



*Will Connecticut Thrive in an Uncertain World:
Exchange Volatility, Shifting Labor Markets,
And Collapsing Oil Prices*

The Connecticut Economic Outlook: February 2015

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Introduction

Is Connecticut on a roll? The state has enjoyed more than four years of continuous, month over month, job growth, adding a stunning 25,000 jobs in 2014. Since the end of the Rell Recession—a four year contraction, among the worst in the nation, that only ended in 2011, more than two years after the national recovery began and cut nearly 9% from state output—Connecticut has grown steadily, apparently faster than any of its northeastern neighbors, save Massachusetts.

Preliminary estimates for 2014 show Connecticut growing faster than the national economy and then surging by a stunning (and dubious) 8.1% in 2015, before tapering off to 3.2% growth in 2016. Connecticut might now be on a strong growth trajectory, driven by biotechnology, aerospace engineering, venture capital, and a significantly more competitive environment. But if history predicts a rosy future, the array of downside risks is unusually long.

Before looking closely at the Connecticut forecast, we need to consider that the reality we live in is an increasingly unstable and uncertain world, whether politically because of ISIS, the Ukraine, and other hot spots, or economically, with dramatic volatility in currency markets, the threatened deflation in the Euro zone—if not the collapse of the monetary union itself—a stunning fall in not just oil prices, but most commodities, and nearly unprecedented shifts in exchange rates. The dramatic economic dynamics are themselves feeding back into political instability and conflict. Have we seen this dynamic before?

A century ago, adoption of disruptive technologies in manufacturing (automobiles and other mass-produced goods), communications (telephones), and transportation (railroads, airplanes, diesel-powered ships, etc.) fundamentally transformed the world and power relationships. The great powers of those days – Germany, Austria-Hungary, France, Britain, Russia, Italy and the Ottoman Empire – mechanized their armed forces and sought to incorporate new technologies into everyday life. Leaders accustomed to bluffing among these Great Powers remained incapable of controlling extra-nationalist terrorists in their midst. Few leaders in early 1914 foresaw that within months Europe would be engulfed in the horrors of the Great War, let alone stalemated for years within entrenched quagmires.¹

A century later, national leaders still (or again) are failing to control sophisticated resident terrorists who use increasingly diversified methods to attack and destabilize societies, highlighted by recent terrorist attacks in France and Denmark, as well as political antics surrounding the recent Olympics and continuing commercial battles to attract or regain trading block partners, access routes, control of administered prices of fossil fuels midst shifting global supplies, and claims of religious superiority.

In contrast to a century ago, the current direction of state and American national employment transitions have shifted from manufacturing in favor of services. Inter-related forces facilitating this transition include sophisticated robotic processing and manufacturing, outsourcing, increased leisure time to enjoy various pursuits (such as life-long learning), digital compression, advanced biotechnologies and major improvements in global enhancement of communications and memory, as well as medical treatments to extend life, all providing consumers with manifold choices. Militarily there is also hope (or risk) that the United States and most of its allies now are both working to reduce nuclear stockpiles and downsizing

¹ Margret Mac Millan **The War that Ended Peace: The Road to 1914**, pb. Allen Lane, 2013. While several hawks foresaw the Great War, in 1914 the vast majority them expected and were preparing for it further into the future and did not expect the rate of escalation following the initial hostilities between Serbia and the Austria-Hungarian Empire.

rather than mustering and extending their standing armies as the Great Powers did leading into the debacle a century ago.

This *Outlook* considers the potential impacts of the price of fossil fuels, the US dollar exchange rate, and trends in service industries in Connecticut and the nation. Between (approximately) 2000 and 2013, America's economy experienced a revolution in its service sectors. The shift was profound. Nationally, employment in manufacturing shrank by nearly a quarter between 2000 and 2010, dropping to nearly 12% of all jobs, while private sector service jobs surged to nearly 65%. By 2013, private sector service jobs increased their share another 9%, accounting for 71%; in Connecticut—still known for the strength of its manufacturing sector—the share of service job reached 72.5%. At the same time, between 2007 and 2013, wages in every service sector in Connecticut, save one, either grew significantly slower than the national pattern or actually shrank. But questions remain how well economists and policy analysts understand the service economy's dynamics.

