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Connecticut Economic Outlook for 2013-2015: A Perspective from Sacred Heart University Students in Business Economics

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**Sacred Heart University
John F. Welch College of Business**

**CONNECTICUT ECONOMIC OUTLOOK for 2013-2015:
A Perspective from Sacred Heart University Students in Business Economics**

*Final Research Project for EC392 – Economic and Financial Forecasting
Instructor: Dr. Lucjan T. Orłowski - Professor and Chair, Department of Economics
and Finance*

Spring 2013

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Nontechnical Summary

by Ashley Moore

The state of Connecticut has been severely impacted by the recent financial crisis, perhaps more greatly than other states. It was our objective to apply the skills we have acquired as an undergraduate class in Economic Forecasting at Sacred Heart University in Fairfield, Connecticut, to compare various economic indicators and trends of the State of Connecticut to those of the United States. We ultimately wanted to evaluate the real Connecticut economy, labor market developments, public sector, housing market and financial sector to determine the direction Connecticut fiscal policy should be steered in the future. The six groups of students were allotted a particular part of the economy to further investigate through statistical and literary research. Ultimately, we used our resources and statistical software to develop the forecasts throughout this paper.

Our findings indicate that the real economy of Connecticut is improving, although at a slower rate than the overall nation. Although the State has generated the same gross domestic product (GDP) growth as the nation in 2012 at 2.5%, our baseline scenario analysis indicates GDP growth in Connecticut will dip to about 2.3% in 2013 but increase a tenth of a percent each year until it reaches 2.5% in 2015. Our estimation output shows that worst-case scenario state growth would be 1.8%, by 2015 and best-case scenario growth would be 3.2% by 2015. Despite the appeal of a 3.2% growth projection, we feel as if reforms in the state economy as well as elevated tax rates both on households and businesses relative to the majority of the nation will cause a more stagnant growth than 3.2%.

Inflation in the State, as well as the nation, has been subdued thus far. Inflation estimates calculated in this forecast are based on the Consumer Price Index (CPI). Intuitively, we are anticipating an increase in CPI during the periods 2013-2015 due to the current monetary policy of the Federal Reserve, as well as a steady increase in real aggregate demand. Our numbers indicate an increase in inflation from 2.1% in 2012 to 2.5% in 2013, 3.2% in 2014 and 3.4% in 2015. However, we feel as if by the latter part of our forecast, inflation numbers we be driven by the spending and dis-saving of both consumers and business. Additionally, banks and small businesses are likely to feel profitability tighten as inflation adjusted lending interest rates will be minuscule.

The unemployment rate is a major economic indicator in constant limelight and currently, scrutiny. Whether uttered throughout the media or the basis of a political debate, the unemployment rate since the financial crisis has soared to distasteful numbers. In 2012, the state unemployment rate of the civilian labor force was 8.0%, which

exceeded the overall US economy unemployment. This high level reflects through structural state reforms that are discussed further throughout the paper. Such a high level of unemployment is also due to high taxation in the state. Taxation on properties in most of Connecticut townships is rising at a rapid pace, as well as high taxation on business profits. Historically, the state's unemployment has followed a strikingly similar pattern post-recession. Under the assumption that this pattern will hold as the state climbs out of the recent recession, we project unemployment to drop to 7.2% by year-end 2014, and 6.8% by year-end 2015.

While Connecticut seemed to fair better during the recent financial crisis than the rest of the United States, it was not able to escape the housing bubble unscathed. The financial crisis' effects of this were noticeable across the entire housing market, as it affected housing starts, home ownership, home vacancy and housing prices. In the aftermath of the crisis, as of the beginning of 2013, single-family homes rose significantly since early 2012, deposits on condominiums rose nearly 30% - the highest level in three years, and financial institutions have begun approving more housing loans. Median home prices have stabilized after a full year of consistent growth in both the number of deposits and closings. We believe the consistent growth period that Connecticut has seen over 2012 is important as it will drive the housing market back towards equilibrium for the periods of 2013-2015. On the other hand, 2013 also had some negative indicators for the housing market. The rental market saw nearly 3% less leases, foreclosures are on the rise, and more people are leaning towards more affordable homes rather than the large luxury home market the state possesses. Because there is a clear mixture of positive and negative feedback from the first quarter of 2013, we believe a reasonable forecast would be slight growth in 2013 due to forecasted decreasing rates of unemployment, and more growth in 2014-2015 as the housing market and economy slowly reach an equilibrium.

The financial crisis has had an effect on banks at the local, state, and national level. Many banks faced solvency issues, causing an epidemic of filed bankruptcies across the banking sector. Basel Committee on Banking Supervision has issued Basel II and Basel III scenarios, which are recommendations on banking laws and regulations. These were intended to create an international standard for banking regulators to control how much capital banks need to put aside to guard against the types of financial and operational risks banks face. Currently, commercial banks are meeting Basel III standards, but not by much. There is still much more room to increase solvency within our commercial banks. Connecticut commercial banks have been more profitable for a few reasons. Firstly, since the outbreak of the recent financial crisis in Q3 2007, there has been 483 failed or government assisted banks, zero of which have taken place in Connecticut. Commercial banks are most likely to remain profitable after the Federal

Reserve announced on May 1st 2013 that they would continue their asset-purchasing program of purchasing \$85 billion of treasuries and mortgage-backed securities each month into 2014.

As many of us are students graduating entering the work force in the tri-state area, we feel recognizing the issues and taking steps to better the state economy should be top priority because it will help open doors for future students to seek employment after they complete their education in order to pay back debt and contribute to the economy. The highly service-driven economy of Connecticut faced harsh repercussions from the financial crisis, however; hopefully new laws and regulations will help to prevent a similar crash in the future. In order to fully protect itself from such an occurrence, we feel that Connecticut needs to work towards creating more of a manufacturing sector, like it once had. By focusing on the diversification of the labor market and making the State a more business-friendly environment, we hope that Connecticut's economy will return to a prosperous state.

I. Outlook for the Real Economy of Connecticut

by Anna Kadlof & Suzanne May

Forecast Summary

The current economic condition of Connecticut is improving since the recent financial crisis. When compared at the national level, Connecticut has been recovering at a slightly slower pace.

Real Gross State Product:

Based on our estimation, the State real economy, i.e. real gross domestic product, grew at the annual rate of 2.5% in 2012, which was exactly the same as the rate of growth of the US economy. Our models, which technical features are described below, imply that the State real GDP will grow at a somewhat slower pace of 2.3% in 2013. It will modestly accelerate to the growth rate of 2.4% in 2014 and 2.5% in 2015. The low-growth scenario implies the rate of growth of 1.8% by 2015, and the most optimistic scenario suggests 3.2%. However, considering the ongoing structural changes in the State economy accompanied by the high overall taxation of households and businesses relative to the overwhelming majority of US states, the high-growth scenario seems extremely unlikely.

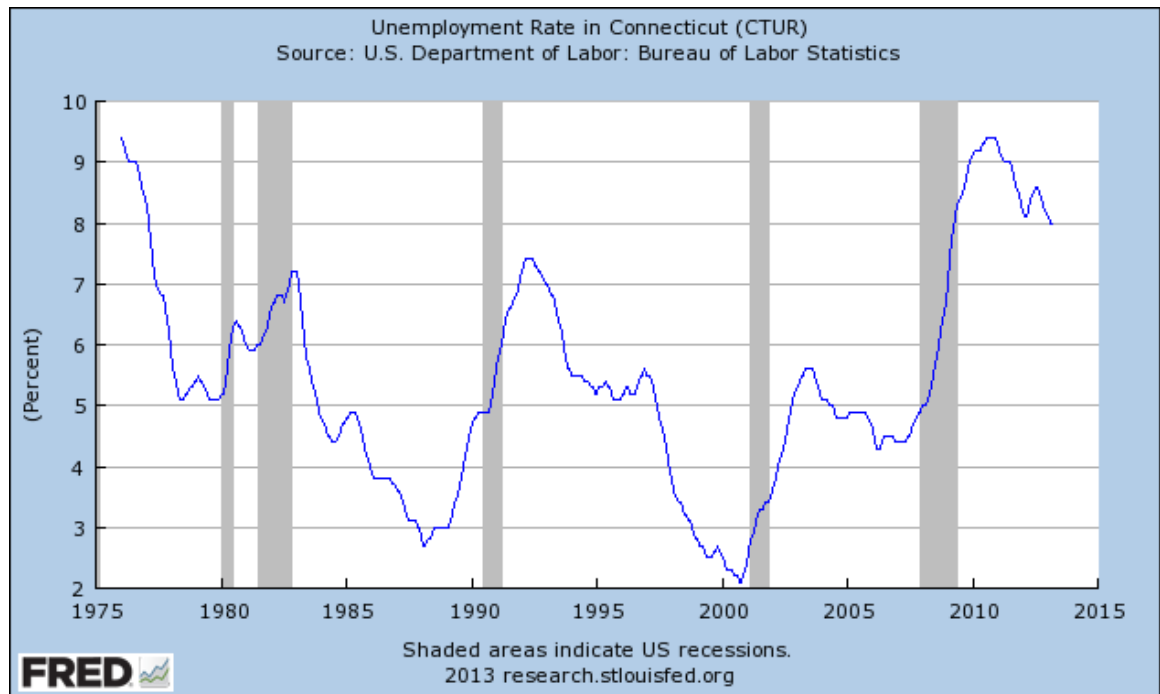
Inflation (Based on State CPI):

Just like in the national US economy, inflation in the State has been so far subdued. However, we anticipate the rate of increase in consumer price index to accelerate during the period 2013-2015. Our data show that the rate of inflation based on the year-on-year changes in the State consumer price index was 2.1 % in 2012. We expect it to increase to 2.5% in 2013, 3.2% in 2014 and 3.4% in 2015. The ongoing highly accommodative, “ultra-easy” monetary policy of the Federal Reserve, along with a modest increase in real aggregate demand should contribute to acceleration in the rate of inflation. The expected inflation for the end of our forecast period will likely stipulate dissaving by consumers and businesses. It will put a squeeze on profitability of banks and most of small businesses as real (inflation adjusted) interest rates will likely move to a decisively negative territory.

Unemployment:

The State unemployment rate of the civilian labor force was 8.0%. Its high level that exceeds the overall rate for the US economy reflects the ongoing, deep structural changes that we elaborate below. It unfortunately also reflects high overall taxation in the State, particularly high, and rising at a fast pace property taxation in the majority of Connecticut townships, as well as high taxation of business profits. The Connecticut unemployment adjustment patterns following recessionary periods display a remarkable similarity, as shown on the graph below. Assuming a similar response to the recent recession and

running the technical forecast specified below, we expect that the unemployment rate will decline to 7.2% by the end of 2014 and 6.8% by the end of 2015.



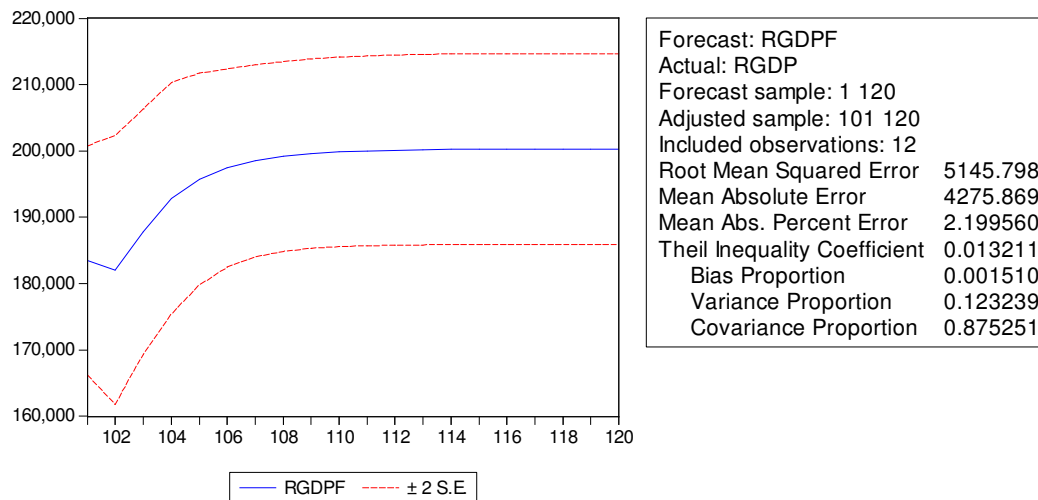
Models and Technical Explanations

After running a least square regression for the state of Connecticut real GDP, it was determined that the regression is optimized at ARMA(4,2). The ARMA(4,2) regression had an AIC of 18.52268. However, only the constant was significant in this regression. From this model we were able to forecast real GDP. It was a stable forecast because the Theil Inequality Coefficient was 0.013211, very close to the targeted value of 0. The bias 0.001510 and variance proportion 0.123239 were minimized while the covariance portion 0.875251 was maximized. Thus, this is a robust forecast, which is depicted below in graph 1. Our forecast depicts that Connecticut's economy and real GDP is to continue to rise. This slow recovery may be due to Connecticut's heavy reliance on the financial services industry for the states GDP.

