the two oil price shocks in the 1970s, capturing an economy that is reliant on foreign oil and the restrictions it poses on domestic consumption expenditure.

Furthermore, we make necessary modifications to our model by modifying variables to avoid high multicollinearity, detecting structural changes by running the Chow Test, and implementing a heteroscedasticity test. The general expectation here is a negative correlation between real crude oil prices and real personal consumption expenditure.

2 Literature Review

As the major source of energy, crude oil is no doubt one of the most widely studied commodities in the global economy. It has been extensively researched and used as an indicator for economic forecasting. Numerous studies have examined the relations between the price of oil and the economy of oil-imported countries. Hamilton's (1983) study recognizes oil shocks as a contributing factor to economic downturns in the United States after World War II, suggesting an increase in oil prices could lead to a vast decline in total output. Some authors base their studies on foreign economies, stressing the impact of oil prices in the economy on a macroeconomics scale. Hanabusa (2009) investigates the relation between oil prices and economic growth in Japan. He suggests a causal relationship and argues that the price of oil is an important predicator of economic growth. TovarJalles (2009), on the other hand, analyzes the impact of oil prices on economic performance in France and notes that the price of oil has exerts less influence on macroeconomic variables as time progresses. Regarding oil prices and spending specifically, Odusami (2010) explains the short-term deviations of consumption, asset wealth and labor income from their long-term trend as a result of crude oil price fluctuations. He further recognizes consumption as a proportion of aggregate wealth, noting that as oil prices increases, the proportion of aggregate wealth consumed decreases. Odusami's (2010) study parallels with our hypothesis and provides a different angle to examine the crude price-consumption relation. Having investigated the causes of post-WWII oil shocks as well as their effects in the aftermath, Hamilton (2013) notes that price control is an important factor to be considered with the events of drastic oil price increases. He further points out that after the oil price spike in the 1970s caused by the embargo of Organization of Petroleum Exporting Countries (OPEC), there were numerous sets of elaborate regulations particularly introduced for oil price control. Interestingly, Hamilton (1983), Odusami (2009), and Petersen's (2005) studies all suggest weakening effect of oil prices on consumption after 1980, when the regulatory environment's effect came into the picture as oil prices started to fluctuate in different directions. Namely, the United States introduced a multitude of measures for further oil independence as a way of increasing economic stability. This allows us to test our theory in two separate periods-before and after the change in environment and movements of crude oil prices.

3 The Model

The model we use for this paper is a multivariable linear regression model that examines time series data. We study the time period from 1970 to 1995 and employ quarterly instead of annual data due to the volatile nature of crude oil prices. The model we will be estimating with Ordinary Least Squares method is introduced as the following equation:

$$PC_t = \beta_1 + \beta_2 OP_t + \beta_3 Z_t + \beta_5 P_t \tag{1}$$

where $Z_t = CPI_t + 0.6345CCI_t$

Variable Codes:

Dependent Variable:

- PC_t Real Personal Consumption Expenditures (billions of chained 2009 dollars)

Independent Variables:

- OP_t Real Imported Crude Oil Prices ($/barrel)
- Z_t - CCI and CPI Combination Variable
- P_t - Population Growth Rate (%)

Real Personal Consumption Expenditures Real Personal Consumption Expenditures is the dependent variable in our model. It is a measure of goods and services consumed by households, including durable goods, non-durable goods and services. There are two categories of personal consumption expenditures: real and nominal. Real values are inflation adjusted while nominal values are not. Here, for the convenience of comparison, we will be using Real Personal Consumption Expenditures in billions of chained 2009 dollars, seasonally adjusted.

Real Imported Crude Oil Prices Oil prices can be defined as the prices of crude oil, gasoline, or heating oil, etc. Since we are examining the movement in original oil price rather than the prices of refined products, which would reflect the price of manufacturing process, we will use real imported price of crude oil, in dollars per barrel, as an indicator of oil prices in our model. We expect its coefficient to be negative because consumers have less discretionary income as the price of oil increases.