This analysis suggests that despite improved data collection and advances in statistical methodology, the risks to the *Outlook* forecast are only marginally less than they would have been a century ago. In other words, while extensive progress has been made in the social sciences—including statistical forecasting²—world economies are still fraught with uncertainty, as shifting prices and new knowledge continue to drive unexpected change, and new technologies lead to paths never before imagined. Perhaps the economy has “progressed.” However, in light of the challenges Connecticut and the nation now face, we must ask ourselves what “progress” truly means and if and how Connecticut's high-income status relative to the rest of the nation can be maintained? Although these factors are not directly linked to the *Outlook's* model, they are essential in framing its interpretation.

Lowering of International Prices of Fossil Fuels

Essential to understanding any cartel—in this case OPEC—controlling, or at least significantly influencing, international prices, is that it preserves its influence only so long as its most prominent members cooperate and perceive such actions to be in their best interests. In the face of ISIS, Al-Qaeda, and similar organizations being financed from petro-dollars, Middle Eastern powers most closely aligned with the United States have recognized inherent threats to themselves. One way to curtail financing for extraterritorial revolutionaries is then to lower the petro-dollars flowing to their funders and arms providers. Coincidentally, lowering the price of fossil fuels will also curtail competitive international supplies from emerging. Thus, with very low costs, the Saudis refused to curtail output in 2014 to offset dramatically increasing supplies from the United States and Canada; the result cut oil prices by half. Just how long these low prices will last before OPEC (i.e. Saudi Arabia) once again tightens its grip on international supplies is unknown. In the interim, private sector investors incur considerable risks if they ignore such likely events. Meanwhile, the international economy, which had adjusted to high prices on fossil fuels, is left in moderate disarray, which carries with it its own set of risks.

Exchange Rates

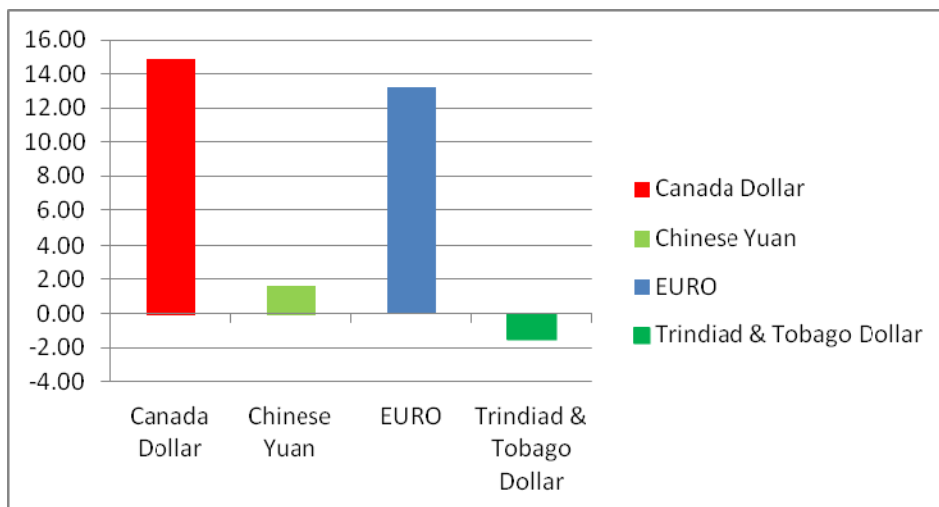
Confounding these shifts, international exchange rates have adjusted quickly. More specifically, with emerging new supplies of its own, the United States dollar has massively appreciated relative to currencies of international crude oil suppliers and in response to European problems. Chart 1 highlights a few of these shifts over the last 6 months. Even though Trinidad and Tobago is a major supplier of fossil fuels, it

² For additional commentary on this topic, see Alan Greenspan **The Map and the Territory**, pb. Penguin Press, 2013, among others.

specializes in LNG supplies where prices have been more stable than for crude oil based on expectations of US LNG export terminals being completed, giving US suppliers access to international markets where prices are higher than in North American markets.

The appreciation of the US dollar relative to its major trading partners will combine with lower fossil fuel prices to depress US domestic price pressures without intervention by the Federal Reserve through raising interest rates. These pressures exacerbate US concerns about falling prices or deflation. Concern arises out of the potential that as prices fall, consumers become better-off the longer they wait to make purchases, thus constraining demand and causing further potential damaging price reductions. Deflation also over time increases the real value of fixed assets such as bonds and preferred stocks with stable dividends, a reversal of the impacts of inflation, to which markets have been accustomed and which economist generally view as crucial for sustaining a healthy economy and growth.

