Ministry of Business, Innovation & Employment

Data Validation for the Regional Tourism Indicators

Contents

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Purpose

The Ministry of Business, Innovation and Employment (MBIE) has investigated the Regional Tourism Indicators (RTI) data to determine the validity of using this data to help answer questions about tourism expenditure at a regional level. For more detailed information about the RTI data, see 'About the RTI' section on the website.

Data validation compares the trends in the RTI with other tourism data sources to investigate the integrity of the data:

- Is the data valid, reliable, complete and accurate?
- Are there practical uses for the data?
- To what level of disaggregation can the data be used?
- What form can it take for industry to use?

Both the international and domestic RTI datasets have gone through a validation process. In this document, we highlight the differences between the RTI data and survey data, and identify the strengths and weaknesses of both.

Extent of data validation

The following are the key data validation checks were made on the RTI dataset:

1. Compare RTI expenditure data with expenditure data from the International Visitor Survey (IVS), Domestic Travel Survey (DTS) and Electronic Card Transactions (ECT). The ECT is from Statistics New Zealand; the two surveys are from MBIE.
2. Compare RTI expenditure data with volume data from the International Travel and Migration Survey (ITM) and the Accommodation Survey (CAM), both from Statistics New Zealand.
3. Explore relationships between the RTI dataset and other datasets (e.g. IVS, ITM) to measure the level of concordance between RTIs and other datasets and any irregularities in seasonally adjusted models. This gives us insight into whether patterns in the RTI data resemble those in other datasets (e.g. decline during recessionary periods).

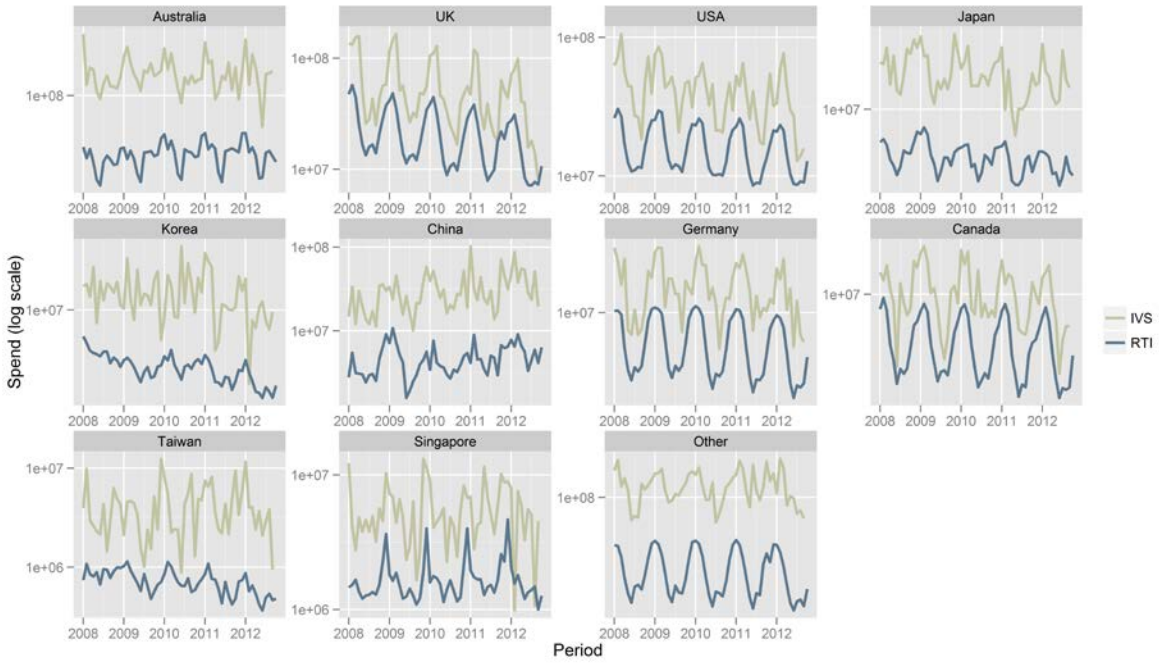
Key findings

International data

Trends in RTI expenditure follow a similar pattern to IVS expenditure trends

The figure below shows a comparison between IVS and RTI expenditure data since 2008. The scale is logarithmic so comparisons between the two datasets can be made more easily. Trends in the international RTI series match the IVS total expenditure trends well. For most countries the RTI data is smoother than the IVS survey data, suggesting greater reliability and validity (as it is more likely that the underlying real phenomenon is relatively smooth and regular like the RTI data than volatile like the survey data).

