

Alcohol Preferences – is drinking becoming part of our culture?

Problem/ Plan:

Consuming alcohol, in its various form, is vast becoming a vital part of New Zealand's culture. Tony Ryall, the Minister of Health in New Zealand wants to be able to predict the spending and amount consumed of alcohol in the next couple of years.

When did the recession start? The recession started at about December 2007 and ended in June 2009.¹ The economy was falling; less people were employed and hence had less available cash. The consumption of alcohol decreased, due to the recession, as money was tight and people were struggling. Also alcohol consumption is patterned to rise and fall with economic crisis.² But as the recession ends the amount of consumption of alcohol is expected to rise again. With more people in high-earning jobs drinking more than the recommended amounts than anyone else, due to stress.³

It is a well-known fact that alcohol and social events go together. But what alcohol do people like the best? Is it beer, wine or spirits? Or is it Alcopops, a new thing aimed at underage drinking. It mainly contains spirits and flavourings and juice in the beverages.⁴ These drinks are upping the amount of alcohol consumed in New Zealand. The Rugby World Cup affected the amount of alcohol consumed. With more people the amount of customers in restaurants and alcohol consumption increased.⁵ Also after the recession, beer was not consumed as much as it had less alcohol content and didn't give self-medication in times of distress⁶. Also we are becoming premium drinkers and drinking high quality brands of spirits as it has more alcohol content.⁷

The purpose of this investigation is to see how the recession has changed the amount of alcohol consumed in New Zealand. Is our culture is becoming one of drinking? What alcohol gets consumed the most?

Data:

The Alcohol data is from the New Zealand Statistics website. The values are the total amount of alcohol consumed in millions of litres by quarters.

The response variable I am choosing is Total Beer consumed, in millions litres and the explanatory variable is years, recorded quarterly throughout the year. I am going to compare the Total Beer consumed to the total amount of Spirits consumed as well as the total alcohol consumed.

¹ When Did the Great Recession End? <http://usgovinfo.about.com/od/moneymatters/a/When-Did-The-Great-Recession-End.htm>

² <http://ips.ac.nz/publications/files/09e5397d09d.pdf>

³ <http://www.guardian.co.uk/society/2011/jan/27/fewer-people-drinking-as-recession-hits>

⁴ <http://en.wikipedia.org/wiki/Alcopop>

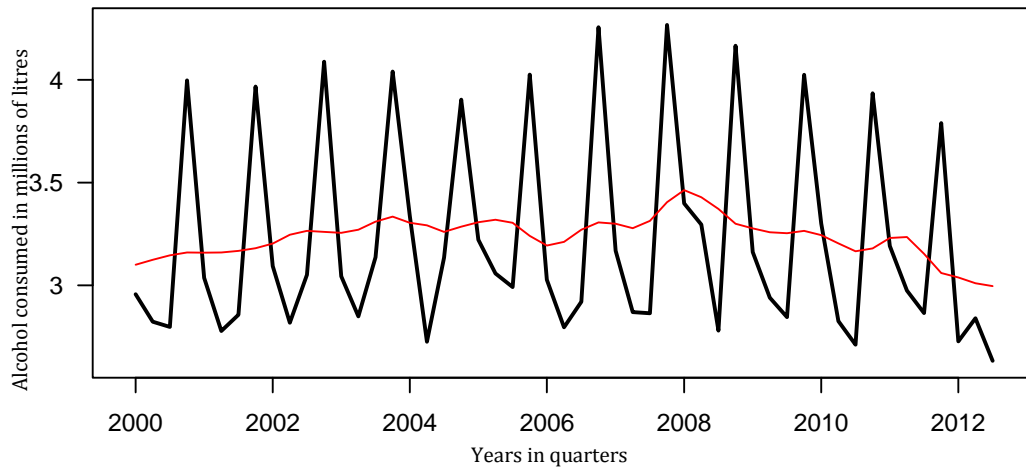
⁵ http://www.stats.govt.nz/browse_for_stats/economic_indicators/NationalAccounts/impact-of-rugby-world-cup.aspx