**Chart 1: Exchange Rate Adjustments of Major US Trading Partners:
(% Change First Trading Day of September 2014 – February 2015)**



Average Weekly Earnings by Service Industry

The services sector has diversified with certain industries yielding considerably higher average weekly earnings than others. Using 2013 Connecticut manufacturing average weekly earnings for all manufacturing workers (\$1,209.42) and production workers (\$893.39) as benchmarks, it is possible to shift to either higher paying or lower paying positions in services as noted in Table 1. This table clearly shows that in two Connecticut service industries – Professional and Business Services and Financial Services - average weekly earnings exceeded those paid to production workers in Manufacturing. Two other industries – Trade, Transportation and Utilities (TTU) and Education, Health and Social Assistance - average weekly earnings are comparable with manufacturing production earnings. Leisure and Hospitality³ and Other Services paid less. Segments within these industries experienced higher or lower average remuneration. There are no Connecticut data on Information Services earnings, but earnings in surrounding states and nationally are high compared to manufacturing production workers.

³ The paucity of the hospitality and Leisure earnings has always been suspect because of loose accounting practices arising from TIPS, albeit that is tightening up with increased use of credit and debit cards for paying gratuities.

Table 1: Average Weekly Earnings by Service Industry

	TTU	Information	Professional and Business Services	Financial Services	Education, Health and Social Assistance	Leisure and Hospitality	Other Services
Connecticut							
2007	751.64		989.06	1,411.71	735.39	422.00	681.70
2008	758.34		1,072.61	1,510.86	757.99	414.65	689.17
2009	733.13		1,016.32	1,481.05	791.17	403.71	647.82
2010	761.46		1,009.01	1,517.91	796.66	400.60	648.41
2011	871.23		1,047.42	1,573.04	816.69	404.59	626.16
2012	875.83		1,057.12	1,543.06	815.13	394.89	630.51
2013	818.57		1,060.43	1,598.48	786.86	392.93	663.42
CARG (%)	2.6		0.7	1.7	1.4	-1.1	-1.0
USA							
2007	641.51	1,014.35	874.68	937.69	710.62	323.54	578.84
2008	651.96	1,047.50	909.23	956.67	739.33	330.32	597.13
2009	659.78	1,073.27	947.10	971.73	733.12	331.64	618.18
2010	672.58	1,114.65	963.57	1,004.14	745.88	336.83	637.65
2011	692.51	1,156.56	991.87	1,039.70	768.79	342.67	649.87
2012	709.33	1,166.45	1,013.76	1,093.00	789.16	349.12	659.49
2013	723.49	1,206.64	1,029.13	1,119.77	799.66	350.89	679.08
CARG (%)	2.09	2.94	2.72	3.14	1.92	1.39	2.63

Source: BLS, Current Employment Statistics (Nation, State and Metro Area data). "CAGR" stands for constant average rate of growth. 2014 Annual data are not available at time of publication.

Within the seven-year period shown in the table below, Connecticut's wage and salary gap among service industries generally widened with *negative* rates of growth, measured at constant average growth rates (CAGR), for the two lower wage industries (Leisure and Hospitality and Other Services). While recent changes to the minimum wage will redress some that trend, doing so may restrain employment growth in those industries. Growth rates for weekly earnings have been positive in other service industries, particularly TTU and Financial Services. For each service industry except TTU, national average growth rates in average weekly earnings *exceeded* those in the state. As a result, in Connecticut earnings fell back toward national levels and in Education, Health and Social Assistance as well as Other Services fell below national levels. Thus Connecticut is increasingly competitive in labor costs.

By 2013, national Manufacturing average weekly (\$994.42) earnings exceeded those of all state manufacturing workers with the subset of national production workers earning \$807.67. With the addition of Information Services, the same service industries as in Connecticut had higher earnings than those earned in manufacturing. Unlike the Connecticut situation, the average weekly earnings in the remaining four national service industries fell below national manufacturing standards during the last seven years. Given these relative levels of weekly earnings among service industries, the impact on overall remuneration from the employment shift to services will clearly depend on what service industries are expanding, both nationally and within Connecticut, to determine the overall influence on incomes of shifting to services from manufacturing.