Population Growth Rate Population growth rate is defined as the rate at which the number of individuals in a population increases. We assume that an increase in population growth rate will lead to an increase in personal consumption expenditure, as there are more people to consume in the economy; in other words, the coefficient of P is expected to be positive. However, in a rare case where population growth rate is decreasing, yet the total population still remains higher than the initial population, the coefficient of P could be negative. The formula to derive P is the following:

$$P = \frac{Population\ of\ year\ t - Population\ of\ start\ year}{Population\ of\ start\ year} \tag{2}$$

Consumer Confidence Index CCI is a surveyed indicator to measure consumer's optimism in state of the economy in the present and near future. Consumers have two options facing their disposable income: to consume or to save. When consumers feel more confident and optimistic, they tend to spend more on goods and services than they save. As a result, CCI is expected to have a positive impact on personal consumption expenditure.

Consumer Price Index CPI measures the weighted average change in the price level of consumer goods and services purchased by households. The US Bureau of Labor collects two types of CPI data: CPI for Urban Wage Earners and the Chained CPI for All Urban Consumers. Since CPI for Urban Consumers represents a larger population in the general public, we will be using this set of CPI data in the model. In theory, an increase in the price level leads to inflation, causing interest rates to fall and encouraging consumers to spend rather than save because of the relatively low return from savings. Therefore, we expect a positive relationship between CPI and personal consumption expenditure.

Consumer Confidence Index and Consumer Price Index Combination Variable Due to the strong correlation of CCI and CPI, we obtain estimate of $\beta_4 = 0.6345\beta_3$ from cross section analysis and introduce a combined variable Z (=CPI+0.6345CCI) in our regression model to resolve the problem of muticollinearity. Doing so will allow us to estimate the combined effect of CCI and CPI on personal consumption expenditure rather than the individual effects.

4 Data

The data is in this paper is shown in Table 4.1. The five sets of data were extracted from several database sources online. From the website of US Energy Information Administration (AIE), we accessed quarterly data of real imported crude oil price from 1974 to 1980 and annual data from 1970 to 1973, the latter of which was repeated four times to fit into our quarterly data format. We were also able to collect the data of real personal consumption expenditure and CPI on the website of the Federal Reserve Bank of St. Louis (FRED) under Real Personal Consumption Expenditures and Consumer Price Index for All Urban Consumers. The population growth rate data is available on the website of the World Bank in annual form. We intentionally repeated annual data four times as an adjustment in order to align our data sets. As for the CCI data from the Organization for Economic Co-operation and Development, which is collected monthly, it was manually transformed into quarterly data by averaging every three month's figures. Note that the data of Z was calculated as $CPI_t + 0.6345CCI_t$.

5 Results

The estimated regression line of our model from 1980Q1 to 1995Q4 is given as the following equation:

$$PC_t = 393.6859 - 5.70934OP_t + 28.1758Z_t - 4.6115P_t \tag{3}$$

As shown in Table 5.1, the R^2 in this model is extremely high with a value of 0.980394, which suggests that the independent variables in this model explains roughly 98% of the variation in the real personal consumption. As for the estimates, the intercept is significant yet posses no economically meaningful interpretation since the oil price, CCI, CPI, and population growth rate are unlikely to be zero at the same time. The signs of OP and Z coefficients are as expected, indicating a negative impact of oil prices and a positive combined CCI-CPI impact on personal consumption. Nonetheless, the results also indicate problems that need to be examined. With 104 observations, population growth rate's t value of -0.038988 implies that P is not statistically significant in this model.

In order to improve the model, we ran a Chow Test for 1980Q1 as it is suspected to be the turning point in oil price history. As seen in Table 5.2, the test result is significant and thus implies the presence of an appropriate structural break point in our time series model. In other words, regression on subintervals of [1970Q1, 1979Q4] and [1980Q1, 1995Q4] gives a better modeling than the regression over the whole interval of [1970Q1, 1995Q4]. As a result, we will proceed by running the regressions of the two time periods separately. The estimated regression line of our model from 1970Q1 to 1979 Q4 is introduced in the equation below:

$$PC_t = -5.7027 - 6.0451OP_t + 39.2359Z_t - 772.7508P_t \tag{4}$$

As seen in Table 5.3, the regression of this subinterval also achieves a high R^2 of 0.981958, or 98% of explained variation in PC. Furthermore, all the estimates for the exogenous variables are significant on 99% confidence interval according to the t-test results. The negative sign of OP confirms our hypothesis and indicates about a 6.05 billion dollar decrease in Personal Consumption Expenditure with every one-dollar increase in per barrel oil prices. As expected, the coefficient of Z indicates a positive combined CCI-CPI impact on consumption. The negative sign of the population growth rate, however, does not match up with our original expectation based on the theory of larger population makes more consumption. Yet as we compare Graph 6.1 and Graph 6.3 from 1970 to 1979, it is true that as Personal Consumption Expenditure exhibits a rising trend, population growth rate was decreasing during the period. This could be explained by the slower yet steady increase in total US population, referring to Table 6.4 from the US Census Bureau. The intercept in this regression is not significant; however, we are not going to further interpret it because it has no intrinsic meaning in our model. One potential problem in this regression could be heteroscedasticity. In order to investigate, we plot the residuals, as shown in Graph 5.1. Since the residuals are roughly evenly scattered, we conclude that heteroscedasticity is not a major problem in this regression. The overall performance of this model for the subinterval of [1970Q1, 1979Q4] is quite satisfactory.

For the second subinterval, we run regression with data from 1980Q1 to 1995Q4. The second estimated regression line of our model is given as the following equation:

$$PC_t = -567.8053 - 4.3630OP_t + 34.3119Z_t - 428.4218P_t \tag{5}$$

As seen in Table 5.4, we again get a large R^2 of 0.979784. On average, every dollar per barrel increase in OP is estimated to lead to a decrease of around 4.36 billion dollars in Personal Consumption Expenditures. This is smaller than our estimation of the OP coefficient for the period of 1970 to 1979 of 6.05 billion dollars, demonstrating the effect of a structural break caused by the U.S. policy changed for greater energy independence in 1980. Every unit increase in Z, on the other hand, is estimated to have a positive impact of around 34.31 billion dollar increase on consumption expenditures. Although the coefficients of OP and Z have the right signs and are both significant at a 99% confidence interval, P turns out to be only significant at a 90% confidence interval. We then plot the residuals for this subinterval to test heteroscedasticity. Graph 5.2 displays an abnormal distribution; the residuals exhibit a heteroscedastic pattern. In order to improve on the model, Whites Correction for Heteroscedasticity is implemented. Comparing Table 5.5 and Table 5.4, however, one can see that the results are not immensely improved: the intercept and P remain insignificant. This might be a result of the irrelevance using population growth rate instead of total population or an outcome of muticollinearity among our macroeconomic exogenous variables. The regression results of the second subinterval in this model are not as satisfactory, yet we achieved our objective of examining oil prices-consumption relation. We have seen significant and negative OP estimates in all of the regressions we run throughout the study, which support our hypothesis that oil prices do exert an influence on personal consumption decisions.

6 Conclusions

This paper helps us understand one of the factors that affect consumer-spending decisions—the price of oil. It provides empirical evidence that increases in oil prices have a negative effect on consumer spending. The result is reached by running a multiple linear consumption model, with relevant macroeconomic factors as exogenous variables. This study aligns its finding with other earlier research that a structural change occurs in 1980, altering the relationship between oil prices and consumer expenditure. Under the model with two subintervals before and after 1980 —the price of real imported crude oil negatively impacts personal consumption in both time periods. The latter period, however, shows oil price as a weaker influence on consumer spending as compared to the former. This is consistent with the increased regulatory changes regarding oil price control by the United States around 1980. The study does not capture the relation between population growth and consumption expenditure. Theoretically, population growth should have a positive effect on consumer spending, yet the model indicates that it has no significant impact. Perhaps using population instead of population growth rate as one of the dependent variables would improve the model and give better results. Overall, the model has produced a satisfactory result that demonstrates the impact of crude oil prices as an indicator of consumer spending.