⁶ <http://www.beeronomics.org/papers/2A%20Anderson.pdf>

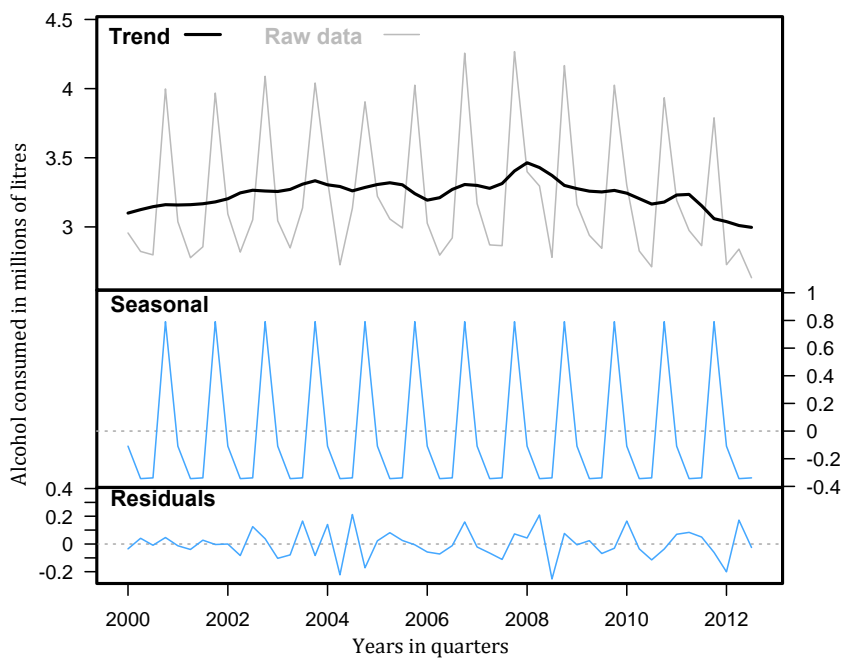
⁷ <http://www.stuff.co.nz/life-style/food-wine/5069833/We-re-becoming-premium-drinkers>

Analysis – Graphs:

Time series plot for TotalBeer

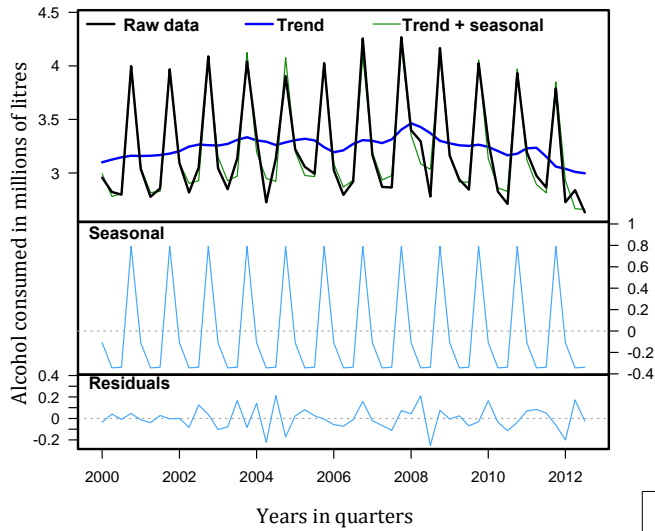


Decomposition of data: TotalBeer

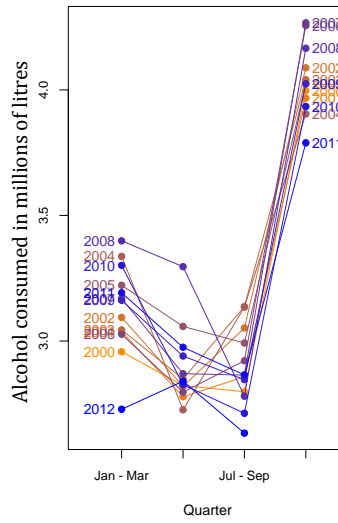


	Min NZ\$	Max NZ\$	Range NZ\$	Approx. Contribution
Raw Data	3	4.3	1.3	
Trend	3.1	3	0.1	7.69% (3sf)
Seasonal	-0.3	0.8	1.1	84.6% (3sf)
Residual	-0.1	0.2	0.3	23.1% (3sf)