Services Employment Expansion: Connecticut and the National

Both Connecticut and American employment has become increasingly concentrated in services in the 21st century, as Charts 2 and 3 profile.

Chart 2

Connecticut Employment Shifts: Percentage Shares

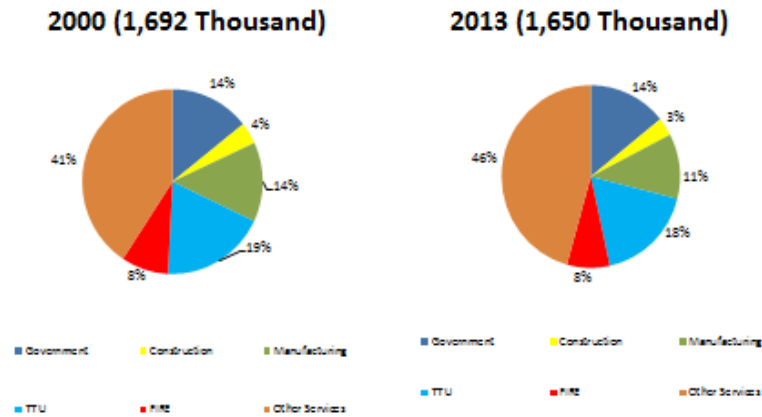
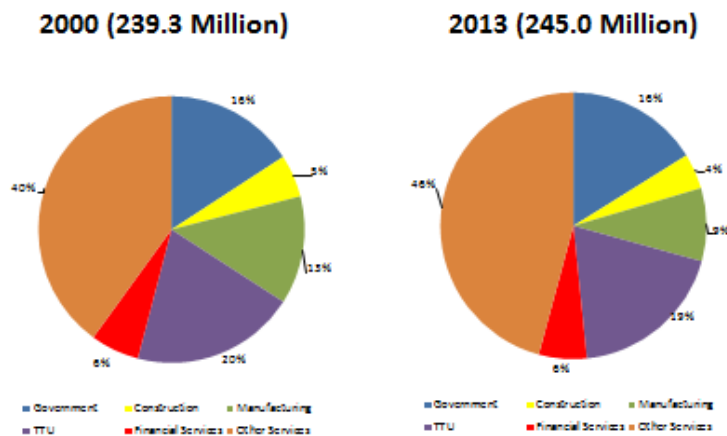


Chart 3

US Employment Shifts: Percentage Shares



Over the last 13 years, service sector employment in Connecticut increased from 68% to 72% of total employment at the expense of Manufacturing and Construction, a contrast to the US shift to services of

66% to 71%. Beyond the shifts in sector shares in each jurisdiction, in contrast with decreasing employment in Connecticut, national employment has risen.

In the above charts, all sectors but government are private and all but construction and manufacturing are in private services. In each jurisdiction, government employment as a share of total employment has remained constant from 2000 to 2013, but both construction and manufacturing employment shares have dropped. Construction's share has fallen by a single percentage point and manufacturing's by 3% in Connecticut and by 4% nationally with offsetting increases in services.

Of the three private services sectors, there has been a one percent shift of those employed out of trade, transport and utilities (TTU) while the shares in financial services have remained even at 8% in Connecticut, 6% for the nation. Increased shares have been concentrated in other services at 5% in Connecticut, 6% for the nation. Decreased employment in utilities results from management layoffs, installation of smart meters, and early stages of replacing short-life street-lighting with longer lasting lamps. Meter reading personnel have become redundant with increased capabilities to carry out those functions effectively and efficiently using telecommunications capabilities of the electrical distribution network. Installation of LEDs will increase life expectancy of street lamps 5-10 times reducing staff needed to replace them.

In Connecticut and the nation, employment has shifted to other private sector services (46% of employment in 2013⁴), primarily from Manufacturing but also from Construction and TTU.

For reasons noted above, Charts 4 and 5 illustrate that Connecticut and national employment within private sector services has become less concentrated in TTU with a 3% decline of private services employment. Further, employment in information services has declined by a percent for both Connecticut and the nation, particularly in newspaper staffs and their distribution networks with increased use of electronic media. A notable divergence emerged between state and national shares in professional and business services with the nation remaining at 19% while the state shares have fallen from 19% to 17%. This may reflect the capacity of recent CT retirees to really retire and to move to warmer climes, where the latter is not reflected in those migrating within the United States.