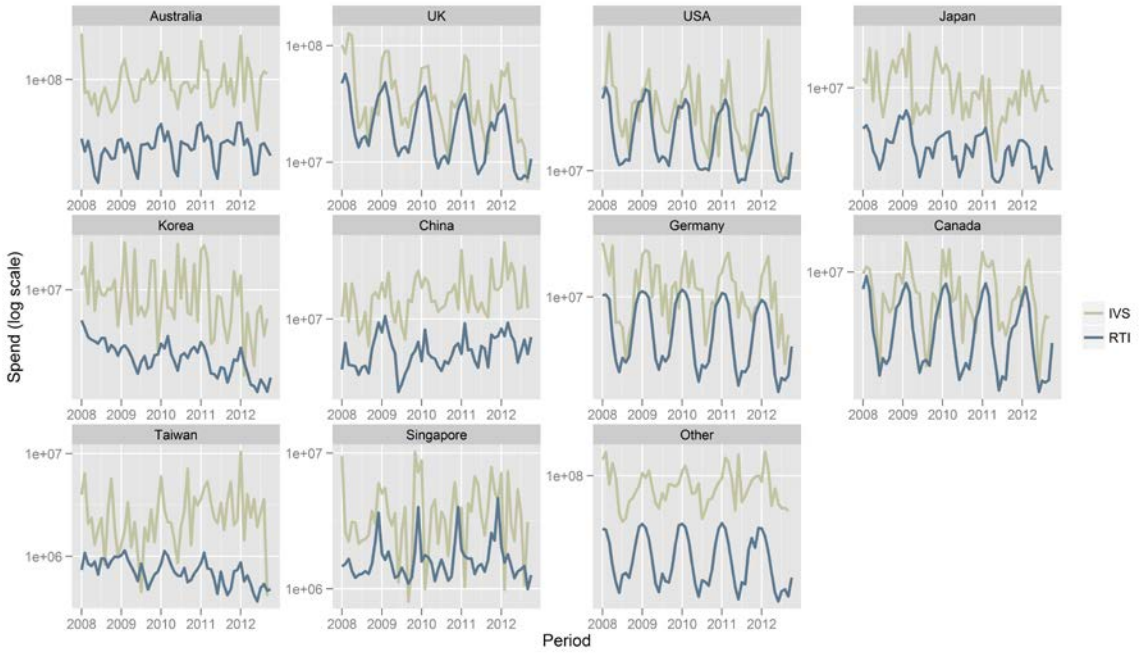
Figure 1: Comparison between IVS and RTI spend data, 2008-2012, by market



It is worth noting that countries with low sample sizes in the IVS (e.g. Korea, Taiwan and Singapore), have the most discrepancy between the IVS and RTI datasets, and will largely be due to survey error.

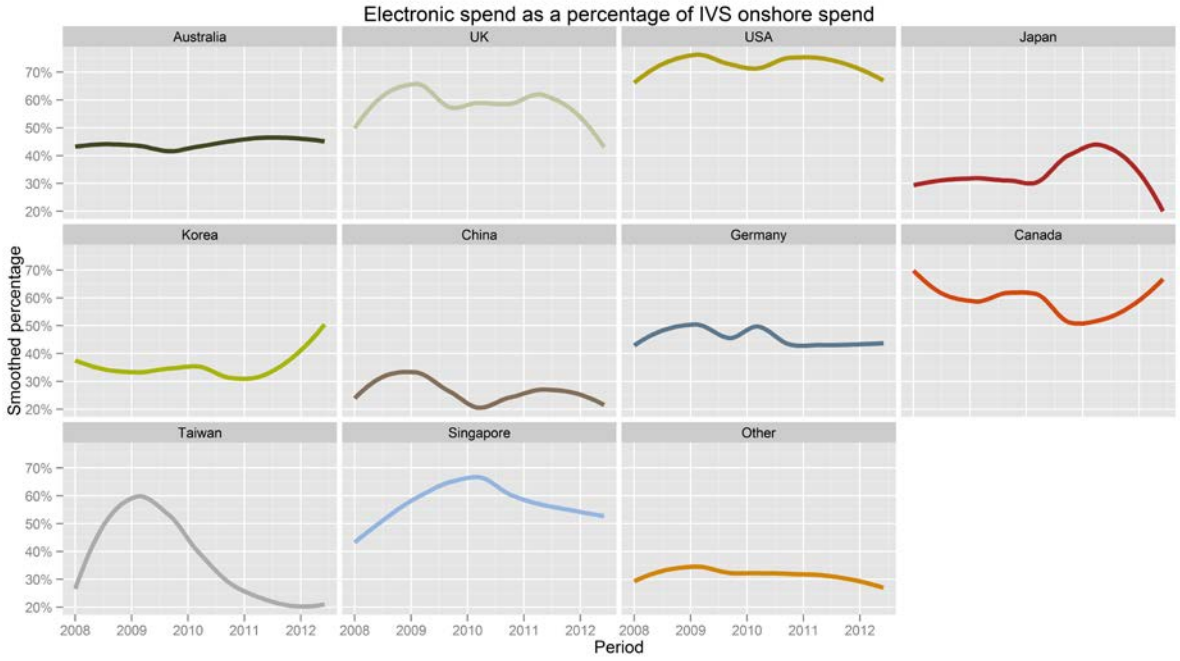
A more like-for-like comparison is between RTI expenditure and estimated IVS *onshore* expenditure (the IVS estimates both prepaid and onshore expenditure). As one would expect, the trends are even more closely matched in this comparison (Figure 2). There is a noticeable lag effect in the IVS data for countries with a propensity for long stays, for example, the UK, USA, Germany and Canada. The IVS assigns spend to the quarter that the visitor leaves the country.