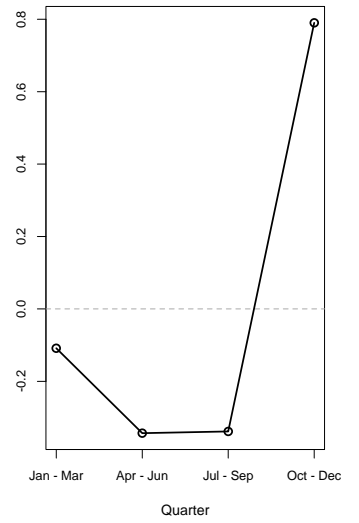
Recomposed data: TotalBeer



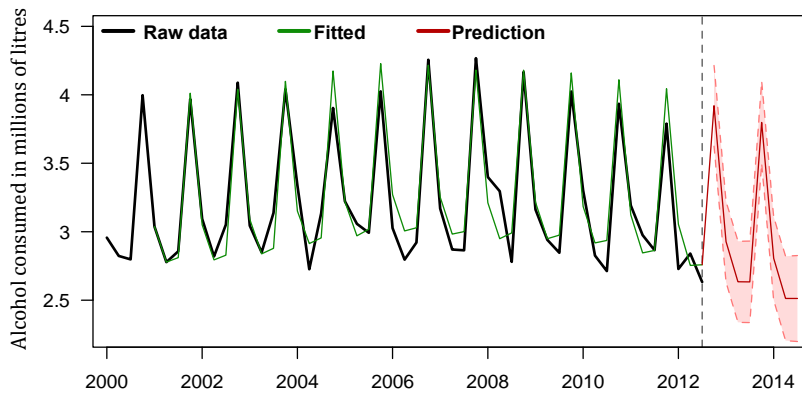
Seasonal plot for TotalBeer



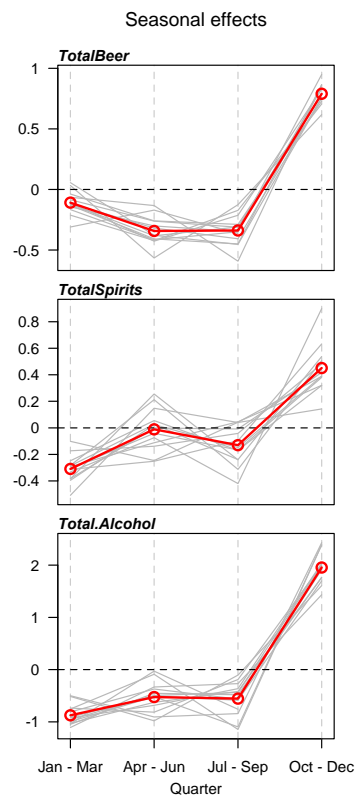
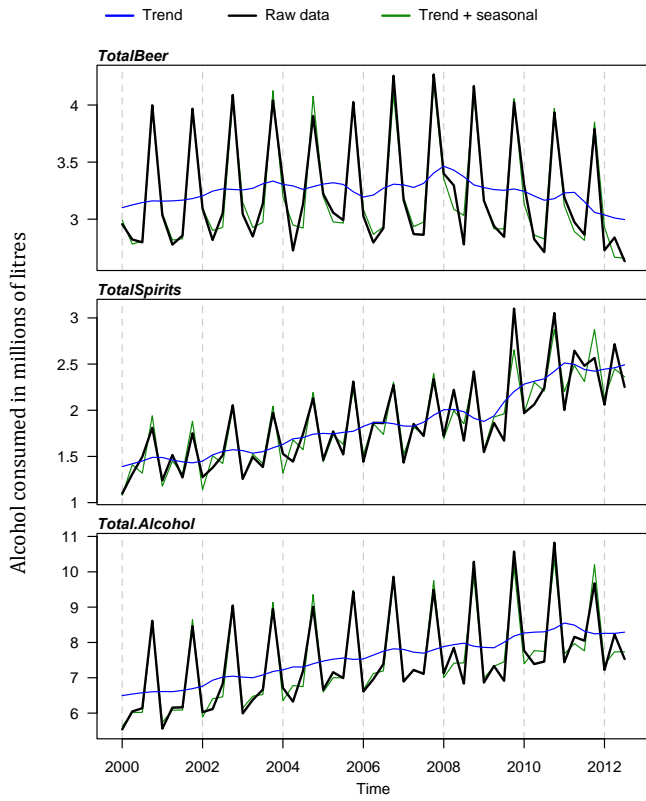
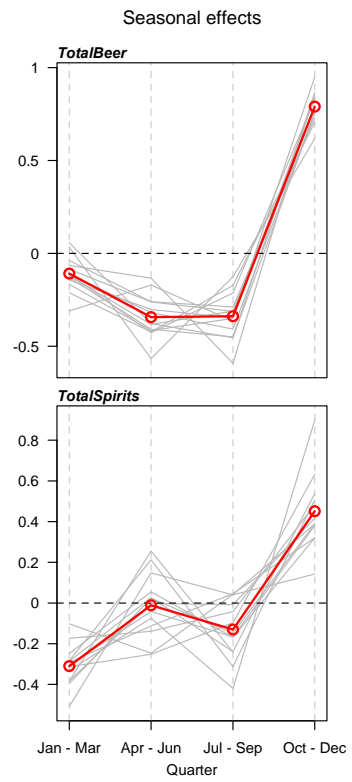
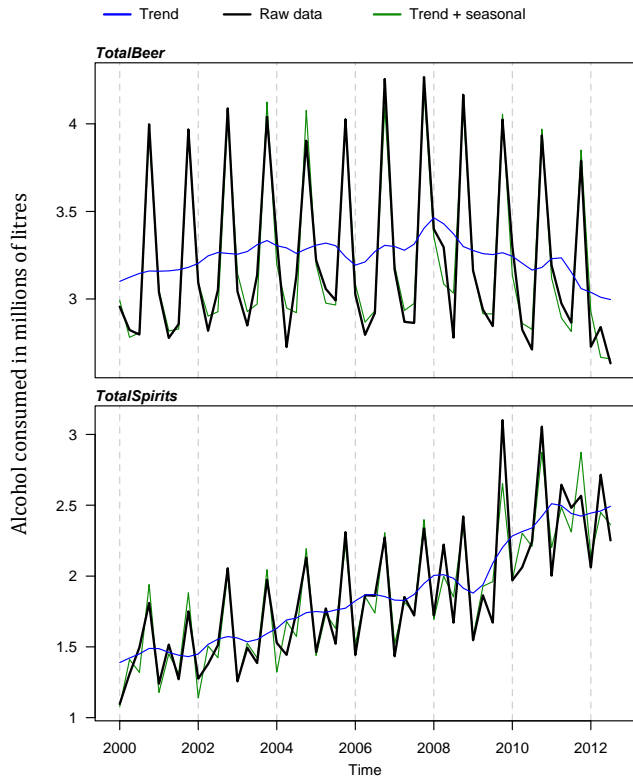
Estimated seasonal effects



Holt-Winters prediction for TotalBeer



Total Beer	Prediction	Lower limit	Upper limit	Range
2012 Q4	3.919951	3.62521	4.214693	0.589483
2013 Q1	2.927766	2.632638	3.222894	0.590256
2013 Q2	2.634705	2.338709	2.930701	0.591992
2013 Q3	2.634019	2.336487	2.931552	0.595065
2013 Q4	3.798208	3.498291	4.098126	0.599835
2014 Q1	2.806023	2.502703	3.109342	0.606639
2014 Q2	2.512962	2.205072	2.820851	0.615779
2014 Q3	2.512276	2.198518	2.826034	0.627516



Analysis:

Trend

Looking at the time series graph for Total Beer.