7 Appendices

Figure 1: Table 5.1

Dependent Variable: PC
Method: Least Squares
Sample: 1970Q1 1995Q4
Included observations: 104

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	393.6859	144.382	2.726696	0.0076
OP	-5.709338	0.738754	-7.728339	0
Z	28.17584	0.42875	65.71631	0
P	-4.611511	118.2801	-0.038986	0.969

R-squared	0.980394	Mean dependent var	4527.654
Adjusted R-squared	0.979806	S.D. dependent var	1089.026
S.E. of regression	154.7573	Akaike info criterion	12.9593
Sum squared resid	2394983	Schwarz criterion	13.061
Log likelihood	-669.8834	Hannan-Quinn criter.	13.0005
F-statistic	1666.828	Durbin-Watson stat	0.08093
Prob(F-statistic)	0		

Figure 2: Table 5.2

Chow Breakpoint Test: 1980Q1			
Null Hypothesis: No breaks at specified breakpoints			
Varying regressors: All equation variables			
Equation Sample: 1970Q1 1995Q4			
F-statistic	38.29507	Prob. F(4,96)	0
Log likelihood	99.19816	Prob. Chi-Squ	0
Wald Statistic	153.1803	Prob. Chi-Squ	0

Figure 3: Table 5.3

Dependent Variable: PC
Method: Least Squares
Sample: 1970Q1 1979Q4
Included observations: 40

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5.702674	142.3384	-0.040064	0.9683
OP	-6.045118	0.832232	-7.263739	0
Z	39.23592	1.415224	27.72418	0
P	-772.7508	93.05922	-8.30386	0

R-squared	0.981958	Mean dependent var	3446.428
Adjusted R-sc	0.980455	S.D. dependent var	354.0456
S.E. of regres	49.49738	Akaike info criterion	10.73636
Sum squared	88199.66	Schwarz criterion	10.90524
Log likelihood	-210.7271	Hannan-Quinn criter.	10.79742
F-statistic	653.116	Durbin-Watson stat	0.96979
Prob(F-statist	0		

Figure 4: Table 5.4

Dependent Variable: PC
Method: Least Squares
Sample: 1980Q1 1995Q4
Included observations: 64

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-567.8053	369.0648	-1.538498	0.1292
OP	-4.362893	1.434718	-3.040942	0.0035
Z	34.3119	2.24424	15.28887	0
P	-248.4218	150.7624	-1.647771	0.1046

R-squared	0.979784	Mean dependent var	5203.42
Adjusted R-sc	0.978773	S.D. dependent var	809.4565
S.E. of regres	117.9333	Akaike info criterion	12.43858
Sum squared	834496.2	Schwarz criterion	12.57351
Log likelihood	-394.0345	Hannan-Quinn criter.	12.49173
F-statistic	969.312	Durbin-Watson stat	0.144586
Prob(F-statist	0		

Figure 5: Table 5.5

Dependent Variable: PC
Method: Least Squares
Sample: 1980Q1 1995Q4
Included observations: 64
White heteroskedasticity-consistent standard errors & covariance

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-567.8053	310.5748	-1.82824	0.0725
OP	-4.362893	1.023266	-4.263694	0.0001
Z	34.3119	2.273199	15.0941	0
P	-248.4218	156.364	-1.58874	0.1174

R-squared	0.979784	Mean dependent var	5203.42
Adjusted R-sc	0.978773	S.D. dependent var	809.4565
S.E. of regres	117.9333	Akaike info criterion	12.43858
Sum squared	834496.2	Schwarz criterion	12.57351
Log likelihood	-394.0345	Hannan-Quinn criter.	12.49173
F-statistic	969.312	Durbin-Watson stat	0.144586
Prob(F-statist	0	Wald F-statistic	868.9007
Prob(Wald F-:	0		