Employment has become more concentrated, with leisure and hospitality's share experiencing a single percentage gain, and markedly so in education, healthcare and social assistance with 6% increase in shares in Connecticut, a 4% increase nationally. Within Connecticut's shift to Service Sector employment in Education, Healthcare and Social Assistance, the growth rate has been stronger in Education (3.6%) as opposed to Healthcare (1.9%) and Social Assistance (2.2%). The employment shift toward education is consistent with life-long-learning and greater percentages of students remaining in school longer, despite shrinking shares of population in younger age cohorts. Extending education provides opportunities for such employers to operate interactively with the educational institutions by attracting work-term students as part of their introduction to the future of those companies and to retain them over additional work terms, then converting well-trained employees upon graduation to full time.

The concentration of services sector growth within Education and Healthcare limits the erosion of incomes that would occur with employment shifts to lower paying services; the opposite is true for the one percent shift to Leisure and Hospitality. Within tripartite industry grouping, the CAGR for National education of 3.3% exceeded those for social assistance at 2.2% and healthcare at 1.9.

Connecticut's greater emphasis relative to the nation on education sets the stage to retain and attract industrial brain-trusts embodied in research laboratories and head offices.

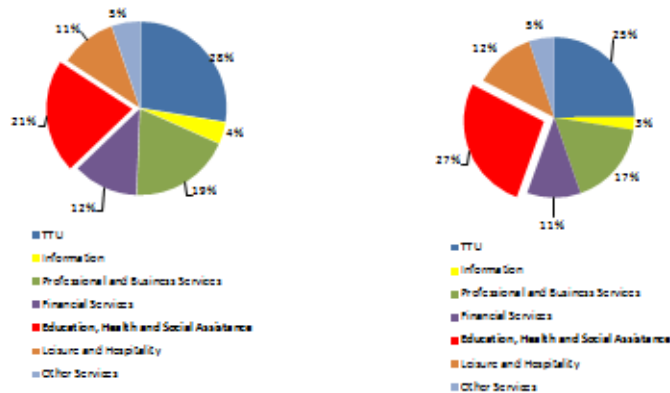
⁴ All 2013 employment numbers are preliminary as either published by the BLS or aggregated as monthly averages using December data that are also preliminary.

Chart 4

Connecticut Employment in Services % Shares

2000 (1,150 Thousand)

2013 (1,196 Thousand)

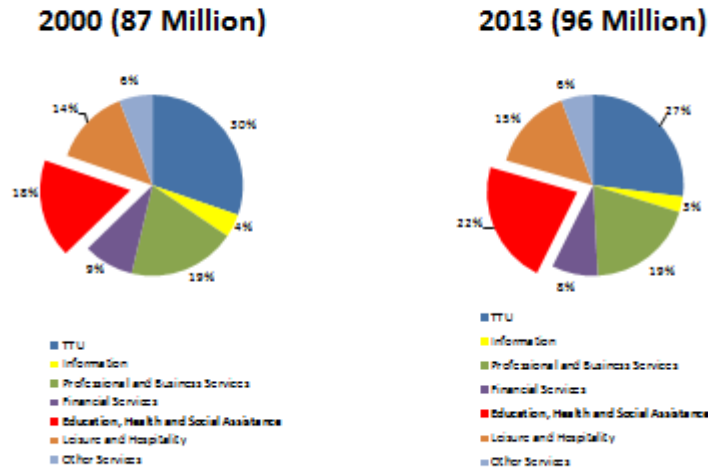


National shifts of employment within Private Sector Services are similar in direction to those in Connecticut but smaller in percentage terms, with no erosion in Professional and Business Services. In both years Education, Healthcare and Social Assistance constituted a smaller share of services in the Nation than in Connecticut. Chart 5 reveals employment shifts within US services. The single percent losses in both Information Services and Financial Services curtail high-end jobs while the major shift to Education, Healthcare and Social Assistance enhances incomes relative to average weekly earnings in TTU. However unlike Connecticut, where the concentration of the growth within in Education, Healthcare and Social Assistance is in Education, national growth is more concentrated in Social Assistance with a CAGR of 3.7% compared to Education at 2.5% and Healthcare at 2.3%. Connecticut's emphasis on Education as a vehicle for growth is captured in the greater share of employment dedicated to it, but also in sustained growth in well-paid services.