Figure 2: Comparison between IVS onshore spend and RTI spend data, 2008-2012, by market



The difference in level between the RTI and IVS datasets show that the propensity of electronic card usage varies between visitor markets. For some markets, the magnitude of RTI and IVS onshore spending is very similar (e.g. UK, USA, Germany, and Canada), suggesting that much of these markets' onshore spend is via electronic means. This is demonstrated in Figure 3, which shows the ratio of IVS expenditure in New Zealand to RTI expenditure.

Figure 3: Electronic spend as a percentage of IVS onshore spend, 2008-2012



Note that for Australians, their RTI expenditure on average makes up only 40 percent of their total estimated onshore spend. There is no current explanation for this but suggestions include that they may purchase more via cash, or perhaps many Australian visitors have New Zealand bank accounts or credit cards they use whilst travelling here or they transfer the money to a friend or relative who gives them the money once they arrive.

Different visitor markets have different propensities of card use

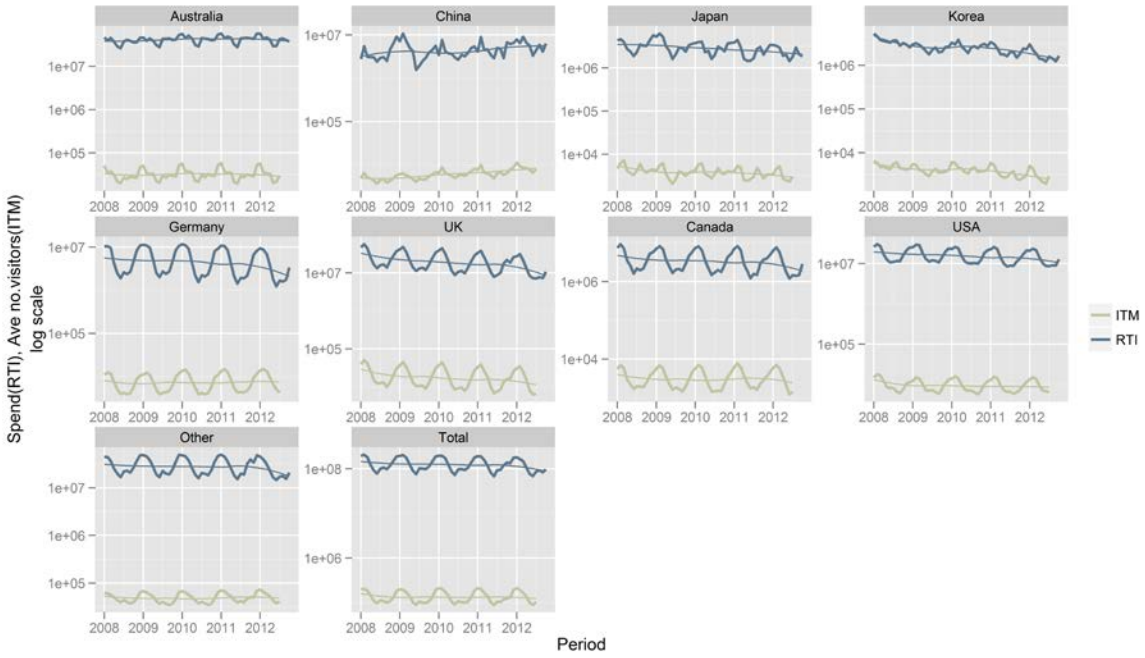
Care needs to be taken when interpreting the ratio data as a change in the ratio can be due to either a change in spending behaviour or a random chance in the IVS sample. For example comparing the Taiwan ratio (Figure 3) and the Taiwan plots (Figure 1&2) – the greater volatility of the IVS estimates suggests the increasing discrepancy is probably caused by random chance in the IVS, whereas if you looked just at the Taiwan panel in Figure 3 you might mistakenly conclude the RTI data has declined in quality.

China, Japan and Other have a low propensity of electronic card usage (about 30 percent), especially compared to countries such as Singapore and Canada at about 60 percent, or the USA at 70 percent. These observations match anecdotal evidence from the industry (for example that Chinese visitors pay for relatively large proportions of their total spend through cash or pre-payments rather than point of sale credit cards).

There are seasonal and market patterns in spending behaviour

Comparisons between RTI spend data and volume data (from the ITM) have also been carried out (Figure 4). There are large fluctuations for some markets.