Figure 6: Graph 5.1

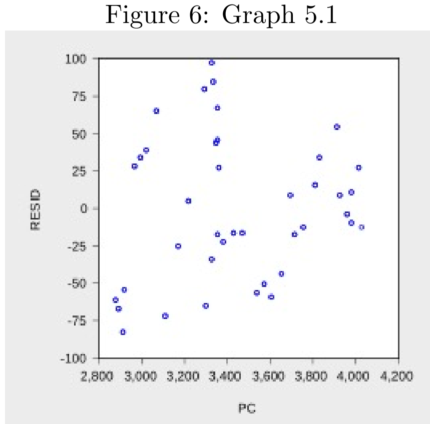

Figure 7: Graph 5.2

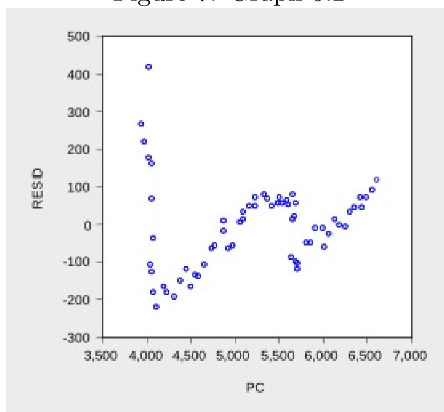

Figure 8: Graph 6.1

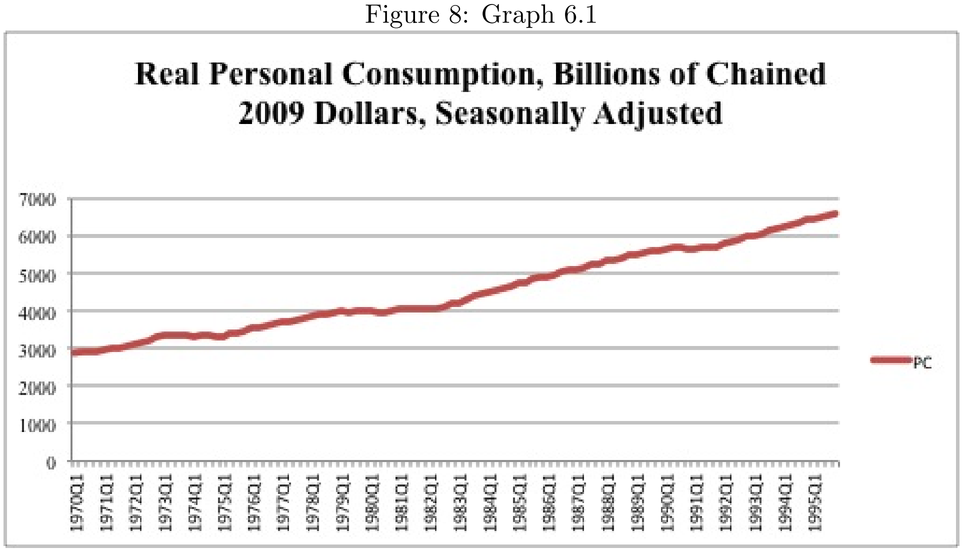

Figure 9: Graph 6.2

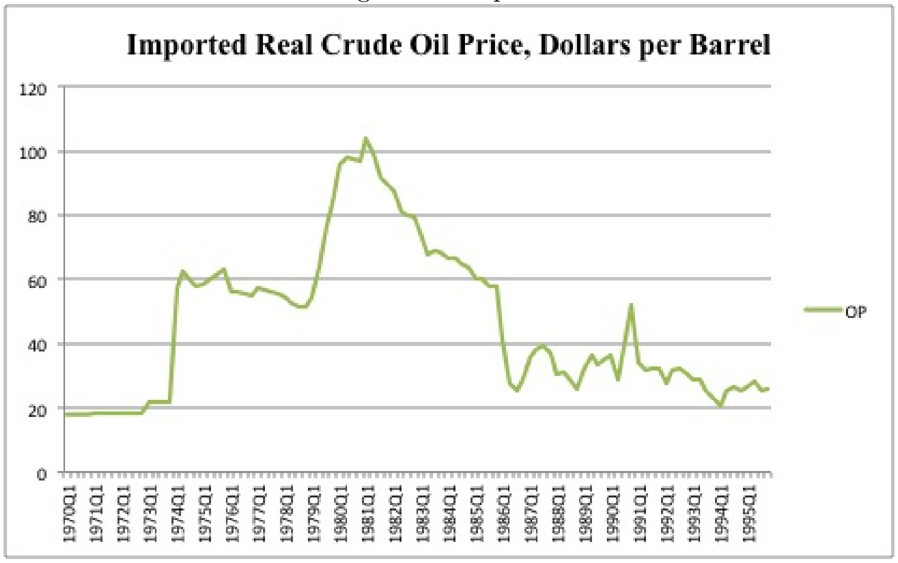

Figure 10: Graph 6.3

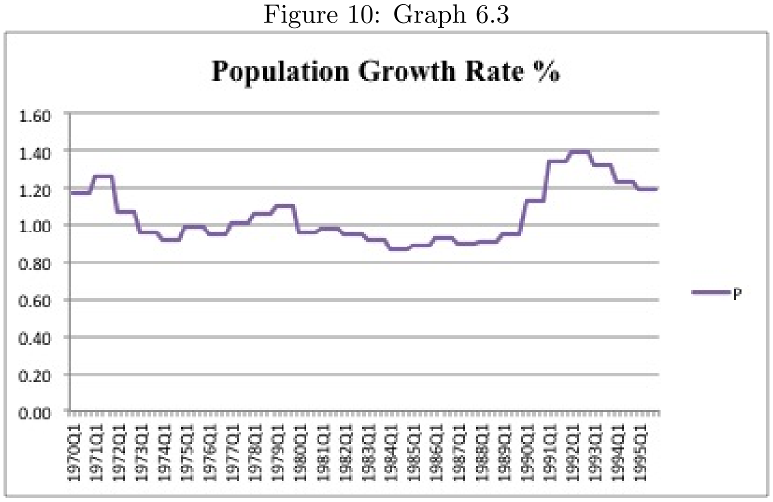

Figure 11: Graph 6.4

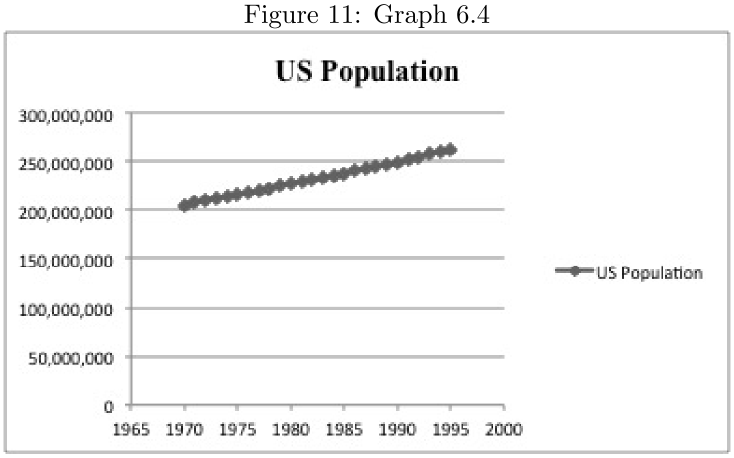

Figure 12: Table 4.1

Quarter	OP	P	CCI	CPI	PC	Z
1970Q1	17.970	1.165	98.926	38.100	2882.300	100.868
1970Q2	17.970	1.165	98.838	38.633	2895.600	101.345
1970Q3	17.970	1.165	98.736	39.033	2921.100	101.681
1970Q4	17.970	1.165	98.642	39.600	2913.100	102.189
1971Q1	18.430	1.264	99.108	39.933	2968.900	102.817
1971Q2	18.430	1.264	99.373	40.300	2996.100	103.352
1971Q3	18.430	1.264	99.499	40.700	3020.000	103.832
1971Q4	18.430	1.264	99.992	41.000	3070.200	104.445
1972Q1	18.140	1.071	100.553	41.333	3110.800	105.134
1972Q2	18.140	1.071	100.624	41.600	3170.200	105.446
1972Q3	18.140	1.071	100.858	41.933	3219.100	105.927
1972Q4	18.140	1.071	100.187	42.367	3294.600	105.936
1973Q1	21.640	0.955	99.315	43.033	3354.800	106.040
1973Q2	21.640	0.955	98.705	43.933	3353.400	106.561
1973Q3	21.640	0.955	98.552	44.800	3365.300	107.331
1973Q4	21.640	0.955	98.171	45.933	3355.300	108.222
1974Q1	57.425	0.914	97.645	47.300	3326.200	109.256
1974Q2	62.786	0.914	97.942	48.567	3337.900	110.711
1974Q3	59.705	0.914	97.244	49.933	3351.600	111.634
1974Q4	57.631	0.914	96.744	51.467	3302.500	112.851
1975Q1	58.353	0.906	97.285	52.567	3330.100	114.294
1975Q2	60.129	0.986	98.478	53.200	3385.700	115.684
1975Q3	61.232	0.986	98.732	54.267	3434.100	116.925
1975Q4	63.229	0.986	99.150	55.267	3470.500	118.177
1976Q1	56.256	0.950	99.716	55.900	3539.900	119.170
1976Q2	56.070	0.950	99.966	56.400	3572.400	119.829
1976Q3	55.567	0.950	100.274	57.300	3610.300	120.924
1976Q4	55.076	0.950	100.122	58.133	3657.500	121.660