Within Services, the nation has larger shares of its employment concentrated in TTC and Professional and Business Services than does Connecticut. At the national level, those in TTC have relatively low weekly earnings compared to the national averages of those in Education, Healthcare and Social Assistance, so that the predominant net shift within the national services sector is likely to improve earnings. The opposite is true of the minor net shifting from employment in Financial Services to Leisure and Hospitality, which has the reverse impact.

Chart 5

USA Employment in Services % Shares



Outlook

This Outlook continues to deploy two models, the first using housing starts, then replaced in the second model by a gradually accelerating bank rate – about 68 basis points--over the eight quarters to the end of 2016. The second model produces more bullish results. Initial annual projections for national Real Gross Domestic Product (RGDP) growth using this approach generated preliminary data for 2014 at 2.4% followed by 4.85% for each of the years 2015 and 2016. These results are consistent with the University of Michigan expected 2.4% RGDP growth for 2014 and higher than its 3.3% growth for 2015.⁵ CCEA’s current projections are more optimistic than previous national projections because they more fully take account of early indicators for cuts in fossil fuel prices and assume those cuts remaining in place over the next two years. Moreover, should appreciation of the dollar hold, suppressing inflation by the Federal Reserve may require less monetary constraint than it has traditionally.

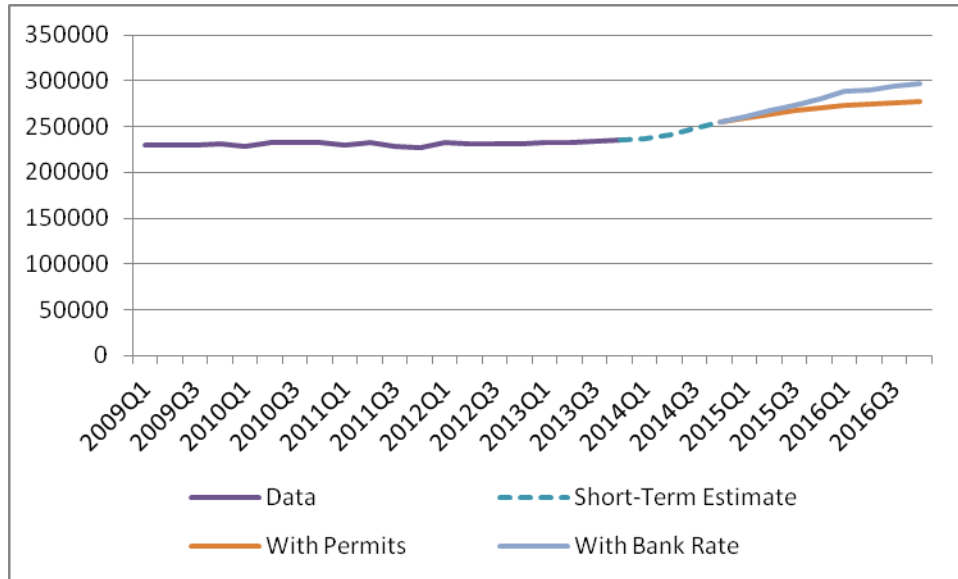
CTRGDP

The corresponding estimates for Connecticut Real Gross Domestic Product (CTRGDP) are noted in Chart 6 below. These figures may appear to be unfamiliar to the reader. Because the Bureau of Economic Analysis (BEA) has rebased all its state GDP data to 2009, the numbers are not comparative with earlier *Outlooks*. Less obvious is the basis for Connecticut growth that has been established over the last few years with the staffing up of several important initiatives such as UConn’s expanded Health Center, Jackson Laboratories, and co-location effects in biotechnology and aerospace engineering. With minimal change in housing permits, CTRGDP is projected as having grown 4.8% in 2014, and with the expectation of adding a whopping 8.1% in 2015, before tapping off to 3.2% in 2016. Expansion in 2015 also reflects a

⁵ RSQE, The U.S. Economic Outlook for 2014-015 Executive Summary: May 2014.

healthier financial sector, including bonuses as well as solid employment expansion in excess of previous highs. Given the extension of modest interest rates, that version of the model suggests even higher growth.