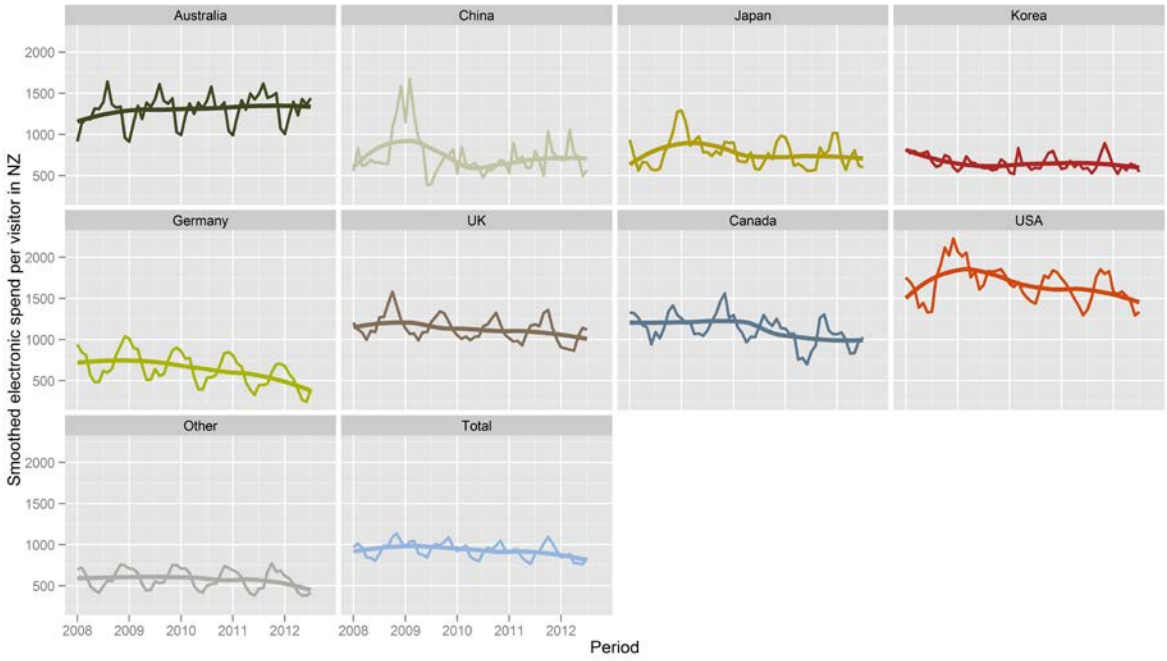
Figure 4: RTI spend against average numbers of visitors in New Zealand, 2008-2012, by market



Some interesting things to note are that spend per visitor has changed over time (both seasonal patterns as well as visitor market patterns) – see Figure 5. For example, Germans spend a lot more

over the Christmas period than they do at other times of the year. Conversely, visitors from the UK spend more around September/October.

Figure 5: Smoothed electronic spend per visitor in New Zealand, 2008-2012, by market



Electronic spend on accommodation services closely match international visitor nights

Figures 6 and 7 below show electronic spend (on accommodation services only) against the number of international visitor nights. The patterns closely match each other for most regions (there is an unusual drop in electronic expenditure on accommodation for Kapiti-Horowhenua RTO in mid-2009, where the number of nights did not drop.

Figure 6: RTI spend on accommodation services, and number of visitor nights from the CAM, 2008-2012

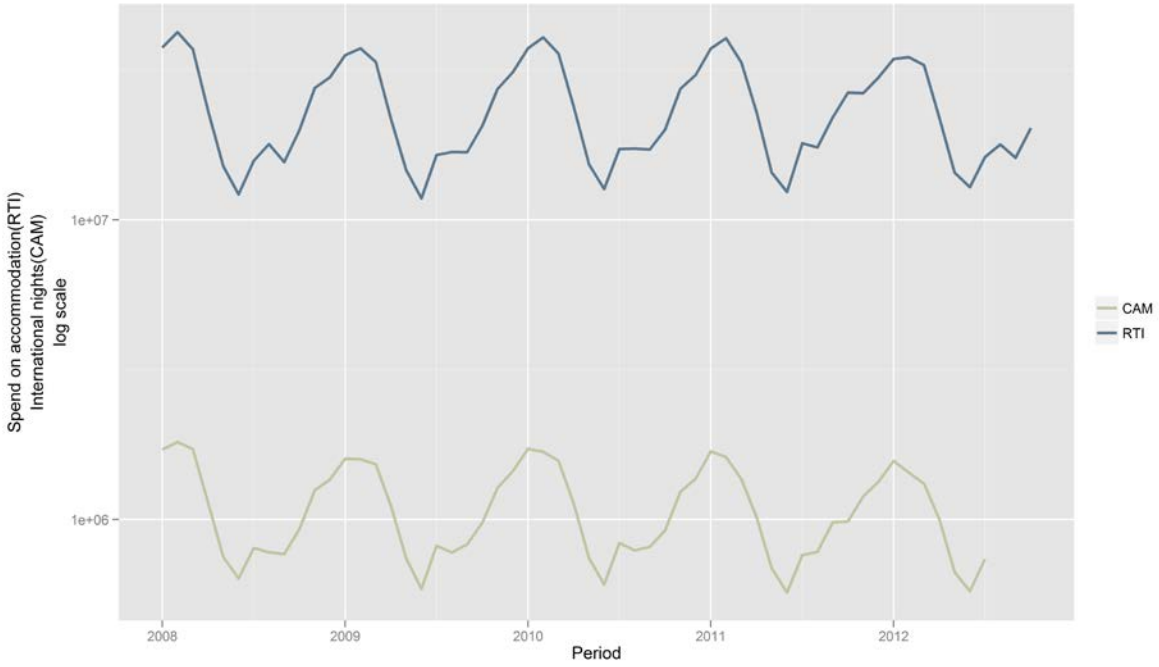


Figure 7: RTI spend on accommodation services, and the number of nights from the CAM at an RTO level, 2008-2012