Table 1:

MA\AR	0	1	2	3	4
0		20.21623	20.39676	20.31630	20.54312
1	20.77298	20.27830	20.13925	20.40457	20.52884
2	20.15656	19.85623	20.20479	20.08749	18.52268
3	20.47908	19.91713	20.41781	20.22254	20.04131
4	20.03395	19.55602	20.26706	19.511591	20.07010

Graph 1:



After examining the change in real GDP in Connecticut we were able to optimize the equation using ARMA(4,3) (Table 1). That is, the residuals for Connecticut real GDP are dependent on the last three periods, and the values are affected by the past four periods. This regression had an AIC of 19.11152, greater than the Connecticut real GDP regression, suggesting that the previous regression using real Connecticut GDP is more robust. We were unable to forecast this regression due to lack of data.

Table 2:

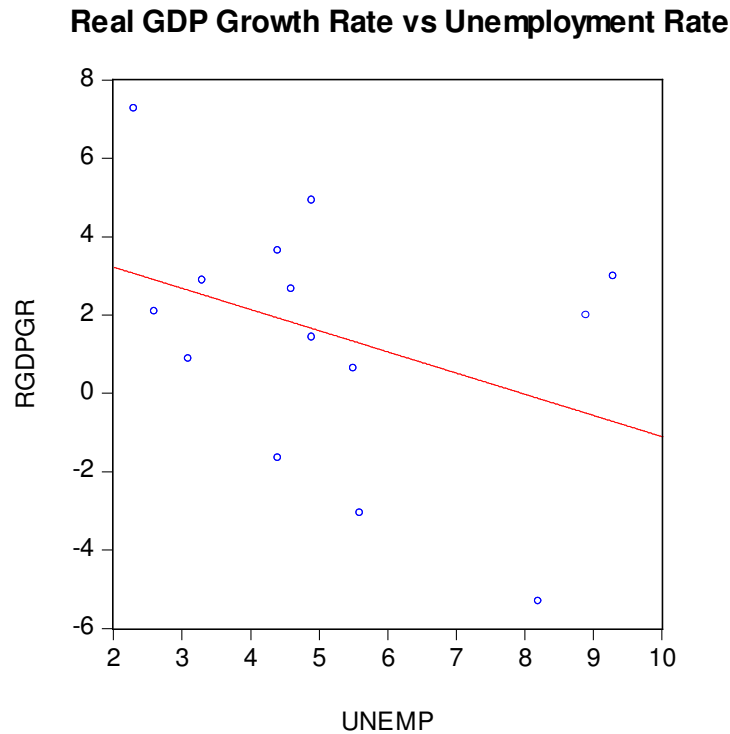
MA\AR	0	1	2	3	4
0		20.53363	20.64168	20.55539	20.86937
1	20.39684	20.43046	20.38993	20.71612	21.04154
2	20.31610	20.25574	20.42948	20.28803	21.02470
3	19.75265	19.94537	20.29519	20.36441	19.11152
4	20.42669	20.37809	20.47079	20.88234	21.15662

In addition to this regression, we also conducted a time trend analysis. In this analysis we found that the quadratic version of the regression was more ROBUST. Both the trend, and the @trend component are significant at the 1% level. The AIC for just the @trend component was 20.64586, while also including the @trend^2 the AIC was 20.09412. However, this AIC is worse than the original regression run with ARMA(4,2).

In addition to Connecticut real GDP and the change in Connecticut GDP, we also examined the rate of unemployment in both Connecticut and the United States. Below is graph 2, a scattergram of real GDP growth versus unemployment. This

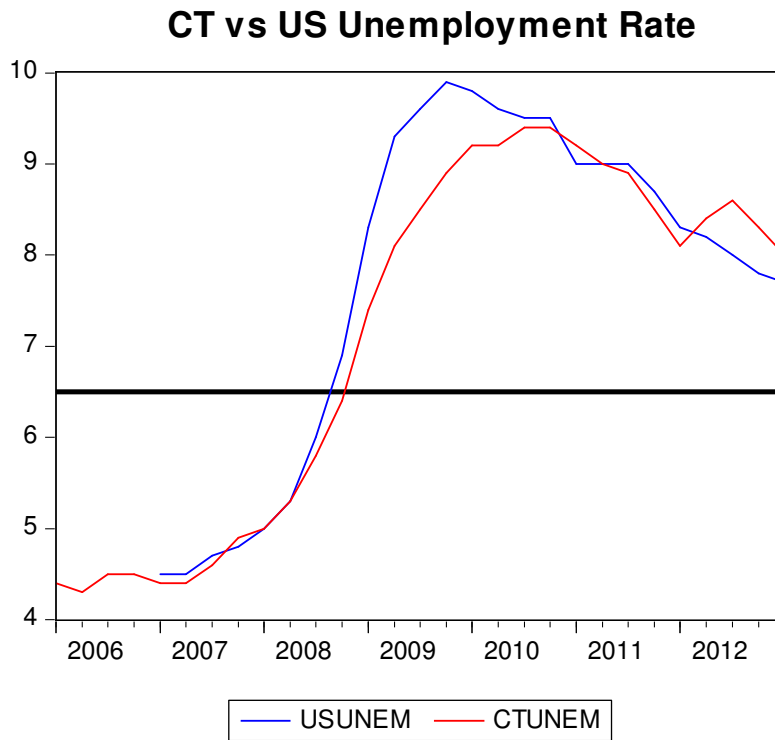
graph suggests that as unemployment grows, real GDP for Connecticut will decline as well.

Graph 2:



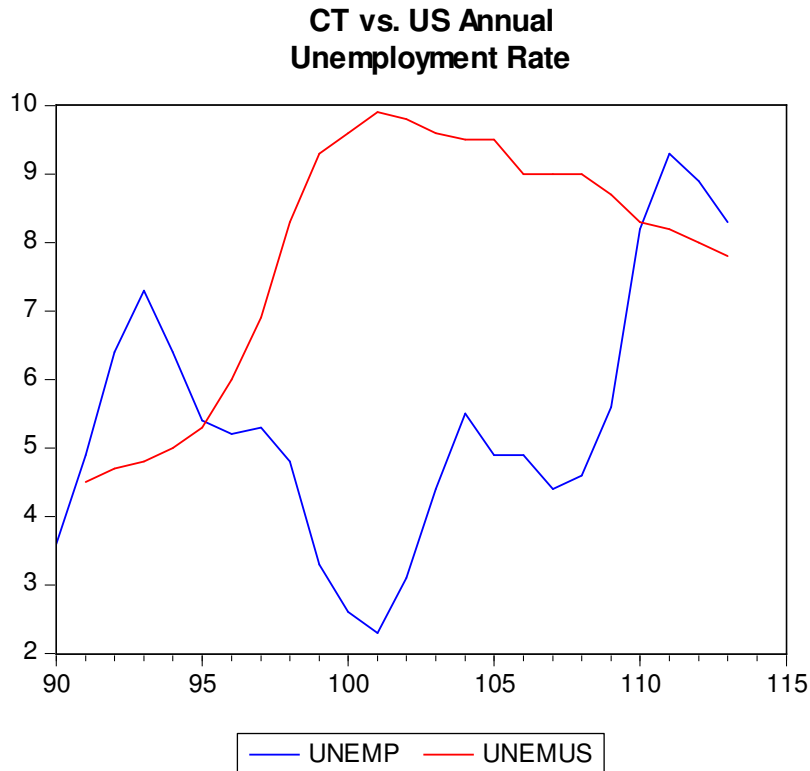
When graphing the Connecticut Unemployment rate vs. the national unemployment rate (graphs 3&4), we found that the Connecticut unemployment rate has surpassed the national level. Viewing the quarterly data, Connecticut unemployment rate was below the national rate up until the first quarter of 2011. However, by the second quarter the unemployment rates were equal, and by the third quarter Connecticut's unemployment rate again dipped below the national level. Then again in second quarter 2012, the Connecticut unemployment rate has surpassed the national unemployment rate and has been continuously. Despite these fluctuations, after viewing the graph it is evident that both Connecticut and the national rate of unemployment are following a somewhat similar trend. In this graph, it is also evident that both the Connecticut unemployment rate and the national unemployment rate are trending towards the natural rate of unemployment.

Graph 3:



In addition to quarterly data, we also examined the annual unemployment data for Connecticut and the United States. Since 1995, the Connecticut unemployment rate has been less than the national unemployment rate right up until 2010, when the annual Connecticut unemployment rate surpassed the national unemployment rate by 1.1%. This is a disappointment for Connecticut considering unemployment rate measures the relative economic performance of the state, and by this standard the local economy of Connecticut is weakening, just like the US as a whole. However, Connecticut unemployment rate seems to follow the trend of the US unemployment rate therefore we feel that Connecticut will also experience a decrease in unemployment.

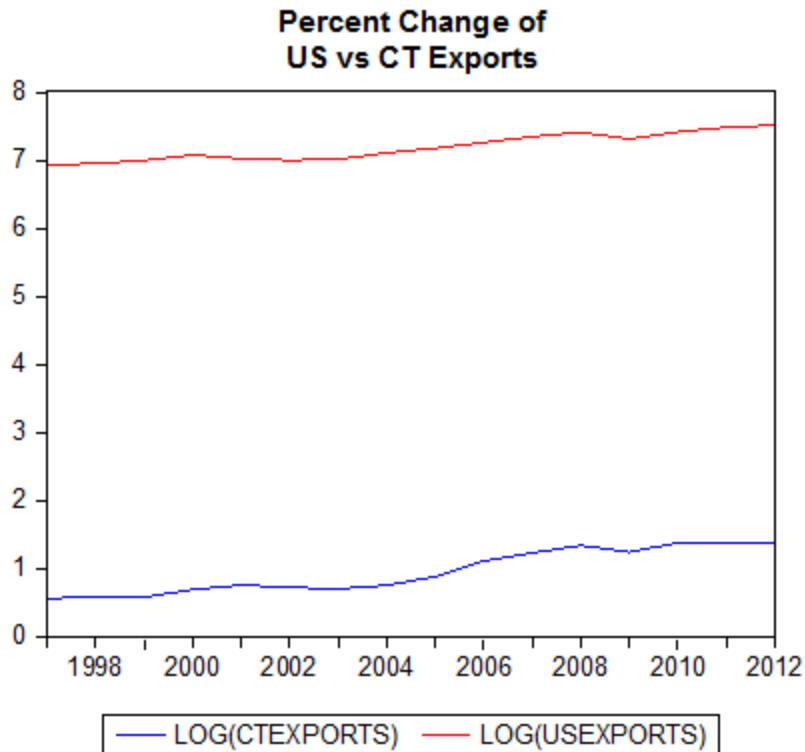
Graph 4:



When running Connecticut unemployment as a function of real GDP, we found that real GDP is significant at the 10% level. Its coefficient was significantly small, 7.27×10^{-5} . This means that a \$1,000,000 increase in real GDP, will lead to a 0.0000727% increase in unemployment, which is counterintuitive. This however is most likely caused by the small sample size, for this regression was run using annual data, for quarterly data for Connecticut real GDP was unavailable.

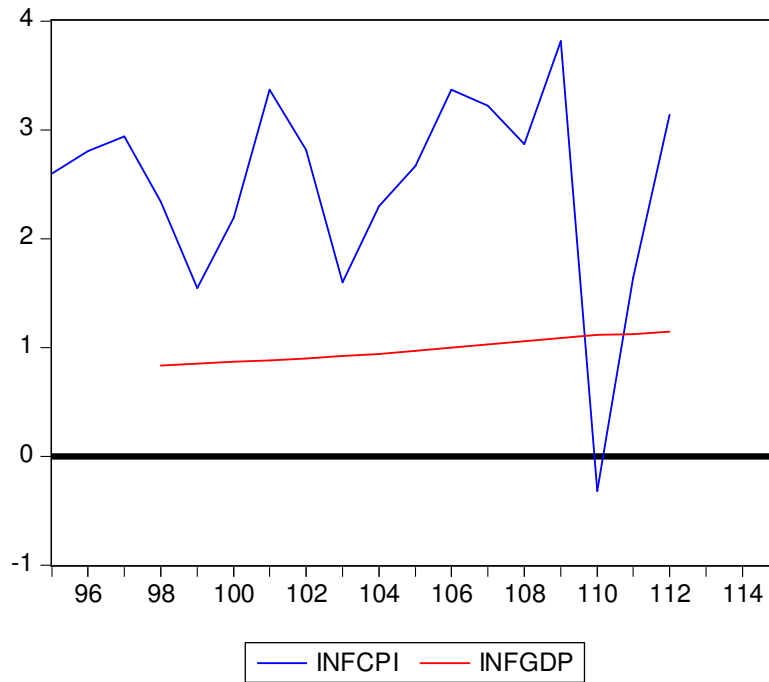
Also when examining Connecticut exports with national exports in graph 5, it is evident that Connecticut's exports follow a similar upward trend as US exports. As you can see, the slope is very shallow, representing the demise of manufacturing.