**Chart 6:
Connecticut RGDP (Millions Fixed \$ 2009)**



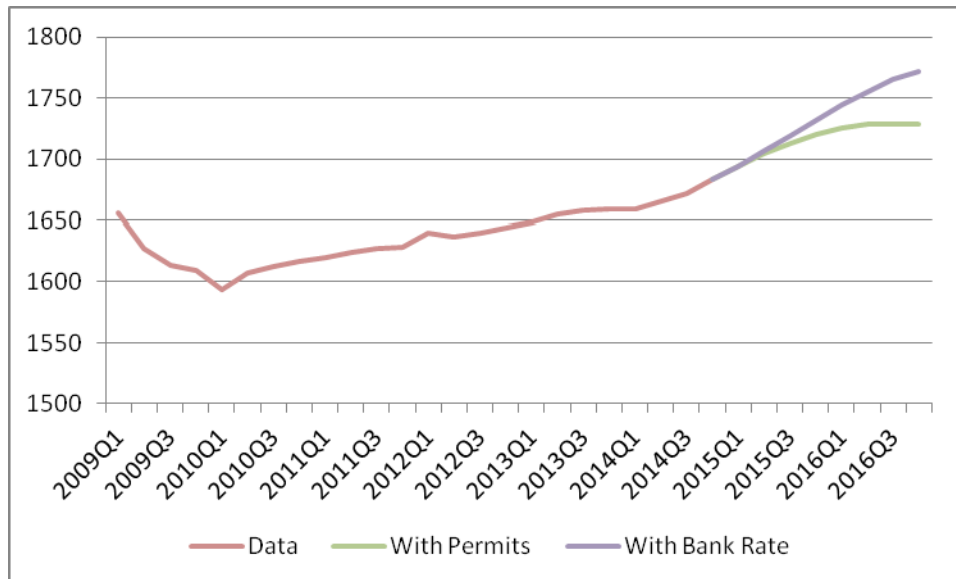
More robust national growth in keeping with the RSQE outlook would supplement Connecticut growth by \$360 million in 2014 and another \$366 million in 2015. The cumulated impact in 2015 would be \$0.7 billion and in excess of \$17.5 billion in 2016 shown in the graph. But, given the severe drop in U.S. growth rate in 2014Q1, this scenario is, frankly, unlikely.

Employment

Official unemployment percentages significantly understate the situation, due to discouraged workers dropping out of the labor force. In July of 2010, there were 1,950,927 participants in the Connecticut labor force. By July of 2014 labor force participation had declined to 1,900,492, a cut of over 50,000. If all those workers leaving the work force are treated as discouraged workers who, given the opportunity, would return to the labor force, Connecticut's unofficial but realistic unemployment rate for July 2014 would rise from the official 6.5% to 9.1%. [The national situation is no better; the labor force participation rate has fallen nearly four percent since 2007, which if maintained would translate into a national unemployment rate of more than 10%.]

In Connecticut, lackluster national recovery has curtailed growth expectations and limited state growth, though employment has been mildly recovering since October, 2010. CCEA's least spectacular outlook, based on unit housing permits, nudges the state close to its previous high employment levels, before flattening out at about 1,728 thousand employed. The alternative model while allowing for some interest rate creep bursts through previous ceilings, adding an additional 44,000 jobs to reach 1,772 thousand by 2016Q4.

Chart 7:
Connecticut Employment (1,000s)



As noted in Table 2, growth in Construction employment is expected to expand, consistent with ongoing public works, the rise in housing permits, and growth of the national economy. Commensurate with the recovery, employment expands in each of TTU and FIRE, though at slower rates. Following slight growth in 2014, Manufacturing and Resource employment stabilize, while Government employment expands following recent contractions.

The major employment expansions continue in the Other Services inclusive of planned educational expansions at UConn, including the medical school, and continuing growth at Jackson Laboratories.