1977Q1	57.226	1.006	100.251	59.200	3699.300	122.809
1977Q2	56.845	1.006	100.424	60.233	3719.700	123.952
1977Q3	56.064	1.006	100.146	61.067	3755.200	124.610
1977Q4	55.632	1.006	99.755	61.967	3811.800	125.262
1978Q1	54.194	1.060	99.557	63.033	3833.800	126.202
1978Q2	52.921	1.060	99.440	64.467	3915.600	127.562
1978Q3	51.746	1.060	99.299	65.967	3932.000	128.972
1978Q4	51.546	1.060	98.594	67.500	3963.500	130.050
1979Q1	54.160	1.104	98.130	69.200	3983.600	131.463
1979Q2	63.479	1.104	97.649	71.400	3981.300	133.359
1979Q3	76.777	1.104	97.358	73.700	4020.400	135.474
1979Q4	83.413	1.104	97.323	76.033	4031.200	137.784
1980Q1	95.737	0.960	97.107	79.033	4025.000	140.648
1980Q2	98.308	0.960	96.361	81.700	3934.100	142.841
1980Q3	97.534	0.960	97.788	83.233	3976.900	145.279
1980Q4	96.685	0.960	98.376	85.567	4029.600	147.987
1981Q1	103.706	0.981	97.908	87.933	4050.800	150.055
1981Q2	99.099	0.981	98.480	89.767	4050.100	152.253
1981Q3	91.718	0.981	98.586	92.267	4066.400	154.820
1981Q4	90.036	0.981	97.746	93.767	4035.900	155.787
1982Q1	87.320	0.953	97.599	94.600	4062.600	156.526
1982Q2	81.443	0.953	97.563	95.967	4077.600	157.871
1982Q3	79.977	0.953	97.772	97.633	4109.100	159.669
1982Q4	79.569	0.953	98.262	97.933	4184.100	160.280
1983Q1	72.819	0.914	98.871	98.000	4224.800	160.734
1983Q2	67.938	0.914	100.519	99.133	4308.400	162.912
1983Q3	68.883	0.914	100.606	100.100	4384.000	163.935
1983Q4	68.398	0.914	100.730	101.100	4453.100	165.013
1984Q1	66.334	0.866	101.453	102.533	4490.900	166.905
1984Q2	66.423	0.866	101.325	103.500	4554.900	167.791
1984Q3	65.148	0.866	101.430	104.400	4509.900	168.750
1984Q4	63.837	0.866	101.154	105.300	4650.600	169.482
1985Q1	60.407	0.886	100.950	106.267	4729.700	170.320
1985Q2	60.375	0.886	100.943	107.233	4774.100	171.282
1985Q3	58.015	0.886	100.762	107.900	4865.800	171.834