Graph 5:



In addition, we calculated inflation using two different methods. One using CPI and the other using changes in GDP, depicted below in graph 6. We found that when using the CPI method, it gave a more accurate description of the inflation in Connecticut. At the end of 2009, the US economy experienced a period of deflation. This is mirrored in the graph modeled by change in CPI, where as the inflation indicator calculated by GDP shows deflation at approximately 1% during the time period.

Graph 6:



Overall, the economic outlook for the real economy is improving. Connecticut has been on the rise in terms of GDP, reducing unemployment, and closer to the targeted inflation. Although this is positive news for Connecticut, these improvements have only been gradual, especially when compared to the US economy as a whole.

II. Structural Changes in Connecticut Economy – A Ten-Year Perspective

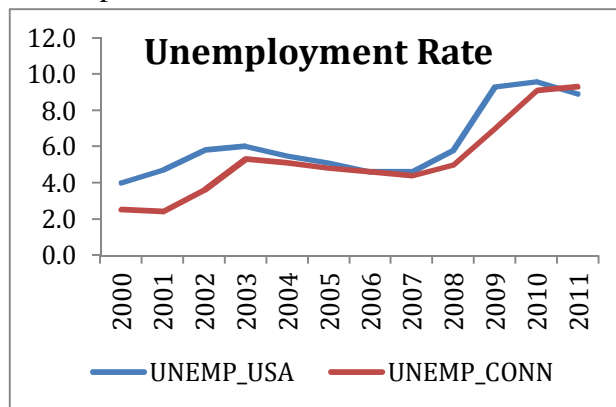
by Elisabeth Pitruzzella and Corinne Lajoie

Connecticut experienced sudden rise in unemployment in years 2002 and 2003 and again in 2009 and 2010. These unemployment fluctuations and the related discussion is the focus of our study. We looked at the unemployment trend in Connecticut and compared it to the USA level rates. Further, we also looked at the trends in the GDP growth at these two levels and tried to deduce the reasons behind the jumps in unemployment. Lastly, we used time series forecasting to analyze the unemployment rate in Connecticut and investigate whether the unemployment rate will follow upward or downward trend in coming months.

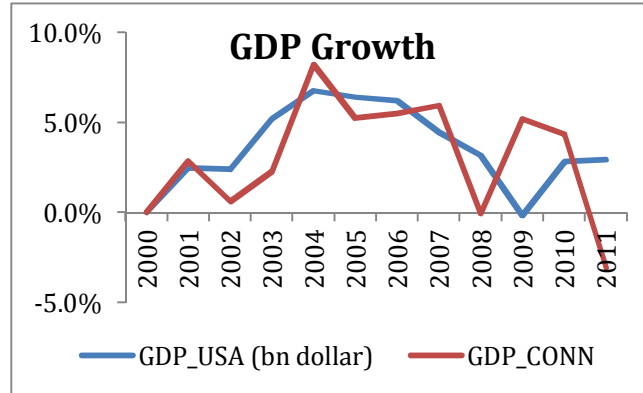
Throughout this section of the paper we will analyze the unemployment trends both nationally and statewide, discuss the data and methodology used in our analysis, and discuss our results and policy recommendations.

Recent Trends in Unemployment

The unemployment rate in Connecticut was significantly lower than the national unemployment level until 2002, which can be seen in the graph below. As we can see, the red line representing the Connecticut unemployment rate starts well below the United States unemployment level in 2000 and went beyond the national level for the first time in 2011. The rather irregular patterns in unemployment rate in Connecticut can be generally characterized by a rising unemployment phase, followed by a rather sedate or falling phase. However, since the state of Connecticut started facing rising unemployment rates in 2007, it has not since hit the downward or plateau phase that it has historically faced in the past.



We also looked at the GDP trends to see how the state and national economies have been performing in general. It is interesting to note from the graph below that while the GDP growth in Connecticut has been on the lower side of that of the national level, it was higher than the national level in 2009 and 2010 - years of deep recession.



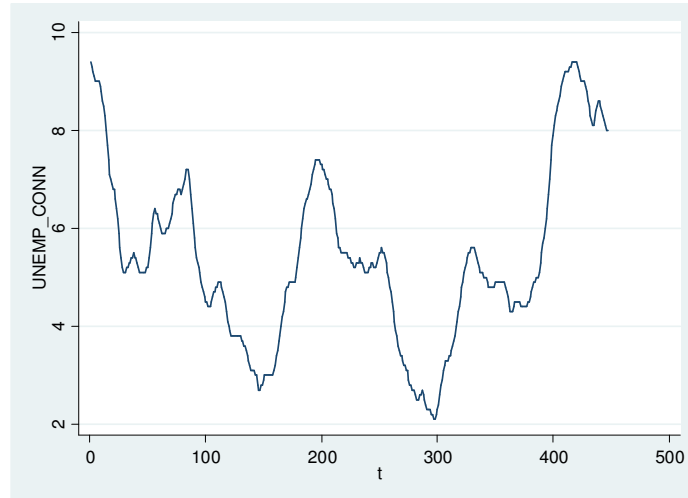
Connecticut's GDP contracted by 3% in 2011, which adversely affected employment rates during that time. The significant decrease in economic activity may be reflective of high inflation in 2011. The unemployment rate has been rising for some time now; the current state of unemployment is alarming.

In the next section, we formulate a methodology to forecast the unemployment rate in the next few months and analyze the output.

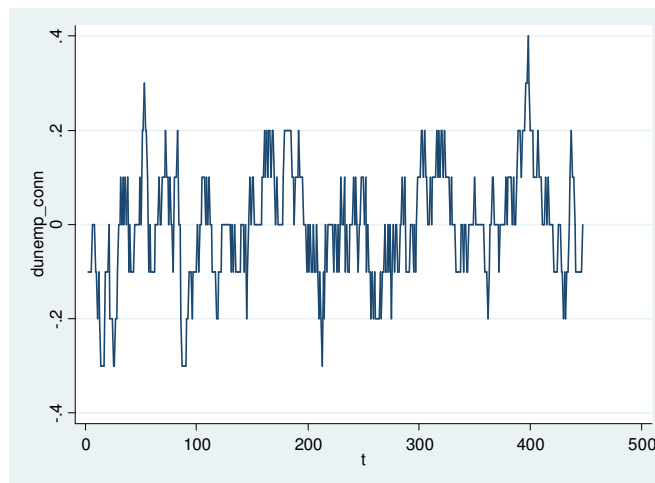
Data and Methodology

The data is sourced from Federal Reserve Economic Data - FRED - St. Louis Fed. The variable being studied is Connecticut's unemployment rate. The data series is monthly in nature and ranges from January 1976 to January 2011. Our objective is to discover the unemployment rate until June 2011 and observe the trend.

First, we plot the unemployment series to look for a trend. The graph below shows the trend in the unemployment rate over the entire data period. We see that the series is not following any particular trend. To check for the stationarity of the series, we run the Augment Dickey-Fuller test and the Philips-Perron test. However, the test statistics from both the test show that the data series is not stationary. This brings us to our next step of analysis whereby we try to make the data series stationary for further analysis.



We take the first difference of the unemployment data and plot it against time to graphically check for stationarity.



The graph above shows the graph of first difference of unemployment against time. It is evident that this data series is stationary in nature. This is confirmed by the results of Augmented Dickey-Fuller and Philips-Perron tests which reveal that the differenced series is stationary at 1% level of significance.

Now that we have a stationary series, we go on to determine the model to be used. Based on the ACF and PACF as well as the AIC and SBIC criteria, we select two lags for the autoregressive equation. Further, we use Newey-West standard errors robust regression model for estimation. This is done to avoid the serial correlation among the error terms of the model. The results are discussed in the next section.

Results and Discussion

The regression results are shown in the table below. The table shows that first lag of the differenced series is positively related to the current period. Similarly, the lag is also

positively related to the current time period value, but the level of impact is lower than that of the first lag. Both the coefficients are highly statistically significant.

dunemp_conn	Coef.	Std. Err.	t	P>t	[95% Conf. Int]	
L1.	0.4938265	0.047691	10.35	0	0.400097	0.587556
L2.	0.3549381	0.044718	7.94	0	0.267052	0.442824
_cons	-0.0002176	0.003617	-0.06	0.95	-0.00733	0.006891

In order to check for the autocorrelation among the error terms, we run the Q- White Noise test. The null hypothesis in this test is that there is no existence of white noise in the series. Therefore, a rejection of the null hypothesis shows that the series is not noise and hence there is no serial correlation. The results of our test reveal a p-value of 0, which means that we can reject the null hypothesis that the error terms are not white noise. Therefore, we can conclude that there is no serial correlation among the error terms.

Armed with a robust model, we now forecast the unemployment rate for the months after January 2011. The results are shown below.

Month	Unemployment Rate in percent terms
2011-01-01	9.40
2011-02-01	9.25
2011-03-01	9.19
2011-04-01	9.14
2011-05-01	9.10
2011-06-01	9.06

The results show that the unemployment rate will decline in the subsequent months. However, the rate of decline is very slow. The fall in the unemployment rate could be attributed to the recovery in the economy. As the national economy and economies worldwide recover the economic recession of 2008, productive activities will increase everywhere. The same will apply to Connecticut as well. However, the slow rate of fall in unemployment means that the economic activity is still not going to be enough. It is here that the government needs to intervene in the economy and provide impetus to the improving employment scenario.

Government initiatives in terms of provision for better facilitation of job search, job creation through infrastructure work and other public welfare expenses in the form of construction and manufacturing can really provide the push the economy requires. Providing subsidies to the producers and manufacturers will also help promote productive activities. These will help generate additional employment opportunity while also boost demand in the economy.

III. Labor Market Developments

by Gregory Ibe, Bradley Pierce

Motivational research is a type of marketing research that attempts to explain why consumers behave as they do or in this case what the labor market outlook is for the state of Connecticut for 2013. The data for this research project was obtained on several websites one being the Federal Reserve Bank of St. Louis. Because this for the labor market development outlook for the state of Connecticut for the year 2013 I only went back to 22 years to 1990 even going back this far I had some trouble finding some of the data.

Job Openings in the North East:

This variable will give us the percentages of job openings in the northeast. The more job openings there was in the northeast the better the labor market would be in Connecticut. I could not find job openings for the state of Connecticut alone so I went with the next best option, which was the northeast. The minimum for this was 2% and the maximum was 3.1%.

Connecticut Lending:

This stat comes down to the percentage that banks are lending in the state of Connecticut. We believe that the more lending there is the more businesses are working and creating more jobs for people. The minimum was -1.47 percent and the maximum was 1.5 percent.

Population:

Population is the amount of people that are living the in state of Connecticut. The more people are living in an area the more people will use the resources around their area , which will create revenue for local businesses and lead to more hiring of employees. The minimum was 3433 in thousands of persons and the maximum was 3591 in thousands of persons.

Unemployment Benefits:

After the recession many people were hired and laid off that lead to a spike in the amount of benefits they were receiving. This variable shows the amount of money that the State Government of Connecticut has given out yearly. We think that the more people are receiving in benefits the less the will be pressed to look for a job. The minimum for this was 486 and the maximum was 2396.

Our Analytical Model:

In this model that is composed it will show the significance that is between my dependent and independent variables.

Labor Market (employment) = Y-value

The State of Connecticut Lending (CT_lending) = b1

The percentage of job openings in the northeast (job_openings_NE) = b2

The Population of the State of Connecticut (population) = b3

The amount of unemployment benefits given out by the state of Connecticut (unemployment_benefits) = b4

Our hypothesis for our project is that the labor market is on the upward swing. Our country is slowly getting out of a recession that hit our labor market and brought the state unemployment of Connecticut to a high what hasn't been seen in decades.