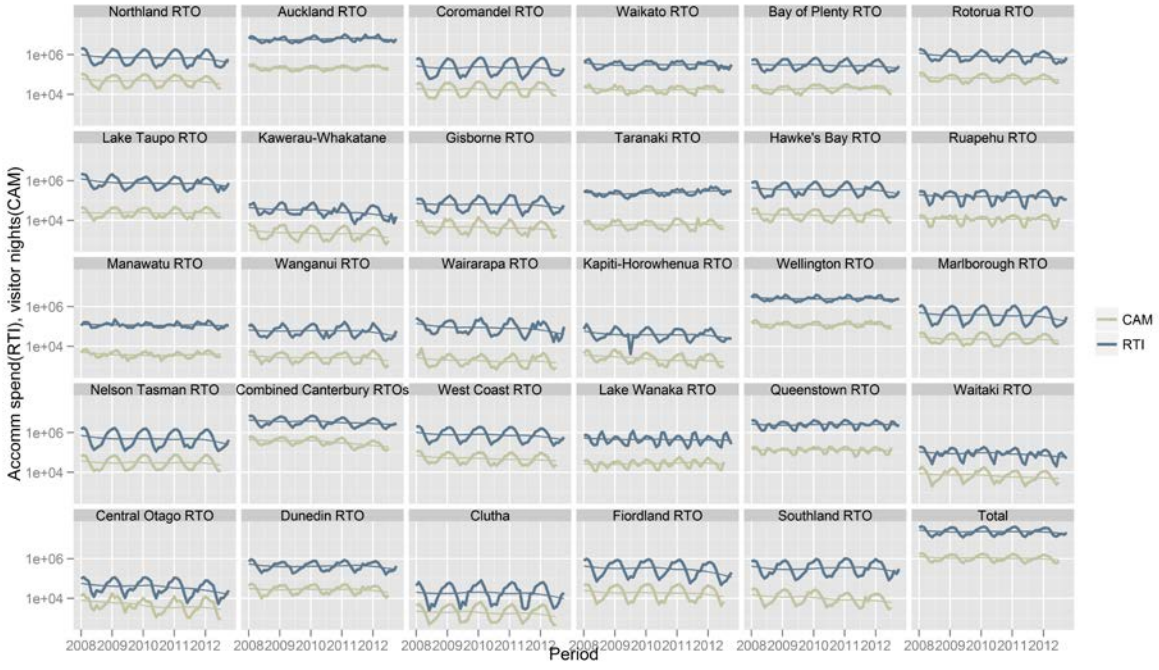
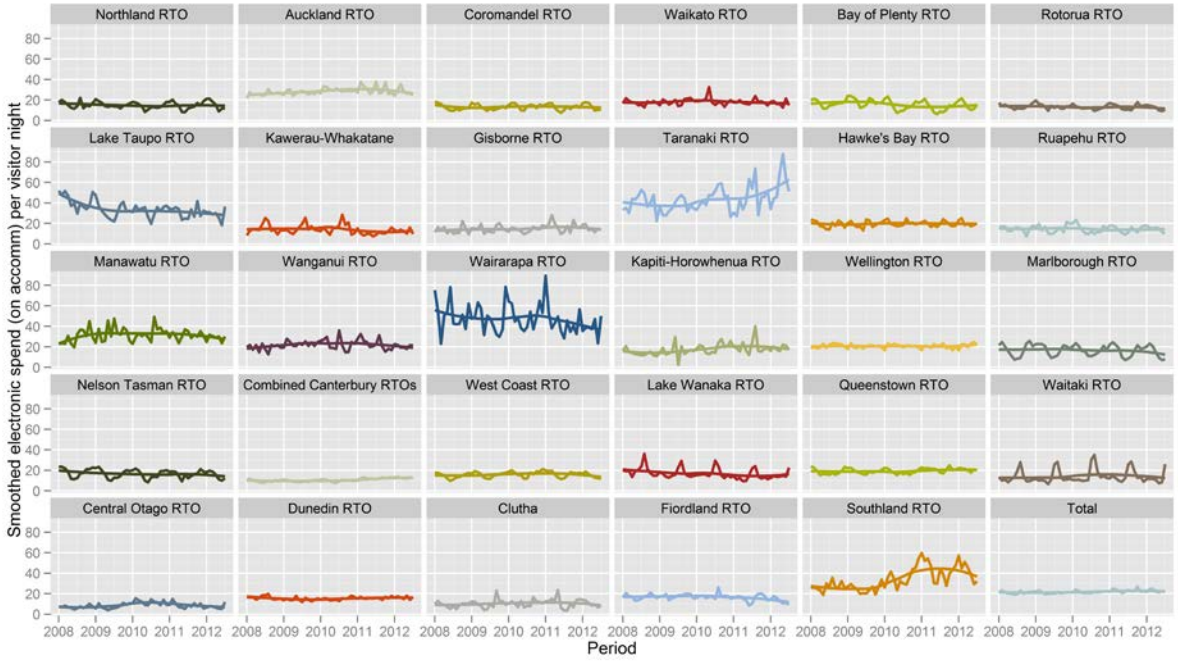