1985Q4	57.706	0.886	100.657	109.000	4878.300	172.867
1986Q1	41.867	0.924	101.093	109.567	4919.600	173.710
1986Q2	27.723	0.924	101.252	109.033	4974.600	173.277
1986Q3	25.506	0.924	101.100	109.700	5064.700	173.848
1986Q4	28.716	0.924	100.663	110.467	5097.100	174.337
1987Q1	35.531	0.894	100.513	111.800	5097.900	175.575
1987Q2	38.136	0.894	100.732	113.067	5168.600	176.981
1987Q3	39.292	0.894	100.801	114.267	5228.500	178.225
1987Q4	36.728	0.894	100.179	115.333	5239.500	178.897
1988Q1	30.782	0.908	100.610	116.233	5332.700	180.070
1988Q2	31.424	0.908	100.946	117.567	5371.800	181.617
1988Q3	28.346	0.908	101.134	119.000	5417.700	183.169
1988Q4	26.004	0.908	100.961	120.300	5479.700	184.360
1989Q1	32.476	0.944	101.024	121.667	5505.000	185.767
1989Q2	36.128	0.944	100.625	123.633	5530.900	187.480
1989Q3	33.281	0.944	100.715	124.600	5585.900	188.503
1989Q4	35.241	0.944	100.710	125.867	5610.500	189.773
1990Q1	36.322	1.130	100.635	128.033	5658.700	191.886
1990Q2	29.029	1.130	100.546	129.300	5676.400	193.096
1990Q3	41.335	1.130	99.059	131.533	5699.300	194.386
1990Q4	52.280	1.130	97.585	133.767	5656.200	195.684
1991Q1	33.990	1.336	98.575	134.767	5636.700	197.313
1991Q2	31.525	1.336	99.490	135.567	5684.000	198.693
1991Q3	32.093	1.336	99.499	136.600	5711.600	199.732
1991Q4	32.141	1.336	98.362	137.733	5710.100	200.144
1992Q1	27.430	1.387	98.194	138.667	5817.300	200.971
1992Q2	31.452	1.387	99.057	139.733	5857.200	202.585
1992Q3	32.495	1.387	98.846	140.800	5920.600	203.518
1992Q4	30.299	1.387	99.640	142.033	5991.100	205.255
1993Q1	28.554	1.319	100.183	143.067	6013.800	206.633
1993Q2	28.883	1.319	99.510	144.100	6067.800	207.239
1993Q3	25.381	1.319	99.046	144.767	6134.800	207.611
1993Q4	22.737	1.319	99.784	145.967	6189.100	209.280
1994Q1	20.886	1.226	100.751	146.700	6260.100	210.627
1994Q2	25.217	1.226	100.687	147.533	6308.600	211.419