Variables	Expected	Actual
Connecticut Lending	Positive	Negative
Job Openings in North East	Positive	Positive
Population	Positive	Positive
Unemployment Benefits	Negative	Negative

	CT_LENDING	JOB_OPENINGS_NE	POPULATION	UNEMPLOYMENT_BENEFITS
Mean	0.605833	2.525000	3523.731	1101.250
Median	1.110000	2.500000	3522.365	838.5000
Maximum	1.500000	3.100000	3590.347	2396.000
Minimum	-1.470000	2.000000	3432.835	486.0000
Std. Dev.	1.079069	0.304884	50.68856	693.7409
Skewness	-0.960919	0.295253	-0.257709	0.809192
Kurtosis	2.361660	2.521057	2.024332	2.062747
Jarque-Bera Probability	2.050472 0.358712	0.289042 0.865437	0.608792 0.737569	1.748807 0.417111
Sum	7.270000	30.30000	42284.77	13215.00
Sum Sq. Dev.	12.80829	1.022500	28262.63	5294040.
Observations	12	12	12	12

Dependent Variable: EMPLOYMENT
 Method: Least Squares
 Date: 05/01/13 Time: 22:31
 Sample (adjusted): 12 23
 Included observations: 12 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	701.0139	324.2457	2.161983	0.0674
CT_LENDING	-11.72504	2.979102	-3.935764	0.0056
JOB_OPENINGS_NE	34.87447	14.89634	2.341143	0.0518
POPULATION	0.260548	0.092494	2.816925	0.0259
UNEMPLOYMENT_BENEFITS	-0.039436	0.008102	-4.867445	0.0018
R-squared	0.926977	Mean dependent var		1656.642
Adjusted R-squared	0.885250	S.D. dependent var		29.62540
S.E. of regression	10.03554	Akaike info criterion		7.744480
Sum squared resid	704.9848	Schwarz criterion		7.946524
Log likelihood	-41.46688	Hannan-Quinn criter.		7.669676
F-statistic	22.21511	Durbin-Watson stat		1.781052
Prob(F-statistic)	0.000447			

Dependent Variable: EMPLOYMENT
 Method: ML - ARCH (Marquardt) - Normal distribution
 Date: 05/01/13 Time: 23:29
 Sample (adjusted): 12 23
 Included observations: 12 after adjustments
 Convergence achieved after 29 iterations
 Presample variance: backcast (parameter = 0.7)
 GARCH = C(6) + C(7)*RESID(-1)^2 + C(8)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	700.4858	290.9314	2.407735	0.0161
CT_LENDING	-12.29407	5.070168	-2.424786	0.0153
JOB_OPENINGS_NE	35.17249	11.04172	3.185417	0.0014
POPULATION	0.261625	0.084662	3.090213	0.0020
UNEMPLOYMENT_BENEFITS	-0.040481	0.008049	-5.029351	0.0000
Variance Equation				
C	42.78225	104.9168	0.407773	0.6834
RESID(-1)^2	-0.891226	2.702397	-0.329791	0.7416
GARCH(-1)	1.213832	1.904239	0.637437	0.5238
R-squared	0.918062	Mean dependent var		1656.642
Adjusted R-squared	0.871240	S.D. dependent var		29.62540
S.E. of regression	10.63053	Akaike info criterion		8.029059
Sum squared resid	791.0572	Schwarz criterion		8.352330
Log likelihood	-40.17435	Hannan-Quinn criter.		7.909372
Durbin-Watson stat	1.672751			

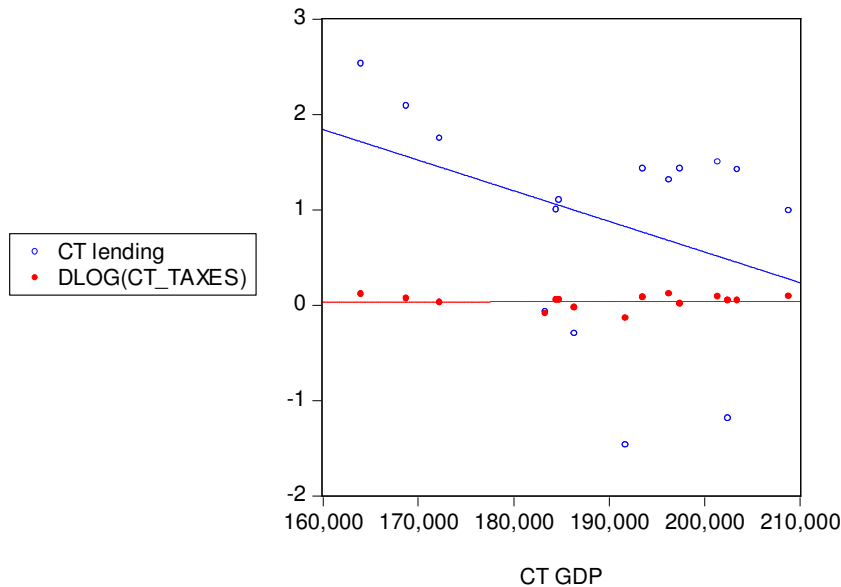
Pairwise Granger Causality Tests

Date: 05/01/13 Time: 23:36
 Sample: 1 23
 Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
JOB_OPENINGS_NE does not Granger Cause CT_LENDING	10	0.56981	0.5985
CT_LENDING does not Granger Cause JOB_OPENINGS_NE		0.58179	0.5927
POPULATION does not Granger Cause CT_LENDING	21	3.21186	0.0672
CT_LENDING does not Granger Cause POPULATION		0.56241	0.5807
UNEMPLOYMENT_BENEFITS does not Granger Cause CT_LENDING	21	0.36609	0.6991
CT_LENDING does not Granger Cause UNEMPLOYMENT_BENEFITS		16.4341	0.0001
POPULATION does not Granger Cause JOB_OPENINGS_NE	10	5.21066	0.0599
JOB_OPENINGS_NE does not Granger Cause POPULATION		3.04275	0.1366
UNEMPLOYMENT_BENEFITS does not Granger Cause JOB_OPENINGS_NE	10	0.55177	0.6074
JOB_OPENINGS_NE does not Granger Cause UNEMPLOYMENT_BENEFITS		0.19126	0.8317
UNEMPLOYMENT_BENEFITS does not Granger Cause POPULATION	21	0.34586	0.7128
POPULATION does not Granger Cause UNEMPLOYMENT_BENEFITS		2.28000	0.1345

Scatter Plot

The Graph shows a decreasing trend in the lending as the GDP grows and a very stable taxes in Connecticut. The decline in Lending in Ct can't be a good sign for the development of jobs because in order to increase in size, companies need to borrow funds and being that the taxes have been stable in terms of its percentage change from year to year, the lending shouldn't show such a drastic downward trend with the increase of GDP as stated in earlier OLS regression.



Unit Root test

Null Hypothesis: EMPLOYMENT has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic based on SIC, MAXLAG=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.633649	0.1023
Test critical values:		
1% level	-3.788030	
5% level	-3.012363	
10% level	-2.646119	

*MacKinnon (1996) one-sided p-values.

Employment- It isn't significant at a 5% level with the ADF test, but becomes significant when differenced by 1.

Null Hypothesis: JOB_OPENINGS_NE has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic based on SIC, MAXLAG=2)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.428241	0.1583
Test critical values:		
1% level	-4.297073	
5% level	-3.212696	
10% level	-2.747676	

Job Opening in Northeast was insignificant at level and barely became significant at a 5% level when differenced.

Null Hypothesis: POPULATION has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic based on SIC, MAXLAG=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	0.063562	0.9550
Test critical values:		
1% level	-3.769597	
5% level	-3.004861	
10% level	-2.642242	

*MacKinnon (1996) one-sided p-values.

Population as expected was very insignificant at level which accepts the Null but surprisingly when differenced became significant at the 5% level.

Null Hypothesis: UNEMPLOYMENT_BENEFITS has a unit root

Exogenous: Constant

Lag Length: 1 (Automatic based on SIC, MAXLAG=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.379202	0.1590
Test critical values:		
1% level	-3.788030	
5% level	-3.012363	
10% level	-2.646119	

Unemployment Benefits also proves to be the same as the 3 listed above.

RECALIBRATED OLS MODEL. (differenced)

Dependent Variable: D(EMPLOYMENT)
Method: Least Squares
Date: 05/02/13 Time: 00:42
Sample (adjusted): 13 23
Included observations: 11 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	9.789584	14.81692	0.660703	0.5333
CT_LENDING	-5.462785	10.56736	-0.516949	0.6237
D(JOB_OPENINGS_NE)	12.36907	34.53246	0.358187	0.7325
D(POPULATION)	-0.294558	1.104290	-0.266740	0.7986
D(UNEMPLOYMENT_BENEFITS)	-0.053477	0.018010	-2.969370	0.0250
R-squared	0.805832	Mean dependent var		-3.845455
Adjusted R-squared	0.676387	S.D. dependent var		27.39016
S.E. of regression	15.58144	Akaike info criterion		8.632993
Sum squared resid	1456.688	Schwarz criterion		8.813855
Log likelihood	-42.48146	Hannan-Quinn criter.		8.518986
F-statistic	6.225271	Durbin-Watson stat		1.028312
Prob(F-statistic)	0.025017			

The Optimized stationary model even though has decent robustness in the Adjusted R-squared, it shows every coefficient to be insignificant possibly signaling some serial correlation.

The addition of ARMA to help create a better forecast is needed as the chart details the ARMA (1,1) model due to the small sample size of our observation.

ARMA	AR(0)	AR(1)
MA(0)	8.632993	8.688251
MA(1)	7.895812	7.7704323

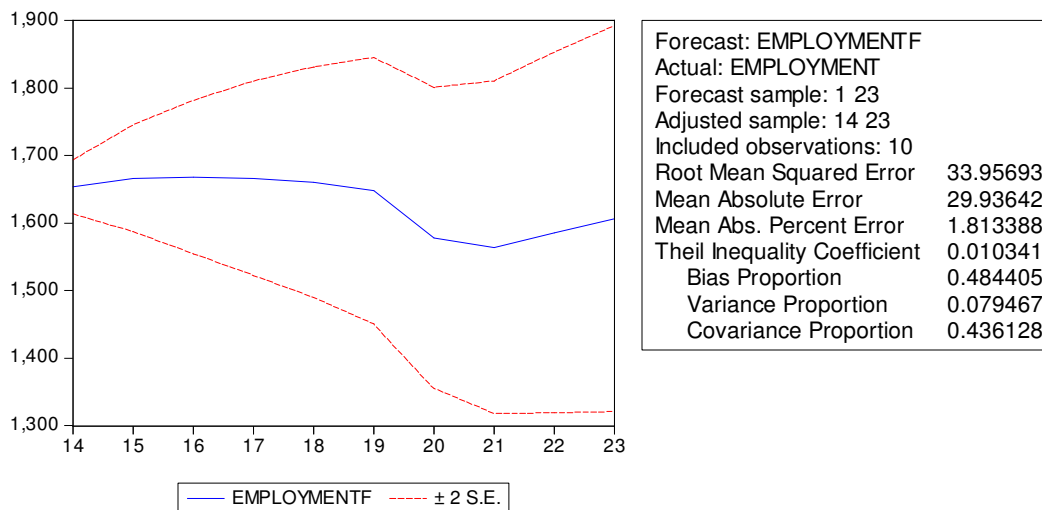
After running the model, ARMA(1,1) produced the lowest AIC and also had the highest log-likelihood making it a staple in or regression but, we still are presented with a rather insufficient model as the coefficients all still remain insignificant.

Dependent Variable: D(EMPLOYMENT)

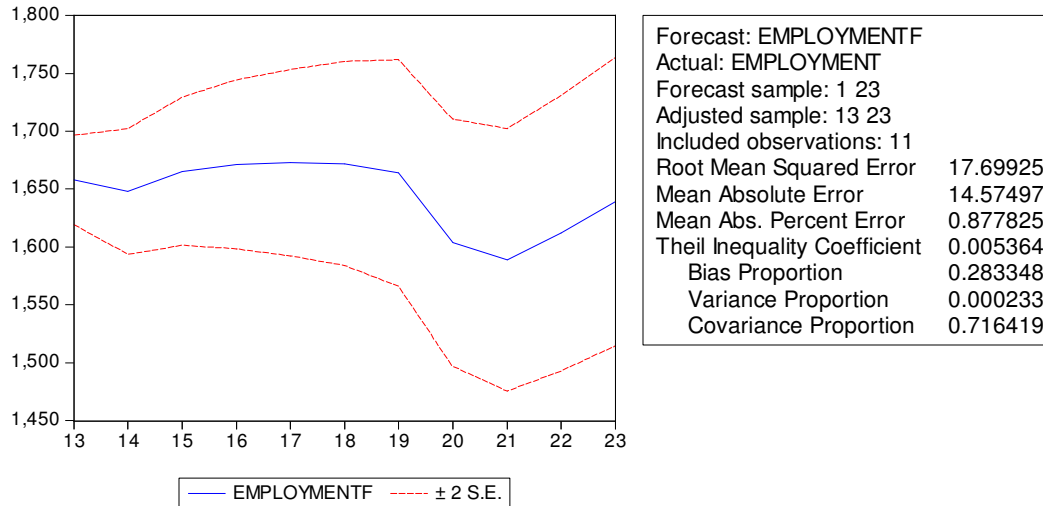
Method: Least Squares
Date: 05/02/13 Time: 00:57
Sample (adjusted): 14 23
Included observations: 10 after adjustments
Failure to improve SSR after 24 iterations
MA Backcast: 13

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.489547	16.85900	-0.266300	0.8073
CT_LENDING	-3.027181	7.739927	-0.391112	0.7218
D(JOB_OPENINGS_NE)	15.34361	12.45254	1.232167	0.3057
D(POPULATION)	0.503949	1.303146	0.386717	0.7248
D(UNEMPLOYMENT_BENEFITS)	-0.055986	0.011103	-5.042303	0.0150
AR(1)	0.517737	0.656230	0.788957	0.4877
MA(1)	0.997033	0.622011	1.602918	0.2073
R-squared	0.953337	Mean dependent var	-2.600000	
Adjusted R-squared	0.860011	S.D. dependent var	28.54155	
S.E. of regression	10.67884	Akaike info criterion	7.770432	
Sum squared resid	342.1128	Schwarz criterion	7.982242	
Log likelihood	-31.85216	Hannan-Quinn criter.	7.538078	
F-statistic	10.21515	Durbin-Watson stat	1.380456	
Prob(F-statistic)	0.041671			

Forecasted model with ARMA (1,1)- Examining this shows the regular model to be the slightly better forecast because of the lower bias proportion, variance proportion and covariance proportion. The forecasts both show high volatility in its trends as it could either down the workforce by 300000 workers or gain the same.