Figure 8 below shows the electronic spend on accommodation per night. As well as varying levels of spend per night in regions, there are some interesting fluctuations within some RTOs – for example,

Marlborough RTO shows a higher spend per night in summer than winter months. The trends since 2008 show how the level of spend per night is changing over time (e.g. increasing spend per night in Southland RTO since 2010).

Figure 8: Smoothed electronic spend on accommodation services, per visitor night, at an RTO level



Domestic data

RTI and DTS spend data closely match, except during 2008/09

The RTI and DTS expenditure data follow roughly similar patterns (Figure 9 and 10), except during the 2008/09 period (Figure 11 & 12), where the RTIs show more of a decline than the DTS expenditure.

Figure 9: Comparison of RTI spend (by month) and DTS spend (by quarter), since 2008

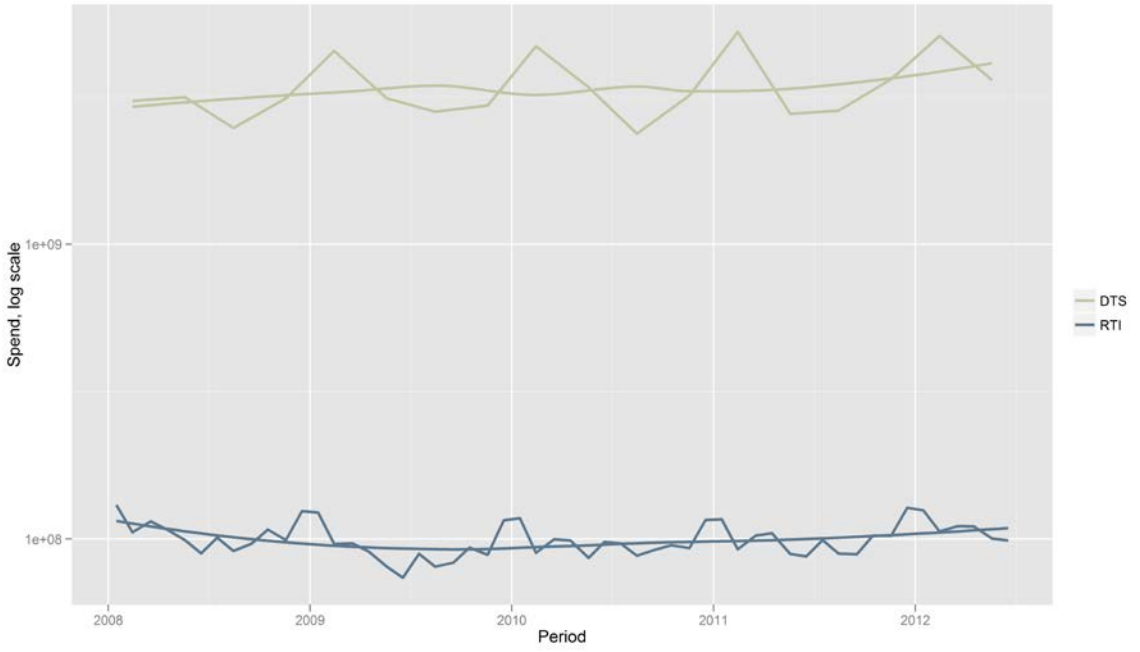
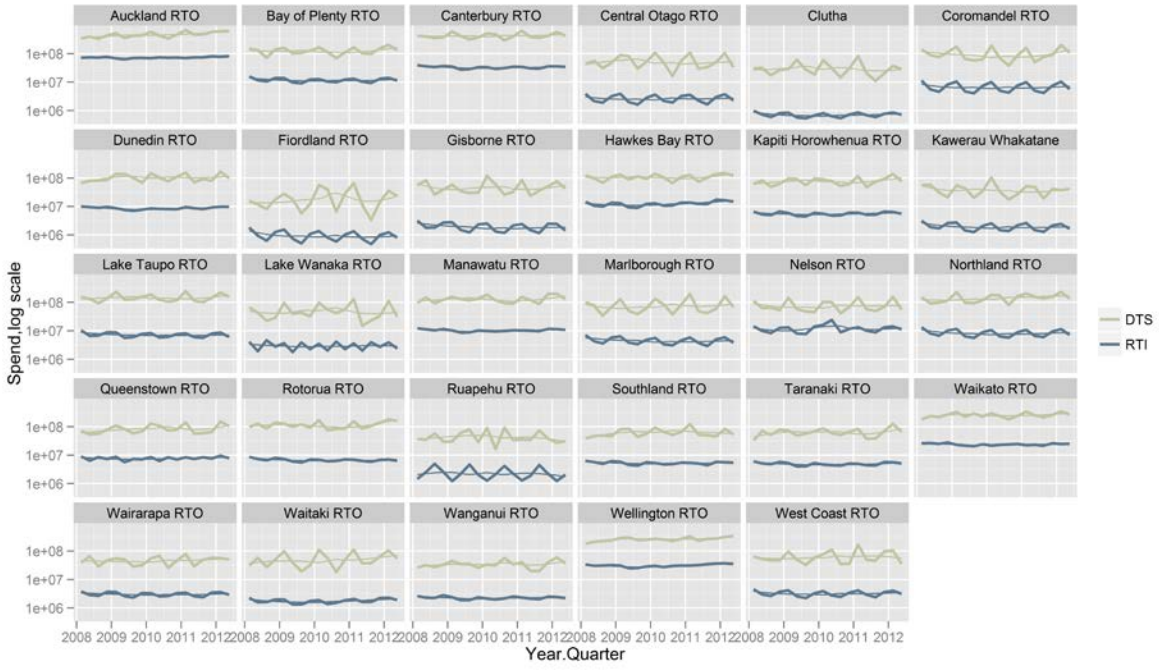