Table 2: Sector Employment Actuals and Projections (Annual in 1,000s) 2009-2015

	Construction	Manufacturing	TTU	FIRE	All Other Services	Resources	Government
2009	54.9	171.8	293.1	137.6	721.0	0.6	248.2
2010	49.9	165.6	289.7	135.2	722.6	0.6	244.2
2011	51.5	166.4	292.9	135.0	738.4	0.6	240.3
2012	51.6	165.1	295.8	133.2	755.6	0.6	238.5
2013	53.8	163.8	298.7	131.7	767.7	0.6	238.5
2014	56.4	165.2	303.9	130.3	779.7	0.6	235.7
2015	59.9	164.4	309.7	131.1	798.4	0.6	248.8
2016	63.5	164.4	313.0	133.6	810.3	0.6	273.6

An Uncertain World: Risks to This Outlook

CTRGDP data for 2013 are preliminary and may be adjusted by the BEA. CCEA's extrapolations of the BEA data into the 2014Q1 may be biased upwards as profits fall, but are apt to have the opposite impact when profits are rising. Thus, while the approach has been slightly upward biased in the recent past, that tendency is unlikely to be the case for 2014 when profits have been recuperating. Such recuperation is however dependent on a quick reversal of the first quarter dip in nation's GDP. Any continuing downward pressures in 2014 could reduce the CTRGDP growth needed to achieve the indicated employment levels.

Serious government belt-tightening could severely damage Connecticut's robust recovery and thwart its opportunity to finally experience sustained employment growth. As mentioned at the outset, neither the depth nor the duration of the currently low prices for crude oil is known. The threat of the price rising introduces risks and uncertainties that add complexities in readjusting trade-flows, currency revaluations, and in making investments at home and abroad.

Reductions in major project construction and defense contracting⁶ could adversely impact Connecticut's economy. While increases in residential construction will offset some of the decline in government-driven construction projects, the safety net for specialized defense manufacturing is thinner.

While national vehicle sales show robust growth,⁷ consumers may be belt-tightening other expenditures to replace the heretofore aging light vehicle fleet.

Concluding Comments

For more than two decades, Connecticut has enjoyed essentially no net job creation—it is still below its peak of 2008, which barely exceeded the level twenty years earlier—and its growth in output has been at best modest. It has historically lagged the nation in achieving recovery—most strikingly in the latest cycle when national recovery began in mid-2009, but Connecticut's economy continued to contract until the end of 2011. But, perhaps surprisingly, Connecticut has been on what seems to be a powerful upward trajectory. The strongest confirmation was the nearly unprecedented creation of 25,000 new jobs in 2014, consistent with the estimated growth in output of 4.8%—well ahead of the national rate. Stunningly, the more optimistic forecasting model projects growth in output of 8.1% in 2015. We won't believe it until we see it—it is hard to see where Connecticut has in place the spare capacity to deliver that level of growth. But there now appear to be powerful processes of both internal growth in bioscience and external attraction through co-location: a major genome sequencing facility coming to Branford; an aerospace engineering firm opening offices in East Hartford; a surge of venture capital carrying Connecticut into one of the top targets measured on a per capita basis.

But Connecticut's failure for a generation to invest in infrastructure clearly handicaps the economy, its failure to have a coherent vision and implementation strategy for what is close to global leadership in installed fiber optic cable (100G capacity!) or exploit the potential to have the Holy Grail of IT: the high capacity, high speed network connected to that rarest of IT facilities—one with the electricity for power and water for cooling that permits co-location of massive data storage and high performance computing. The continuing weakness or even absence of quality data on company formation, economic dynamics, and demography profoundly undermines policy development and assessment. The current *Outlook* is the most optimistic forecast to come out of the modeling methodology to date. But there are unusually large potential downside risks to Connecticut's economy delivering on that forecast, and the state itself continues to undermine its own future with inadequate public sector investment, inattention to major strategic opportunities, and poor data: do we really understand how we are performing and what we might achieve?

⁶ Ana Radelet, *Defense Slowdown Hurts All of Connecticut*, **The CT Mirror**, June 12, 2014 reports that Connecticut firms contracted \$10.9B with the pentagon last year, down from \$12.9B in 2012 and \$12.0B in 2011.

⁷ The US National Automobile Dealers Association (NADA) reports *1.6 million light-vehicle sales in May 2014 – an increase of 15.8 percent from April 2014 and an increase of 11.2 percent over May 2013. May 2014 also was the month with the highest sales, so far, in 2014. May 2014 YTD light-vehicle sales amounted to 6.7 million, up 4.8 percent from a year ago. The May 2014 Seasonally Adjusted Annual Rate* (SAAR) for light-vehicle sales was 16.7 million. The last time the monthly SAAR value reached 16.7 million was in February 2007.*