REGULAR MODEL



CONCLUSION-

Our concluding formula would be:

$$D(\text{employment}) = 9.78958C - 5.4627\text{LENDING} + 12.369 D(\text{JOB Op}) - 0.294D(\text{population}) - 0.0534D(\text{UNEMPBEN})$$

The data was hard to acquire to implement a significant forecast especially being that some of the coefficients weren't recorded therefore making it hard for our coefficients to be significant. However, most of our hypothesis in the end the mindset in which we had in mind stuck through with the exception of lending. The CT state department seems to think that the annual employment growth from 2010 until 2020 will be 1876 jobs. In order for that to happen, the lending as a result of high GDP output by the state has to keep on its trend of reducing. The less we lend in CT the more companies have at their disposal to employ someone instead of pay the bills. The Unemployment rate of course with its inverse relationship to employment has to continue to reduce. The population is a tricky one because the availability of people usually means more competition and more people employed, but also means that more people go unemployed, therefore leaving a quandary for the labor markets. Finally job opportunities have to grow, which goes alongside the lending, because when companies don't have debt to pay, they are willing to employ additional staff in order to expand rather than contract. The graph of employment had been showing a drastic downward trend, but due to the recent economic surge CT was able to bounce back from the horrendous recessionary periods only to see high levels of increase in the labor force.

IV. State Budget Revenue Outlook

by Salvatore Cerami, John Chiarelli, Frank Howard

Dependent Variable: REV
 Method: Least Squares
 Date: 05/01/13 Time: 21:00
 Sample: 1 15
 Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	22.21309	3.096298	7.174079	0.0000
LGUMP	-3.014251	1.091169	-2.762406	0.0200
WAGE	-0.000968	0.000267	-3.621774	0.0047
GDP	0.000224	0.000101	2.223316	0.0504
PCPI	0.000795	0.000341	2.335491	0.0417
R-squared	0.585867	Mean dependent var	13.41133	
Adjusted R-squared	0.420214	S.D. dependent var	1.093460	
S.E. of regression	0.832601	Akaike info criterion	2.732677	
Sum squared resid	6.932242	Schwarz criterion	2.968693	
Log likelihood	-15.49508	Hannan-Quinn criter.	2.730163	
F-statistic	3.536710	Durbin-Watson stat	2.596428	
Prob(F-statistic)	0.047865			

Dependent Variable: REV
 Method: ML - ARCH (Marquardt) - Normal distribution
 Date: 05/01/13 Time: 21:35
 Sample: 1 15
 Included observations: 15
 Convergence achieved after 23 iterations
 Presample variance: backcast (parameter = 0.7)
 GARCH = C(6) + C(7)*RESID(-1)^2 + C(8)*GARCH(-1)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	21.97813	3.112013	7.062352	0.0000
LGUMP	-2.830454	0.960466	-2.946959	0.0032
WAGE	-0.000875	0.000213	-4.101757	0.0000
GDP	0.000235	0.000159	1.480451	0.1388
PCPI	0.000581	0.000573	1.014041	0.3106

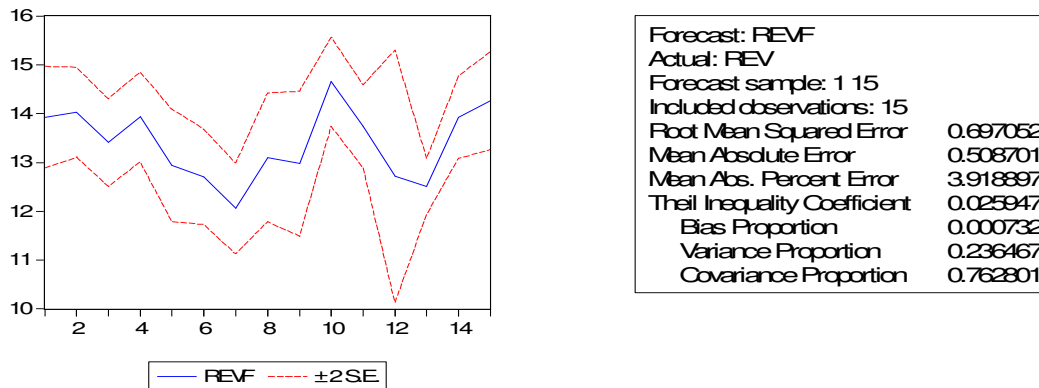
Variance Equation

C	-0.035609	0.113077	-0.314912	0.7528
RESID(-1)^2	-0.210462	1.025573	-0.205214	0.8374
GARCH(-1)	1.520009	1.348913	1.126840	0.2598
R-squared	0.564600	Mean dependent var	13.41133	
Adjusted R-squared	0.390441	S.D. dependent var	1.093460	
S.E. of regression	0.853711	Akaike info criterion	2.628049	
Sum squared resid	7.288229	Schwarz criterion	3.005676	
Log likelihood	-11.71037	Hannan-Quinn criter.	2.624027	
F-statistic	1.852487	Durbin-Watson stat	2.617454	
Prob(F-statistic)	0.181604			

The regressions that we ran provided some results that help us in understanding the effects of the independent variables on state revenue. We ran a regression using the least squares method, this provides some accurate results because it eliminates the effect of missing variables or an incomplete sample. When analyzing the regression we noticed a couple of things that give us very good insights on this model. Both unemployment and wage had an indirect correlation with the state revenue. As the unemployment increased by 1%, the state revenue decreased by 2.38%. This is to be expected because unemployment has always been a big indicator of the how a country or state or performing financially. When running the T-test we could see that this variable is significant in the 95% level. When analyzing the wage variable we can see the indirect correlation of this and the state revenue. The impact of it was not as big as the one with unemployment because it had a very small coefficient of -0.00096. However this has the bias that we expected and it also was significant at the 99% level. Even thou it has a very small coefficient it should not be ignored because when running sensitivity tests its impact in the model were noticeable. The next two variables had a positive correlation with state revenue. This all had the bias that we predicted because as GDP and PCPI go up the state revenue is expected to go up. Like expected these variables also had small coefficients, because there are many other variables in the model that are not being measured in this study. What is important to point out is that we got the bias that we expected, both of them were significant at a 95% level, and we can get an estimate to see how it affects state revenue. We got an R² of .58 which means our model does indeed represent a good portion of what happens in reality. We had hope to get a little higher than this but it is to be expected when running a regression that has so many variables.

The next regression we ran was using the ML - ARCH model. This is very useful when running a model were the data constantly change. We decided that it would be good for us to run the model because it would take care of some uncertainties created by our original one. When we analyze it we can see that that we got very similar results than the regressions previously discussed. The bias for both unemployment and wages was what we expected, both of them had a negative correlation once again with unemployment having a very big coefficient of 2.83%. When looking at the z scores we could see that

both of them were highly significant with extremely good provability scores. The next two variables GDP and PCPI both gave us the expected result having a direct correlation with state revenue. Similarly to the least square model they both had small coefficients, however we could see that the variable were not as significant as we had hoped they were a little bit over the 10% level. These are not bad scores and we decided that the impacts of our variables do need to be considered when running the model. The R^2 was .57; which is to be expected and it shows that the model we ran is accurate, but could use a few other variables.



This next graph we found to be extremely useful and surprisingly accurate. Here we forecast our Revenue as a percentage of state GDP within 2 standard deviations of forecast. What we find most interesting about this graph is the year in which our data takes a significant dip. Ten years into our graph our government revenue sharply starts to tumble downward. It comes to no surprise that these were the start of the recessionary years for the United States of America and the state of Connecticut also felt its impact. There are a few reasons for this downward spiral. First off we can blame the unemployment rate. As our data shows, the unemployment rate for the state was at 4.6 in the year 2007. At the 10 value on the horizontal axis of our graph you see that our REV number is at highest. What also should be noted is our other variables were also at their highest during this time period. Per capita personal income(55,859) and GDP for the state of CT (221,133,000) were at their climax. During the next 3 years unemployment jumped from 4.6 to 9.3 in 2010. This was the highest unemployment has ever been in the state and is showed by the minimum point in our graph at the 13 year mark. The Department of Labor showed there were 119,000 publically lost jobs in the state, with an additional 16,000 state jobs lost. At its low point, which came in the fourth quarter of 2009, was supposed to be a GDP of \$204.5 billion. But new data show the state's rock bottom of economic output was actually about 7 percent lower, coming in just above \$190 billion. Our numbers that you see in the chart to the right show a Theil Inequality Coefficient of 0.0259. As a rule, the closer this number is to zero, the more accurate a projection is. We are pleased with this number and believe that our graph not only shows a correlation to Connecticut's economic health but the nations as well. As you may have noticed the REV number is creeping back upward and today it is back to the 1997 level. As for the future we remain unsure about the future of the CT state revenue for many reasons however one statistic is holds our hopes at rest. The job market in CT is not growing. Over the past 2

decades the job market has only grown 1.8%, and today there are fewer jobs in CT than there were in 1988. In order to boost our revenue number we would have to entice the citizens to spend or raise taxes. With little to no job creation in the coming 18 months, according to Governor Dannel Malloy, "The new understanding of the depths from which we are recovering re-enforces ... the absolute necessity for Connecticut to pursue aggressive policies and sustained investments to accelerate recovery and job creation" says Malloy. For this we believe our graph to be accurate and expect a leveling off of growth for the State revenue budget for Connecticut.

Null Hypothesis: REV has a unit root

Exogenous: Constant

Lag Length: 3 (Automatic based on SIC, MAXLAG=3)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.953914	0.0147
Test critical values: 1% level	-4.200056	
5% level	-3.175352	
10% level	-2.728985	

*MacKinnon (1996) one-sided p-values.

Warning: Probabilities and critical values calculated for 20 observations

In order to find out whether or not our data was stationary or non-stationary we had to perform a unit root test on our dependent variable REV (state revenue as a percentage of Connecticut's GDP). It is important to know this because it depends on what kind of testing we can perform on our variables. When data is stationary we can use OLS (ordinary least squared) testing. When data is non-stationary we would need to transform the data by differencing. To find out what type of data we have we chose to do an Augmented Dickey-Fuller test (ADF). According to our results we would reject the null hypothesis at the 5% and 10% levels. We can say this for sure because our t-statistical calculated values at these levels (-3.175 and -2.7289) are bigger larger than the t-critical value of -3.953. Our conclusion that our REV variable is stationary is further verified by our p-value of .0147. This number signifies that our data is stationary at the 5% level.

In terms of the current state budget outlook in Connecticut, two very crucial areas of focus are noted as "rising revenues and shrinking expenditures." Furthermore, in terms of monitoring this outlook, another focal area will be noted on April 15th when the states reviews tax filings, while will represent the position of the economy statewide.

Another note on this outlook comes from the level of spending statewide during this fiscal year. “Lembo noted that spending growth has been minimal for most of the current fiscal year, and that effort is helping to diminish the red ink”.

Furthermore, sales tax, income tax, and other tax receipts should not drop below expectations for the sake of improving Connecticut’s budget outlook. Another proposal for the sake of improving this current condition will come as a result of spending cuts. “Primarily to social services, new tax revenues from businesses, power plants, and spending” .

Another reliable good source of information relative to this project came from Tom Foley. His input here will support the presence of our GDP variable. Foley states that he “expected 40% of the problem – about 1.5 Billion – to be solved economic growth alone. Income sales and other taxes would raise more because additional people would be working, getting raises, and spending more”.