Figure 10: Comparison of RTI spend (by month) and DTS spend (by quarter), by RTO, since 2008



The figures below show the trend components of the RTI (Figure 11) and DTS (Figure 12) expenditure, using the time series technique known as classical seasonal decomposition by moving averages, with a multiplicative seasonal component. This seasonal adjustment picks out a declining trend in expenditure in the RTI data during 2008 and 2009 whereas the DTS data shows an increase in this period. Two possible reasons for this could be a) the significant methodological changes that took place for the DTS during this time, and/or b) the RTI data appears to pick up recession impact (i.e. drop in expenditure) around 2008/09 whereas the DTS data does not.

Figure 11: Observed, trend, seasonal and irregular components of the RTI series, 2008-2012 (using classical seasonal decomposition)

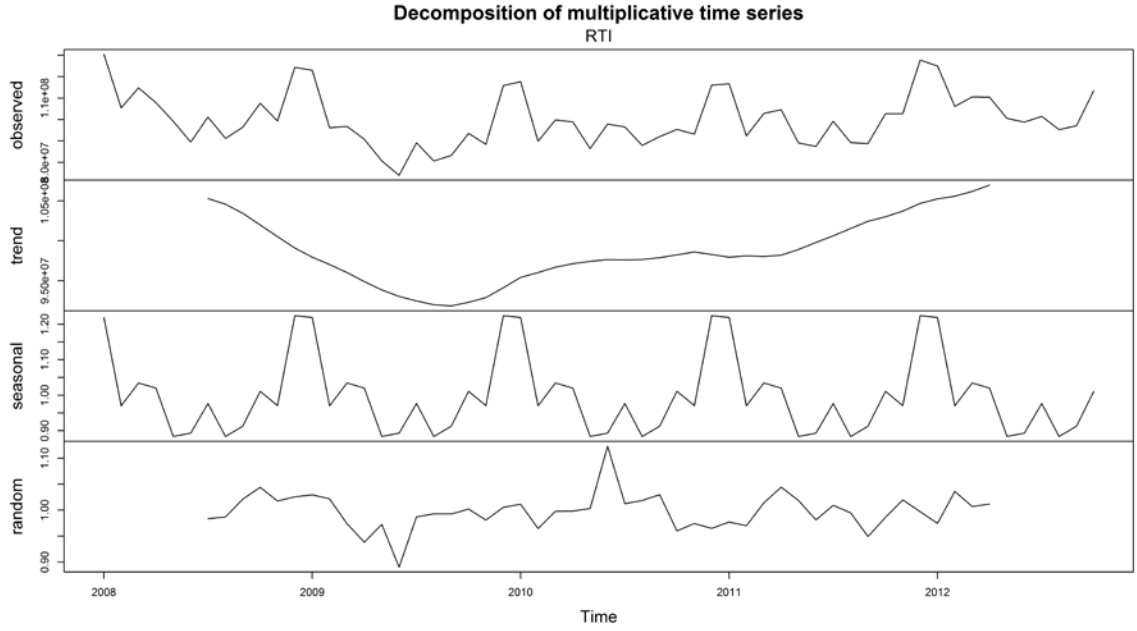


Figure 12: Observed, trend, seasonal and irregular components of the DTS series, 2007-2012 (using classical seasonal decomposition)