On average, the overall trend of the consumption of total Beer is decreasing. It is decreasing from about 3.1 millions of litres to 3 millions of litres of beer over twelve years. However, this is very small and looking at the data the total beer consumed increases until 2008 and then decreases until 2012. So the total beer consumed increases at a rate of about 0.0375 millions of litres of beer (from 2000 to 2008) and then decreases at a rate of about 0.1 millions of litres of beer until 2012. The increase on average until 2008 is probably caused by the increase in population over time as well as the increase in popularity with celebrating the New Year's period with drinking beer, as discussed in my research. However, the decrease after 2008 is probably caused by the recession. With less people in employment, they have less cash to spend on alcohol as well as less time to celebrate as they will be working hard to get more money.

There is a peak and then sudden drop at 2008 in which the consumption of beer drops from 3.4 millions of litres to about 3.3 millions of litres of beer. This sudden decrease will be caused by the recession that started in December 2007 and ended in June 2009. With as money being tight and people were struggling to find the cash, they would spend less on beer and more time finding jobs. Also alcohol consumption is patterned to rise and fall with economic crisis.⁸

There is also a peak in 2011 rising from 3 millions of litres to 3.3 millions of litres of beer consumed. This could be caused by the rugby World Cup that was held in New Zealand in 2011. As there were more people visiting New Zealand the amount of customers in restaurants and the amount of alcohol consumed increased.⁹ Thus, causing the increase in 2011.

Relative contribution – decomposed data

Looking at the Decomposition of the data, Total Beer graph I can see the relative contribution in the residuals to the raw data is about 23.1%. This decreases my confidence slightly as the residuals are quite big and could cause error in my predictions. Thus, my forecasts could be inaccurate due to the variation in residuals; however, they are not too big so it should not affect them too much.

Around 85% of the overall variation in the consumption of beer is due to the seasonal effect. This could be caused by the different months in the year. So the Oct-Dec quarter will be higher, due to the Christmas peak and people celebrating with their friends. Compared to the middle of the year, which has fewer events going on and hence, less people celebrating big with consuming beer.

The trend and residual components account for the remaining variation in the consumption of beer in New Zealand.

⁸ <http://ips.ac.nz/publications/files/09e5397d09d.pdf>

⁹ http://www.stats.govt.nz/browse_for_stats/economic_indicators/NationalAccounts/impact-of-rugby-world-cup.aspx

Seasonality

Looking at the individual seasonal effect graph for total beer consumed it shows the peaks and troughs in the decrease and increase in the consumption of beer over the course of the year. The year is split into quarters, so 3 months per quarter.

Looking at the average seasonal effect graph, in the Oct-Dec quarter it is the highest peak. This is because it is Christmas and lots of people in New Zealand celebrate Christmas with their friends drinking beer to have a good time, with Christmas dinner and sharing quality time with people. The Jan-Mar quarter is also a peak, though not as high as the Oct-Dec quarter. This is because of New Years celebrations and people drinking beer while watching the fireworks. But during Apr-Jun quarter and Jul-Sep quarter there is a trough as it is a middle of the year and people are just having their occasional drink of beer, as there are no big events on. However, the Apr-Jun quarter is the lowest trough but there is not much of statistical difference between the second and third quarter. The Apr-Jun quarter also is quite inconsistent with whether it is lower or similar drop to the Jul-Sep quarter. This gives me less confidence in predictions with the Apr-Jun quarter as the pattern in the individual seasonal graph is not consistent and may change in the future.