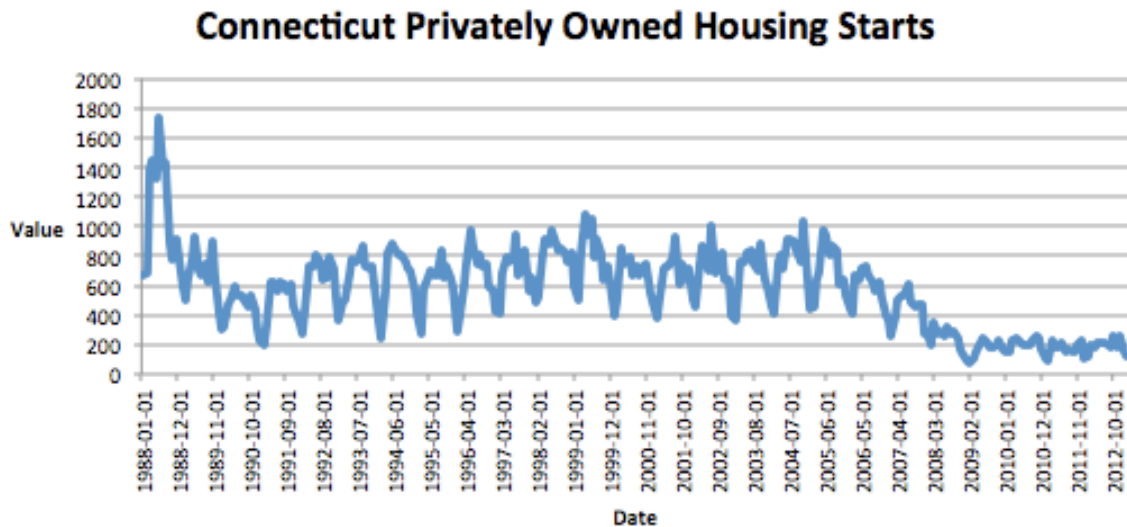
V. The Housing Market: Expecting a Rebound?

by James D'Elia, Dominick Livia

Technical Analysis of the Connecticut Housing Market

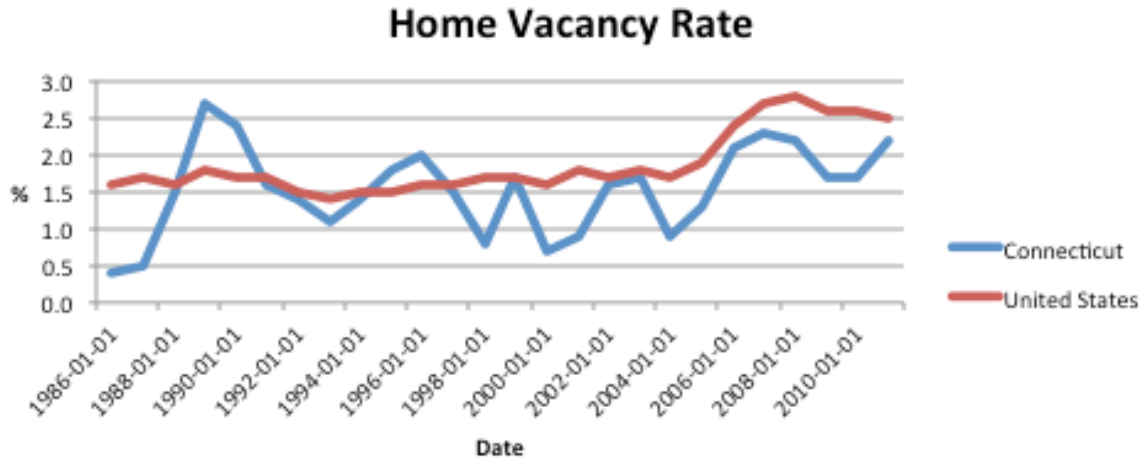
Internal Analysis of Connecticut Housing Market

Historically speaking, the Connecticut housing market has flourished in relation to the United States housing market. However, in recent years the housing market has taken a serious hit, primarily in thanks to the housing bubble of 2008, which ultimately lead to an economic recession. The effects of this recession were noticeable across the entire housing market, as it affected housing starts, home ownership, home vacancy and housing prices. While Connecticut seemed to fair better than the rest of the United States, due to its wealth as a state (consistently ranked in the top 5 in median household income), it was not able to escape the housing bubble unscathed.

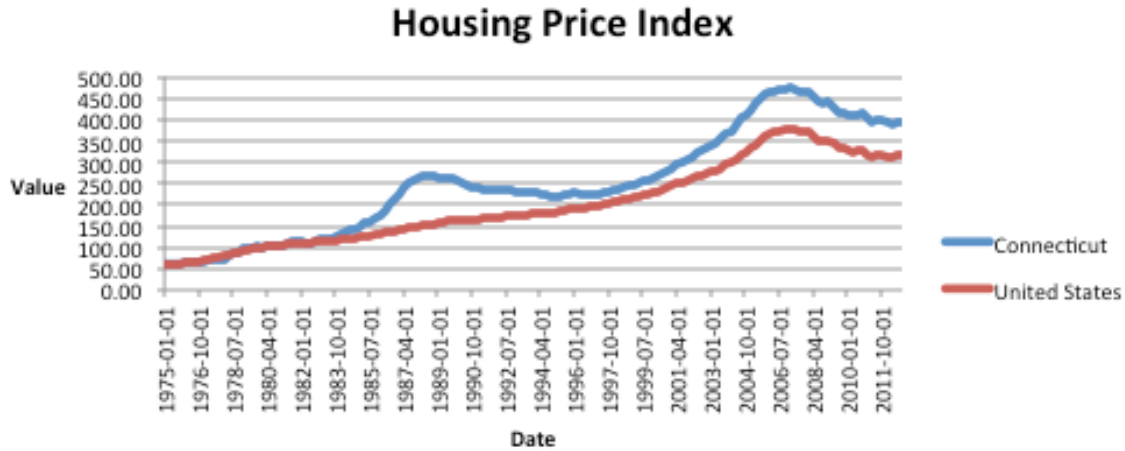


One area where Connecticut has seen a visible decline is the area of privately owned housing starts. Since the year 2007, Connecticut has seen a 56% decrease in privately owned housing starts (annually). Even more alarming is that there was a visible decline even before the housing crisis, as from 2002 through 2007 there was a 38% decrease in new housing starts. It is clear that Connecticut housing starts were already on a declining path, and that this housing bubble seemed to accelerate this downward movement. Additionally, the Connecticut privately owned housing starts market appears to have positive correlation with the United States privately owned housing starts market. Since 2006, every year the United States market appreciated, so did the Connecticut market, and every year that the United States market depreciated, so did the Connecticut. This is significant, because if the United

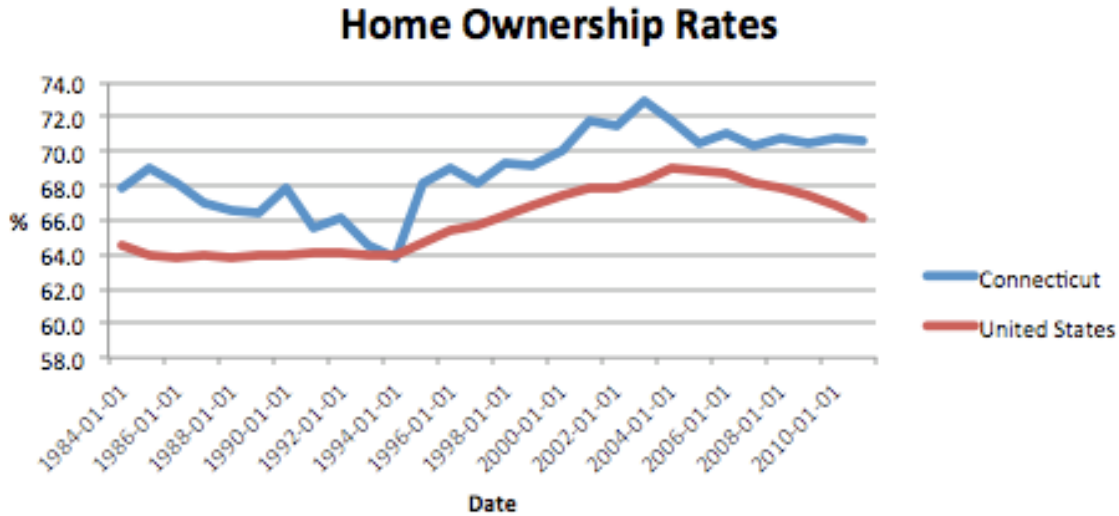
States housing market as a whole does not rebound, than one cannot expect Connecticut's market to have a significant rebound either.



Recently, Connecticut has experienced unfamiliar growth in the home vacancy rate. The average home vacancy rate from 1986 through 2004 in Connecticut was 1.4, and for the United States it was 1.6. In 2005, the home vacancy rate for Connecticut was 1.3%, and the United States home vacancy rate was 1.9%. However, since 2005 it has risen to 2.2% in Connecticut (peaking at 2.3% since the housing bubble) and 2.5% Nationally (peaking at 2.8% during the housing bubble). These may seem insignificant, but they are appreciations of 69% in Connecticut and 32% in the United States. If the home vacancy rates continue to appreciate at this level, it will not bode well for the Connecticut housing market, as well as the United States housing market as a whole. More vacant homes will create a market surplus, and drive down housing prices even further, something that the market can ill afford to experience. However, the depreciation in home prices should help return the home vacancy rates to equilibrium, as the availability of affordable homes will allow higher occupancy.



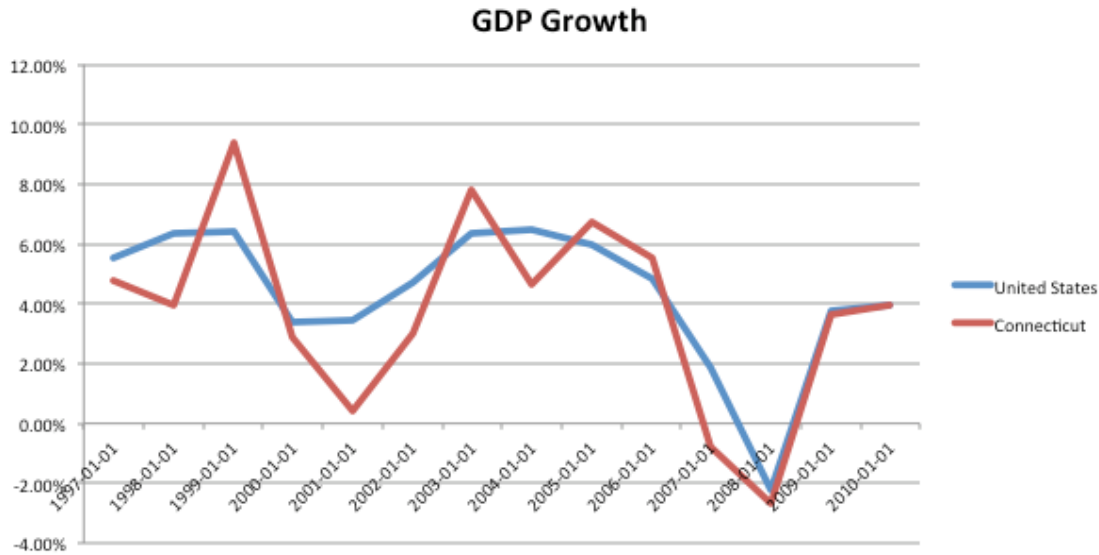
Perhaps the most significant issues Connecticut has faced are within the House Price Index. Historically, Connecticut has ranked in the upper echelon of states in terms of housing prices. Over the last 37 years, Connecticut homes have been priced 23% above the national average, peaking at 78% in the late 1980's. From 1975 through 2007, Connecticut averaged a 7% annual inflation in housing prices, and only experienced 7 years of deflation in the housing price index. Additionally, these 7 years of deflation maintained low levels, often around 1-2%. However, since 2007, Connecticut has experienced deflation in housing prices during every single year, averaging -4% annually. This has seen the housing price index drop from 469.10 to 392.21 (a 16.4% decline). Connecticut is not alone in this dilemma, as the national housing price index has also seen significant deflation. In 2007, the national housing price index maintained a level of 375.73. Since 2007, this number has depreciated to 314.22, a decline of 16.3%. This is primarily due to the housing bubble and recent economic recession. However, this is extremely significant, because it shows that while Connecticut housing prices have historically experienced superior inflation relative to the national housing price index, during times of economic hardship Connecticut is susceptible to the same deflation as the rest of the nation. This does not bode well for Connecticut, as the national housing market has yet to show signs of a rebound any time soon.



