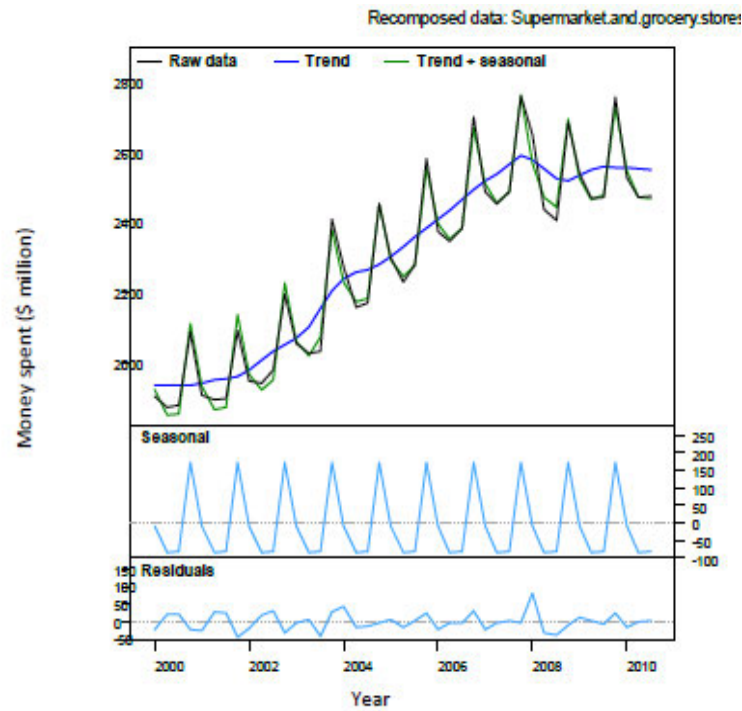


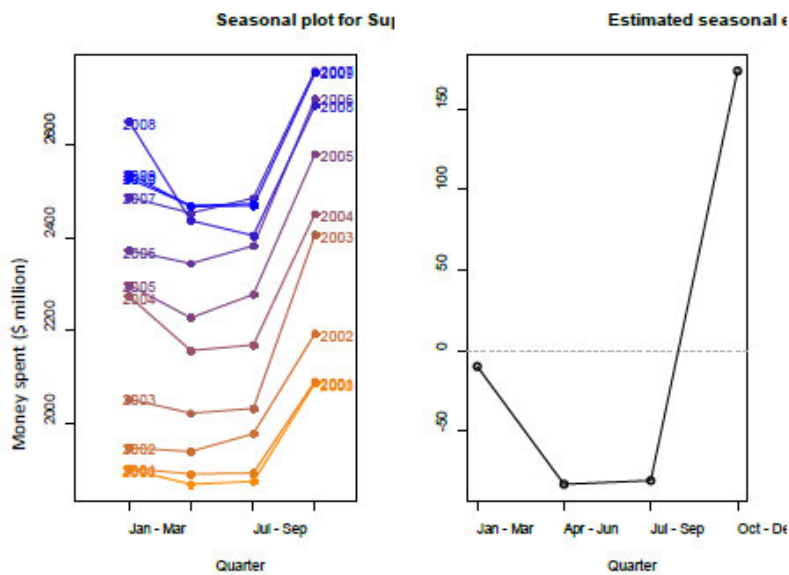
Maths Time Series Internal

My investigation is into NZ grocery and supermarket sales from 2000 to 2010. I am going to see if there are any trends over time and especially if there are any particular seasons when New Zealanders spend more or less at the supermarket. Research I have read from newspapers and from watching TV suggests that there seems to be more spending each year so my investigation may or may not verify this.

1

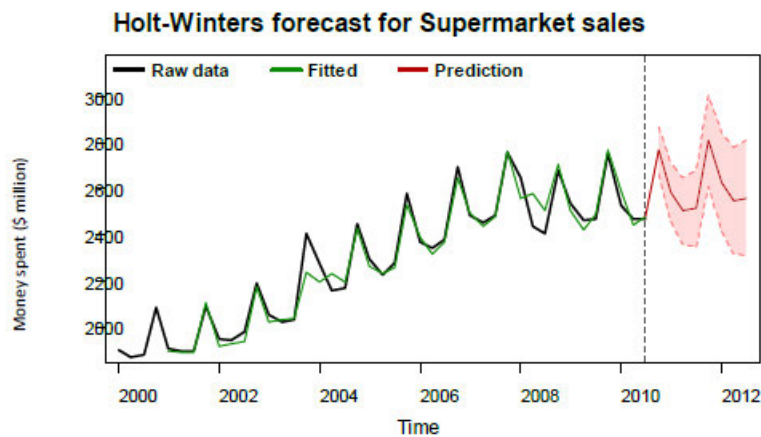


2



These graphs show that the average amount of money spent in NZ supermarket and grocery stores has an increasing trend with a slight decrease between 2008 and 2009. The trend starts from about \$1950 million in quarter 1 in 2000 with the trend then levelling off at around \$2500 million in quarter 3 in 2010. As the data gets to 2008, we see a slight decreasing ramp in the graph. This enables us to see that during this time something may have occurred and is why the amount of sales is slightly decreasing, or it may have just been a bad year. ③

The average estimated seasonal effects graph shows the seasonal pattern in the graph. Quarter four, Oct-Dec, has the highest peak as it is about \$170 million above the trend line showing that it is a particularly good part of the year with Christmas shopping etc while the other quarters 2 (Apr-Jun) and quarter 3 (Jul-Sep) are the lowest points as they are about \$80 million below the trend line. It is not surprising that quarter 4, which contains the Christmas shopping period, would be the quarter where the most money is spent. This is because people seem to spend more money on food and alcohol for events such as Christmas dinners, parties, end of year work shouts and of course heading into the New Year period.



Looking at the above graph which seems fairly accurate, the prediction for how many sales there will be in NZ supermarkets and grocery stores in quarter four of 2011 is between \$2600 and \$3000 million dollars. ④

This means that I was right when I thought that supermarket and grocery sales would continue to increase. ⑤