However, the Jan-Mar peak has not always been a peak as shown in the individual seasonal effects graph. But it is not that inconsistent and is a peak apart from 2012, which could reflect what happens in the future. Therefore it is not consistent so I will be less confident with my forecasts. New Years celebrations getting more popular and thus more people celebrating with drinking with their friends could cause this. Though we are becoming premium drinkers and drinking high quality brands of spirits and wine more so than beer as it has more alcohol content.¹⁰ However, compared to the Oct-Dec quarter it has always been a peak for people consuming more beer for Christmas celebrations. It is a time for everyone to indulge themselves. Therefore, I will be more confident with forecasts as it is consistent pattern compared to the Jan-Mar quarter.

Recomposed Data

Looking at the recomposed graph for total Beer. For the Jul-Sep quarter in 2008 the consumption of beer in millions of litres was less than expected as shown on the graph (trend + seasonal > raw data). This could be caused by the recession and the decrease in people consuming beer, as they are depressed from losing their job. This is because we are becoming premium drinkers and drinking high quality brands of spirits as it has more alcohol content.¹¹ So drink less beer and more other alcohol drinks instead.

For the Jul-Sep quarter, in 2011 the consumption of beer in millions of litres was more than expected as shown on the recomposed graph (trend + seasonal < raw data). This could be caused by the Rugby world Cup that was held in New Zealand

¹⁰ <http://www.stuff.co.nz/life-style/food-wine/5069833/We-re-becoming-premium-drinkers>

¹¹ <http://www.stuff.co.nz/life-style/food-wine/5069833/We-re-becoming-premium-drinkers>

during August. As there were more people visiting New Zealand so the amount of alcohol consumed increased as people got together to celebrate this big event.¹²

Forecasts

Looking at the Holt-Winter prediction graph for total beer consumed in millions of litres. In the last quarter, Oct-Dec in 2012 it should be about 3.92 (3sf) millions of litres of beer consumed. However, because it is a prediction I am not totally confident that this will be the exact value but it should be between the range of 3.63 (3sf) and 4.21 (3sf) millions of litres of beer consumed. The dark red line, which is the actual prediction, shows this as well as the light pink shaded area as the range of prediction on the Holt-Winters graph for total beer consumed.

In the Jul-Sep, the third quarter in 2013 the amount of beer consumed should be 2.63 millions of litres. But, again because it is a prediction I am not totally confident that it will be this exact value, but it should be in a range between 2.33 (3sf) and 2.93 (3sf) millions of litres of beer consumed.

However, the further away we get from the historical data the less confident I will get in my predictions.

Jan-Mar quarter 2013 – prediction range: 0.590 (3sf) millions of litres of beer
Jan-Mar quarter 2014 – prediction range: 0.607 (3sf) millions of litres of beer.
Therefore the bigger range for Jan-Mar quarter 2014 justifies my statement, so the amount of error in the forecasts will increase the further away we get from the historical data.

Also we will have different levels of confidence in predictions for different seasons (quarter of the year).

Oct-Dec 2013 (Q4) – prediction range: 0.589 (3sf) millions of litres of beer consumed
Jan-Mar 2014 (Q1) – prediction range: 0.590 (3sf) millions of litres of beer consumed.

I have slightly less confidence in making predicting for quarter 1 than quarter 4 as it has the bigger range. However, the range of millions of litres of beer is only about 0.001 millions of litres of beer, which is not that much difference, so I have similar confidence in making predictions for both of these quarters, as the ranges are similar. Also the range for Jan-Mar being higher could also be due to the fact that the further away you get from historical data the bigger the range gets as the less accurate it will become, but it is not that far from the historical data so I have more confidence in making predictions for Oct-Dec quarter as it is more constant than the Jan-Mar quarter as shown in the individual seasonal graphs.