References

[1] Hamilton, James D. "Oil and the Macroeconomy since World War II." *Journal of Political Economy* 91, no. 2 (1983): 228 - 48.

[2] Hanabusa, Kunihiro. "Causality Relationship between the Price of Oil and Economic Growth in Japan." *Energy Policy* 37, no. 5 (2009): 1953-957.

[3] TovarJalles, Joao. "Do Oil Prices Matter? The Case of a Small Open Economy." *Annals of Economics and Finance* 10, no. 1 (2010): 65-87.

[4] Odusam, Babatunde Olatunji. "To Consume or Not: How Oil Prices Affect the Comovement of Consumption and Aggregate Wealth." *Energy Economics* 32, no. 4 (2010).

[5] Hamilton, James D. "Historical Oil Shocks." In *Routledge Handbook of Major Events in Economic History*, 239-65. 2013.

[6] He, Yanan, Shouyang Wang, and Kin Keung Lai. "Global Economic Activity and Crude Oil Prices: A Cointegration Analysis." *Energy Economics* 32, no. 4 (2010): 868-76.

[7] Gounder, Rumania, and Matthew Bartleet. "Oil Price Shocks and Economic Growth: Evidence for New Zealand, 1989-2006." 2007.

[8] OECD (2015), Consumer confidence index (CCI) (indicator). doi: 10.1787/46434d78-en (Accessed on 10 May 2015)

[9] "Short-Term Energy Outlook." U.S. Energy Information Administration. Accessed May 10, 2015. http://www.eia.gov/forecasts/steo/realprices/.

[10] Board of Governors of the Federal Reserve System (US), Effective Federal Funds Rate[FEDFUNDS], retrieved from FRED, Federal Reserve Bank of St. Louis https://research.stlouisfed.org/fred2/series/FEDFUNDS/, May 1, 2015.

[11] US. Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items [CPIAUCSL], retrieved from FRED, Federal Reserve Bank of St. Louis https://research.stlouisfed.org/fred2/series/CPIAUCSL/, April 25, 2015.

[12] "Historical National Population Estimates: July 1, 1900 to July 1, 1999." U.S. Census Bureau. April 11, 2000. Accessed May 10, 2015. https://www.census.gov/popest/data/national/totals/pre-1980/tables/popclockest.txt.

[13] "Petroleum." Petroleum.co.uk. Accessed May 10, 2015. http://www.petroleum.co.uk/.