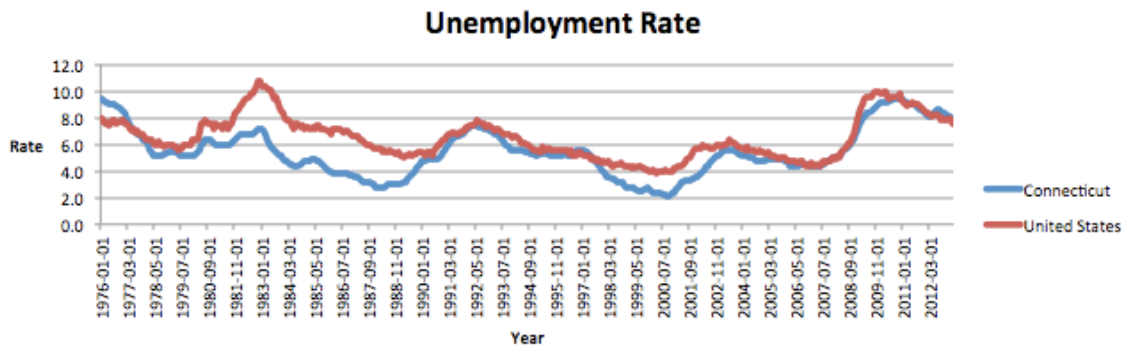
The final section analyzed within the technical analysis is the Connecticut home ownership rate. Since 1984, Connecticut has maintained an average home ownership rate of 68.9%. In comparison, the United States home ownership rate during the same time span is 66.0%, further solidifying Connecticut's superiority in the housing market. Surprisingly, Connecticut's Home Ownership rates have seen little depreciation due to the recent housing bubble. In 2007, the Connecticut home ownership rate was 70.3%. Since then, Connecticut has actually seen an appreciation in the home ownership rate, reaching 70.6% in 2011. This could be attribute to housing prices falling, making it easier and more affordable for people to live in Connecticut. However, the national home ownership rates did not share the same success. In 2007 the national home ownership rate reached 68.1%, above the historical average. However, since 2007 it has depreciated every year and is now at 66.1%.

External Analysis of the Connecticut Housing Market

While there are several internal factors that drive the Connecticut housing market, there are other external factors that also play a huge role in the efficiency of the market. These factors include Gross Domestic Product, Unemployment Rates, United States Mortgage Rates, and Per Capita Disposable Income. Historically, when these elements are in cohesion, the United States Housing Market has thrived, as well as Connecticut's. However, recently several of these factors have been thrown out of equilibrium, primarily due to the housing crisis of 2008.

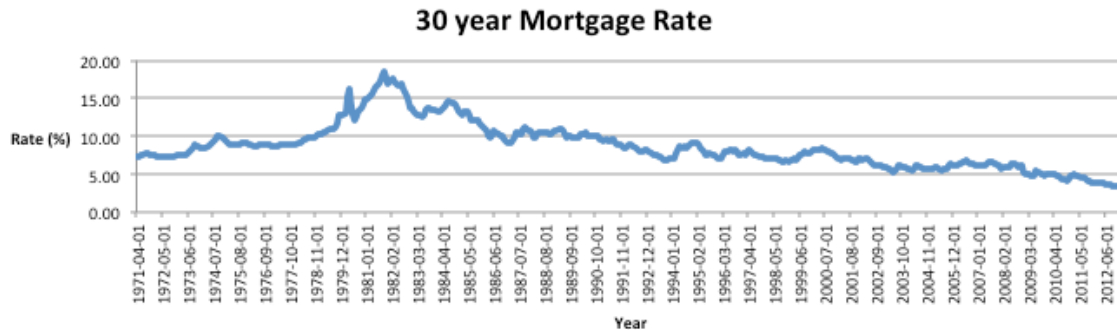


One factor that is essential to not only the housing market, but the entire economy of the United States & Connecticut is the Gross Domestic Product. Gross Domestic Product can be defined as the output of goods and services produced by labor and property located in the United States. Perhaps the most significant measure of Gross Domestic Product is the GDP Growth rate on an annual basis, as it represents the level at which a company is improving its Gross Domestic Product and expanding itself economically. Historically speaking, both the United States and Connecticut has enjoyed high levels of GDP Growth. From 1997 through 2007, the United States has sustained average GDP growth of 5.35% (Seasonally Adjusted), and Connecticut has sustained an average GDP growth of 4.92% (Seasonally Adjusted). However, since the crisis of 2008, that level has plummeted to 1.85% for the United States and 1.04% for Connecticut. Additionally, there is little optimism that the United States will ever get back to the high 5.35% levels that it maintained in the past, meaning that the housing market may never experience a significant rebound to where it was 10 years ago.

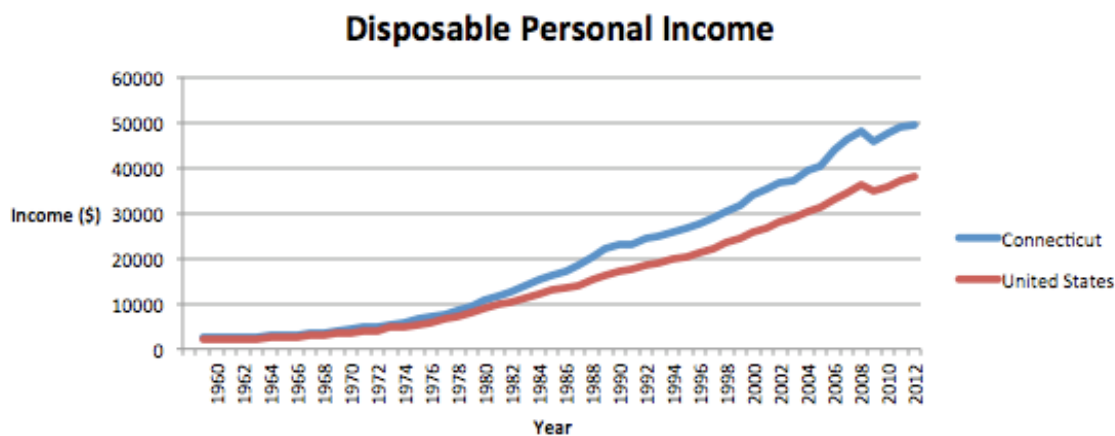


Another essential factor to both the economy and the housing market is the unemployment rate. Unemployment measures the rate of workforce members who are unemployed and actively seeking jobs. Historically, when economies have performed well, the unemployment rate exhibits a natural rate, consisting only frictional and structural unemployment (essentially, unavoidable unemployment).

In the United States, the historical average for unemployment since 1976 is 6.5%. However, this has not been a steady 6.5%, as there has been much fluctuating of this rate, peaking at 10.8% in the early 1980's and dropping to as low as 3.8% in 2000. However, recently we have seen a rise in unemployment, as since the crisis of 2008 we have seen an average unemployment rate of 8.7%, and a current rate of 7.6% in March of 2013. To put this into perspective, in the 10 years approaching the crisis, the highest level of unemployment in the United States was 6.3%, with an average of 4.9%. While Connecticut has historically maintained lower levels of unemployment than the United States (5.4% since 1976) the state was not able to escape the crisis of 2008 unharmed. Since the crisis of 2008, Connecticut has maintained an average unemployment rate of 8.4%, three percentage points higher than its historical average. However, Connecticut has seen a downward trend in unemployment levels, as unemployment now stands at 8.0% in March 2013. If this trend can continue, it bodes well for Connecticut, because if employment rises, the need for homes will rise as well.



The external force that is most closely related to the housing market is the United States Mortgage Rate. Mortgage Rates are often a function of several economic factors, such as inflation, interest rates, GDP, unemployment rates, behavior of equity and bond markets, CPI and PPI. Taking all this into consideration, the United States has historically held much higher home mortgage rates than it does today. However, while low rates may allow people easier access to homes, the lower rates do not guarantee success for the market. In March 2013, the United States 30-year mortgage rate was 3.57%, well below the historical average of 8.64%. However, due to extremely low interest rates (10 Year-Treasury Rate of 1.66%) coupled with a significant decline in the ease to obtain a mortgage loan, the market has not been able to benefit from these low rates. These mortgage rates are expected to remain low in the near future, allowing for a potential rebound if economic conditions strengthen.



The final external factor analyzed is the Per Capita Disposable Income. In theory, the more disposable income people hold, the better the housing market performs, as houses become more affordable. This holds true, as Connecticut has maintained Disposable Income Rates 25.6% higher than the national average since 1959, leading to a superior housing market. Recently this discrepancy has become even more apparent, as Connecticut has been above 30% over the national average since 2006. This bodes well for Connecticut, as they seem like the most likely candidate (if any) to experience a rebound in the housing market, due to their abundance of disposable wealth.

Fundamental Analysis of Housing Market in Connecticut

Overall, Connecticut has managed to sustain some success in the early goings of 2013. In the first quarter of 2013, pending sales of single-family homes rose 17.1% over the first quarter of 2012. While 2012 was one of the worst years in recent memory, it is significant to note that the market is beginning to rebound. Additionally, deposits on condominiums rose 29% to 1790 contracts, which is the highest total in the last three years. This is vital, as it signifies that the drop in price for homes in Connecticut is finally met by an increased demand (sales up 8.8% from a year ago), positive signs for the market. In addition to this, recently financial institutions have began approving more housing loans. While the “zero down payment” loan is most likely extinct, loans will be more accessible to the average person. Median prices in Connecticut have also stabilized in the first quarter, due to a full year of consistent growth in both the number of deposits and the number of closings. This consistent growth is the key to prices approaching levels of equilibrium, and it remains to be seen if this growth can be maintained for successive years.

While there were several positive market movements from the first quarter of 2013, there also were several negative indicators. Even though single-family home sales rose and condominium deposits rose, the rental market took a hit, with rental leases dropping by 2.6%. This possibly has correlation with the rise in housing sales, as more people are finally able to afford houses due to the low prices.

Additionally, foreclosures in Connecticut continued to rise, as they have the 7th highest rate in the country, and 2nd in New England behind Maine. Lastly, Connecticut's luxury market has remained unchanged, thus furthering the theory that people are seeking the most affordable homes in Connecticut. If the demand for affordable homes continues to rise, than eventually so will housing prices, and the market will correct itself. This self-correction could stunt the growth within the housing market in Connecticut and lead to further issues.

Forecast of the Connecticut Housing Market

As a whole, there are both positive indicators and negative indicators surrounding the state of the Connecticut Housing Market. Internally, Connecticut appears to be in significantly better shape than the United States in terms of Housing. However, that is not very significant, as both are still feeling the ill effects of the crisis of 2008. Externally, the United States is not where it should be economically, and until it sustains any form of long-term success, any excessive optimism must be curbed. However, positive signs are present so far in 2013, as the stock market has performed well (S&P 500 up near record highs of \$1,597), the United States Dollar has appreciated significantly, Unemployment is down in April (7.5%) due to the creation of 165,000 jobs and the housing market seems to be heading in the right direction. Fundamentally, Connecticut has shown signs of rebounding, but these rebounds are in very small sample sizes, and must be maintained in order to consider Connecticut's Housing Market Stable.

Based on all these factors, one cannot expect any significant growth in Connecticut's Housing Market in the near future. A more realistic expectation would be slight growth in 2013, stimulated by lower unemployment rates, lower housing prices, GDP Growth, high levels of disposable income, an improved single-family home market and increased deposits on condominiums. This slight growth in 2013 would most likely be followed by increased confidence in the years following, which could stimulate a significant rebound in the Housing Market. All of this is growth is dependent on the state of the United States Economy, which appears to be recovering at a slow pace.

The Financial Sector: Connecticut's Comparative Advantage?

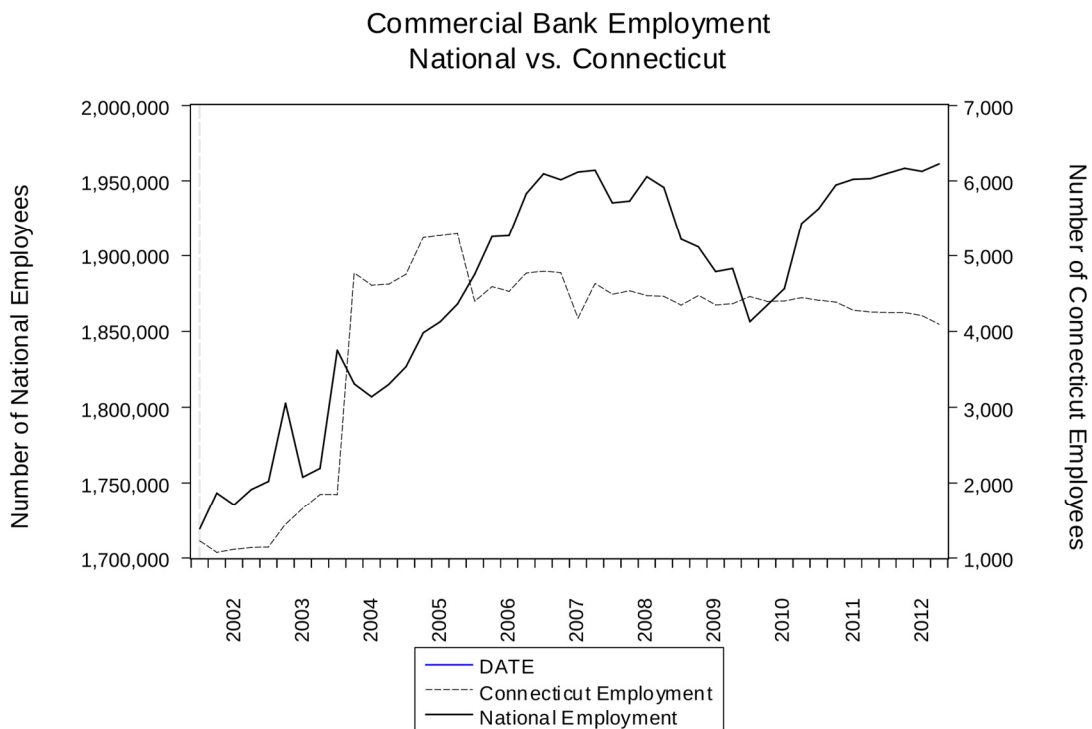
by Vincent D'Agnese & Gregory Nunn

Employment in National Commercial Banks:

Employment in national commercial banks rose from 1.719 billion employees in 2002 to 1.961 employees currently today. Over this ten-year span, we saw an increase of 14% in national commercial bank employment.