¹² http://www.stats.govt.nz/browse_for_stats/economic_indicators/NationalAccounts/impact-of-rugby-world-cup.aspx

Comparing Variables:

Looking at the Total Beer consumed to the Total Spirits consumed trend and seasonal effect graphs, the overall trend for Total beer consumed is decreasing compared to the total spirits consumed in where the overall trend is increasing. However, saying that it is not a perfect linear trend and has some peaks and troughs in both graphs. So the total beer consumed increases at a rate of about 0.0375 millions of litres of beer (from 2000 to 2008) and then decreases at a rate of about 0.1 millions of litres of beer until 2012. This compared to the total Spirits consumed which is increasing at a rate about 0.0917 (3sf) millions of litres of spirits consumed from 2000 until 2012 at a relatively steady linear trend. It does have a big trough in 2008 where it is decreasing from 2 to 1.7 millions of litres of spirits consumed. This could be caused by the recession, which started at about December 2007 and ended in June 2009.¹³ The economy was falling; less people were employed and hence less people bought spirits so consumption went down, the same as beer.

However, after the period of the recession the total spirits consumed increased at a faster rate than before at about 0.2 millions of litres of spirits consumed from 2009 to 2012. This could be caused by the increase in teenagers in New Zealand drinking Alcopops, a new thing aimed at underage drinking. It mainly contains spirits and flavourings and juice in the beverages.¹⁴

Also the total spirits has another peak in 2011, rising from about 2.35 to about 2.5 millions of litres of spirits consumed. This also happened in the Total beer consumed, which also had a peak in 2011. This is due to The Rugby World Cup. This affected the amount of alcohol consumed as more people were here so the amount of customers in restaurants increased as well as the increase in alcohol consumption increased, as there was a big event to celebrate.¹⁵

There is also a trough in 2002 where the total spirits consumed decreased from 1.5 to 1.4 millions of litres. This could be caused by the decrease in consumption of alcohol from 2000 to 2003 after and increase prior. Advertising the effects of alcohol on a person caused the decrease.¹⁶ However, the overall trend for the total spirits consumed is increasing compared to the total beer, which is decreasing overall. This difference could be caused by the fact that our culture is become one of premium drinkers. We are drinking high quality brands of spirits as it has more alcohol content.¹⁷

Looking at the average seasonal effect graphs they look fairly similar. They both have a small peak for the Jan-Mar quarter when people are celebrating the New Years period and there are big events on over the summer. The Oct-Dec quarter for both beer and spirits is consistently a peak as it is the Christmas period and people celebrate together by dinking alcohol. However, the total spirits has also a peak in the Apr-Jun quarter, though there is a lot of inconsistency with this. This is also the same as beer, which also has a lot of inconsistency over the time period for this

¹³ When Did the Great Recession End? <http://usgovinfo.about.com/od/moneymatters/a/When-Did-The-Great-Recession-End.htm>

¹⁴ <http://en.wikipedia.org/wiki/Alcopop>

¹⁵ http://www.stats.govt.nz/browse_for_stats/economic_indicators/NationalAccounts/impact-of-rugby-world-cup.aspx

¹⁶ <http://www.parliament.nz/NR/rdonlyres/F1C84C49-7A9E-4F65-90DF-BEBDFCAE9BFD/488/0311Alcohol92.pdf>

¹⁷ <http://www.stuff.co.nz/life-style/food-wine/5069833/We-re-becoming-premium-drinkers>

quarter. Teenagers dinking Alcopops that mainly contains spirits with flavourings and juice in the beverages could cause this peak.¹⁸ Thus increasing the Apr-Jun peak for spirits compared to beer.

New Variable – Total Alcohol consumed

I am looking at the new variable graph comparing it to the total beer and total spirits consumed graphs. The Total alcohol consumed is calculated by adding the total beer, the total spirits and total wine together. This is because I want to see the impact that recession had on alcohol consumption and whether we are becoming a drinking culture.

Looking at the total alcohol consumed graph, the overall trend is increasing at a steady trend. It is increasing at a rate of about 0.167 (3sf) or 1/6 of millions of litres per year. This is caused by the increase in total spirits consumed, due to the recession causing people to want more premium drinks as they contain more alcohol content.¹⁹ As well as the increase in teenagers drinking Alcopops, which is mainly spirits or wine with flavourings added.²⁰ But it does have some peaks and troughs in the trend.

There is a peak in 2011, rising from 8.1 to 8.5 millions of litres of alcohol consumed. This caused by the same reason in the increase in the total beer and spirits consumed. It is The Rugby World Cup as it affected the amount of alcohol consumed as more people were here. Thus the increase in alcohol consumption, as there was a big event to celebrate.²¹

There is also a trough in 2008 where the total alcohol consumed decreased from 7.5 to 7.3 millions of litres. This is caused by the same reason for the decrease in beer and spirits. The recent recession, which caused more people to be unemployed and hence less people bought alcohol.

Looking at the average seasonal effect graphs for all the variables, the total alcohol consumed is in a similar pattern to the total beer consumed with a trough going through the middle half of the year. However, there is a slight peak in the Apr-Jun quarter, which is caused by the increase in total spirits consumed, due to teenagers drinking more Alcopops as well as New Zealand becoming a premium drinking culture and drinking drinks with more alcohol content. However, there is a peak in the Oct-Dec quarter for all the variables. This is due to the increase in big events of Christmas, so people consume more alcohol over this period.

However, the overall trend for the Total Alcohol consumed is increasing. Though after 2011, and the Rugby World Cup it seems to be levelling out. This could be caused by people drinking too much over that time period and now not drinking as much, as well as there not being many big events since. However, New Zealand is becoming more of a drinking culture and the recession has increased our intake of alcohol by making us want higher alcohol content in our drinks.

¹⁸ <http://en.wikipedia.org/wiki/Alcopop>

¹⁹ <http://www.stuff.co.nz/life-style/food-wine/5069833/We-re-becoming-premium-drinkers>

²⁰ <http://en.wikipedia.org/wiki/Alcopop>

²¹ http://www.stats.govt.nz/browse_for_stats/economic_indicators/NationalAccounts/impact-of-rugby-world-cup.aspx

Limitations:

With using time series graphs there are some limitations to the model. These are that when I am predicting / forecasting, the Holt-Winters time series only uses the actual values for the past five years or so to predict. This means that the past historical data does not influence the predictions and it is assuming that the consumption of alcohol will continue to increase at the same rate into the foreseeable future.

However, this could not be the cause. The time series model does not account for the changes in the economy effecting people's financial safety, or the next big event which could cause more people to drink more alcohol to celebrate. Also if some unforeseen event happens like a volcano erupts or a massive earthquake happens like in Christchurch in 2010²², this could decrease or increase the amount of alcohol consumed as people try to drink their stress or worries away than what was predicted.

Conclusion

So going back to the purpose of this investigation into alcohol consumption. How has the recession changed the amount of alcohol consumed in New Zealand. It has increased the amount of alcohol consumed but not by much overall. It has increased the total spirits and decreased the total beer consumed, thus the increase in total alcohol overall is not effected as much. But yes, our culture is becoming a drinking culture. And looking at the data Spirits is becoming increasingly more popular than beer now as it has more alcohol content to drink away people's stress and worry.

However, to predict what will happen in the future for the total alcohol consumed is not totally accurate the further away we get from the historical alcohol consumed data, but it should be in a range that we can predict. But is it subject to the economic changes, big social countywide events as well as natural disasters like and earthquake or volcanic eruption. Therefore, while the total beer is deceasing and the total spirits in rapidly increasing after the recent recession the overall trend for alcohol consumption in New Zealand is increasing. This is because the more stress we put ourselves under, the more we drink more to compensate and get rid of the worries.

²² http://en.wikipedia.org/wiki/2010_Canterbury_earthquake