Employment in Connecticut Commercial Banks:

Employment in Connecticut commercial banks rose from 1.224 million employees in 2002 to 4.094 employees currently today. Over this ten-year span, we saw an increase of 234% in Connecticut commercial bank employment.



Total Bank Assets in National Commercial Banks:

Total national commercial bank assets were 6.488 trillion dollars in 2002, compared to 13.391 trillion currently today. Over this ten year span, we saw total bank assets in national commercial banks rise 106%.

Total Bank Assets in Connecticut Commercial Banks:

Total Connecticut commercial bank assets were 3.932 billion in 2002, compared to 27.176 billion currently today. Over this ten year span, we saw total bank assets in Connecticut commercial banks rise 591%.

What does this mean?

Over the past ten years we have seen a robust increase in assets among all commercial banks in the United States. This increase is a direct cause from a weaker supply of credit within commercial banks. Since the recent financial crisis in 2008, we have seen a weaker credit supply for mortgage loans as well as declining interest rates across the board. This activity may suggest an end to some of the asset dumping that took place during the recession, when banks that chased growth as they made loans and collected deposits, freeze.

As total bank assets soared, we saw the United States government step in and adopt a few programs that were designed to strengthen the financial sector. In 2008, President George W. Bush signed the Troubled Asset Relief Program (TARP) into law. This program, as well as the Quantitative Easing Programs that we have seen, are simply components of government measures to address the subprime mortgage crisis.

Simple Leverage Ratio in National Commercial Banks:

Simple leverage was measured by total bank assets to total equity capital. Throughout 2002 to 2004 we saw 10x leverage among national commercial banks. Since then, national commercial banks are currently leveraged at 8.91x.

Simple Leverage Ratio in Connecticut Commercial Banks:

Connecticut commercial banks have averaged right around 8x leverage throughout the past ten years. We have seen a slight increase in Connecticut commercial leverage currently hanging around 9.92x leveraged.

National vs. Connecticut:

Connecticut banks are more leveraged when compared to that of national banks and it would be correct to assume that Connecticut banks may be more exposed to interest rate risk. If the Federal Reserve were to raise interest rates, Connecticut banks will most likely suffer a sharper decline in assets compared to that of national commercial banks simply because they are highly leveraged.

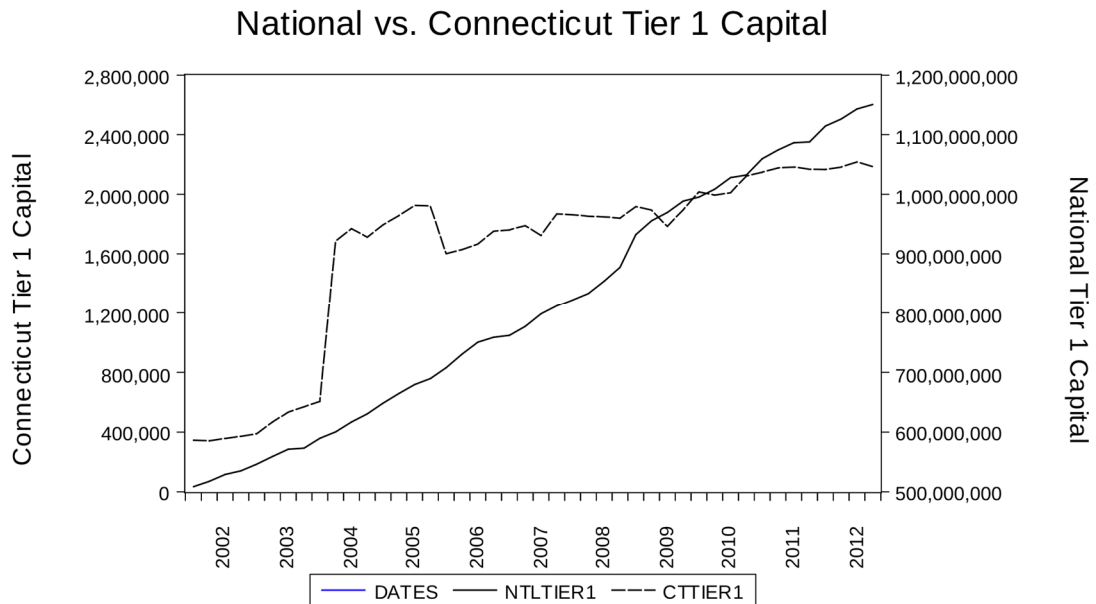
Solvency Indication:

Since the recent financial crisis, it is reasonable to assume that the financial crisis currently experienced by U.S. commercial banks was one of solvency. Solvency is often referred to as solvency risk and is what banks consider long-term viability. If a commercial bank takes on bad loans or its security portfolio declines in value, then its capital accounts, which are designed to absorb these losses, become stressed. As investors and depositors become aware that this is going on, they may withdraw their funds and the bank will become insolvent and most likely fail. Solvency among commercial banks was measure by comparing tier 1 capital to risk weighted assets. It could also be calculated by tier 1 & 2 capital to total risk weighted assets.

The Basel Committee on Banking Supervision has issued Basel II and Basel III scenarios, which are recommendations on banking laws and regulations. These were intended to create an international standard for banking regulators to control how much capital banks need to put aside to guard against the types of financial and operational risks banks face.

National vs. Connecticut:

Nationally, we have seen an increase in solvency over the past ten years from 10% to 12.8% currently. In the state of Connecticut we have seen a decrease in solvency that peaked in late 2003 at around 19% to its current level of 13.6%. Solvency is trending downward in Connecticut when compared to that of national commercial banks. From these numbers, we can see that commercial banks are meeting Basel III requirements, but barely. There is still room for improvement in solvency among commercial banks.



Tier 1 capital is the core measure of a bank's financial strength from a regulator's point of view. This is composed of core capital, which consists primarily of common stock and retained earnings.

Asset Quality:

Asset quality in commercial banks is calculated from taking non-current loans and leases to total bank assets. Nationally, we saw a peak in asset quality in 2010 before dropping down to its current level of 1.91%. In the state of Connecticut we also saw asset quality peak in 2010 before falling to its current level of 1.2%. National banks currently have a better overall quality of assets than that of banks in Connecticut.

The recent decline in asset quality could be directly attributed to the high amount of foreclosures as well as the current weak supply of credit among these institutions. Asset quality has fallen since the crisis due to extravagant lending prior to the recession.

Connecticut's People's United Bank & Webster Bank:

Asset quality and profitability conditions of Connecticut's two largest banks outperform those for the average U.S. banks. While the average national ratio of non-current (past 90 days due) loans to total loans was reported at 3.66% for the US, it was considerably lower for People's United Bank at 2.0% and Webster at 1.61% (based on Federal Reserve Bank Regulatory Data for Q4 2012). People's has been more profitable than the average national banks, with its net interest margin (NIM) reaching 3.93% in Q4 2012. At the same time, Webster's NIM was at 3.35%, roughly comparable with the national banks' level of 3.37%.

People's United Bank is the largest banking institution in the State with its total assets reaching \$30.1 billion. Webster is the second largest with \$20.1 billion of total assets (based on FDIC Q4 2012 data).

Both banks comply with the minimum core (Tier 1) capital to risk-weighted assets ratio implied by Basel III. The effective minimum core capital ratio is set forth by the Basel Committee at 11% (6% base ratio, plus both the conservation buffer and the countercyclical buffer at 2.5%). People's core capital ratio is currently at 12.2% (based FDIC Q4 2012 data) and Webster's at 11.6%. The total capital to risk weighted assets ratio is set by Basel III at 13% (8% baseline, plus the two buffers of 2.5%). People's total capital ratio of 13.1% barely satisfies this minimum requirement, while Webster fails short of this benchmark with its ratio of 12.8%. Moreover, Webster funding sources rely more heavily on borrowed funds than on deposits. It has 4.99 times more deposits than total borrowings, while the same multiplier for People's is 6.75. In essence, People's depository base is more solid than Webster's and its reliance on borrowed funds is less pronounced, which makes the largest State bank more resilient to possible adverse effects (i.e. the elevated

interest rate risk) of the departure of the Federal Reserve from its current quantitative easing policy course at some point in the future.

Worrisome for solvency are also excessive holdings of derivatives by Webster reaching the level of \$9,834 million – considerably higher than People’s \$2,963 million.

In sum, People’s is more profitable and better capitalized than Webster. For these reasons, it is likely to withstand possible adverse effects of the policy reversal by the Federal Reserve. However the generally favorable profitability and solvency conditions of Connecticut’s largest banks will be likely compromised if the Federal Reserve exits from its current zero-lower-bound interest rate, ultra-easy monetary policy.

Net Interest Income of Connecticut Banks

Net interest income was calculated by subtracting total interest expense from total interest income. National commercial bank profitability has risen 64% over the past ten years compared to an increase of 551% in profitability among Connecticut commercial banks. Connecticut commercial banks have been more profitable for a few reasons. Firstly, since the recent financial crisis there has been 483 failed government assisted banks, zero of which have been in Connecticut. Furthermore, Connecticut banks saw a lift in interstate lending regulations in 2004 that only allowed Connecticut banks to lend within the state of Connecticut. Since 2004 we have seen a huge jump in total interest income within Connecticut commercial banks.

Commercial banks are most likely to remain profitable after the Federal Reserve announced on May 1st 2013 that they will continue their asset purchasing program of purchasing \$85 billion of treasuries and mortgage-backed securities each month into 2014.

Summary:

Over the past ten years, we have seen a steady increase in employment within the commercial banking sector. National employment is up 14% in these institutions while Connecticut employment is up 235%. We have seen a robust increase in assets among all commercial banks in the United States. This increase is a direct cause from a weaker supply of credit within commercial banks. Since the recent financial crisis in 2008, we have seen a weaker credit supply for mortgage loans as well as declining interest rates across the board. This activity may suggest an end to some of the asset dumping that took place during the recession, when banks that chased growth as they made loans and collected deposits, freeze.

As total bank assets soared, we saw the United States government step in and adopt a few programs that were designed to strengthen the financial sector. In 2008, President George W. Bush signed the Troubled Asset Relief Program (TARP) into law. This program, as well as the Quantitative Easing Programs that we have seen, are simply components of government measures to address the subprime mortgage crisis.

Since the recent financial crisis, it is reasonable to assume that the financial crisis currently experienced by U.S. commercial banks was one of solvency. Solvency is often referred to as solvency risk and is what banks consider long-term viability. If a commercial bank takes on bad loans or its security portfolio declines in value, then its capital accounts, which are designed to absorb these losses, become stressed. As investors and depositors become aware that this is going on, they may withdraw their funds and the bank will become insolvent and most likely fail. The Basel Committee on Banking Supervision has issued Basel II and Basel III scenarios, which are recommendations on banking laws and regulations. These were intended to create an international standard for banking regulators to control how much capital banks need to put aside to guard against the types of financial and operational risks banks face. Currently, commercial banks are meeting Basel III standards, but not by much. There is still much more room to increase solvency within our commercial banks.

Asset quality in commercial banks has decreased substantially since 2010. Nationally, we saw a peak in asset quality in 2010 before dropping down to its current level of 1.91%. In the state of Connecticut we also saw asset quality peak in 2010 before falling to its current level of 1.2%. National banks currently have a better overall quality of assets than that of banks in Connecticut. The recent decline in asset quality could be directly attributed to the high amount of foreclosures as well as the current weak supply of credit among these institutions. Asset quality has fallen since the crisis due to extravagant lending prior to the recession.

Net interest income has risen among commercial banks as we are seeing them become more profitable. National commercial bank profitability has risen 64% over the past ten years compared to an increase of 551% in profitability among Connecticut commercial banks. Connecticut commercial banks have been more profitable for a few reasons. Firstly, since the recent financial crisis there has been 483 failed government assisted banks, zero of which have been in Connecticut. Furthermore, Connecticut banks saw a lift in interstate lending regulations in 2004 that only allowed Connecticut banks to lend within the state of Connecticut. Since 2004 we have seen a huge jump in total interest income within Connecticut commercial banks.

Commercial banks are most likely to remain profitable after the Federal Reserve announced on May 1st 2013 that they would continue their asset purchasing program of purchasing \$85 billion of treasuries and mortgage-backed securities each month into 2014.

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