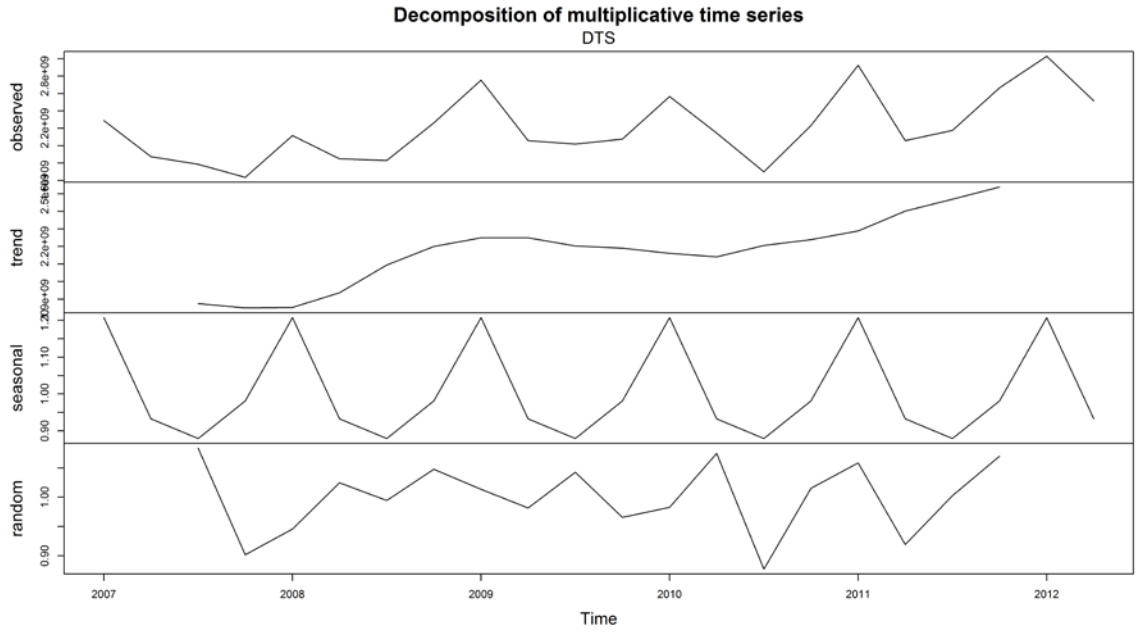
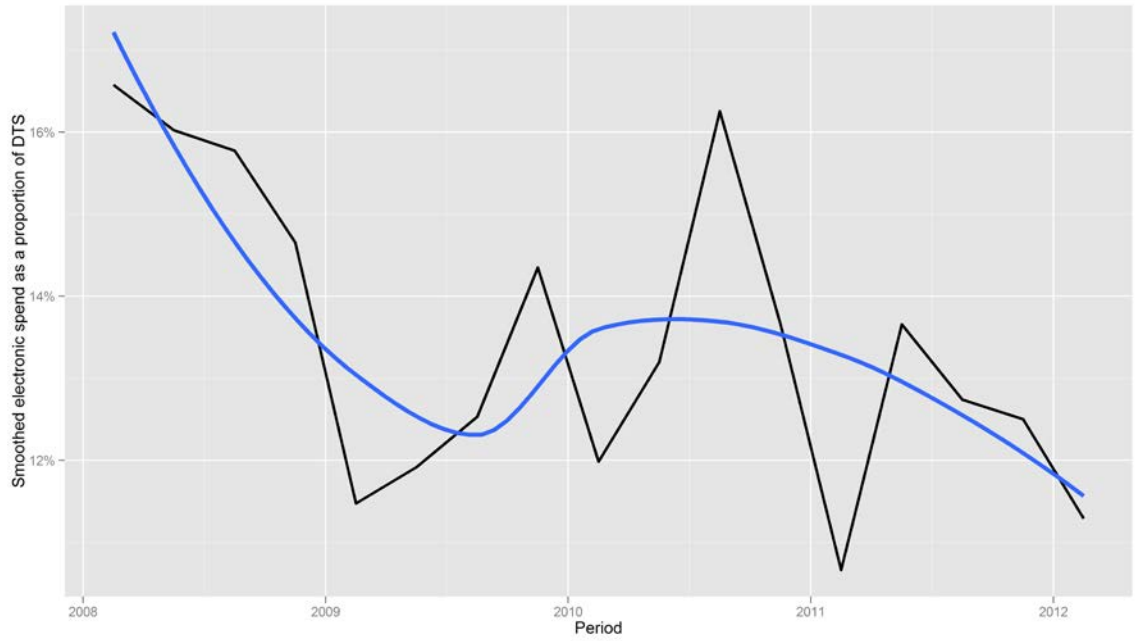


Figure 13 below shows the RTI total spend as a proportion of DTS total spend. Since 2009 the RTI represents about 13 percent of the total domestic expenditure reported in the DTS.

Domestic RTI spend represents a much lower percentage of total domestic spend than is the case with the international RTI data, which represents around 20-70 percent of total international spend (depending on visitor market) – Figure 3 above (although in both cases the sample is much greater than the 0.2 to 0.4 percent of the population that it is possible to sample is a survey). However, spend behaviour is more representative within a country such as New Zealand, than between different nationalities, and therefore we are confident the RTI domestic series is broadly representative in its characteristics of total domestic expenditure.

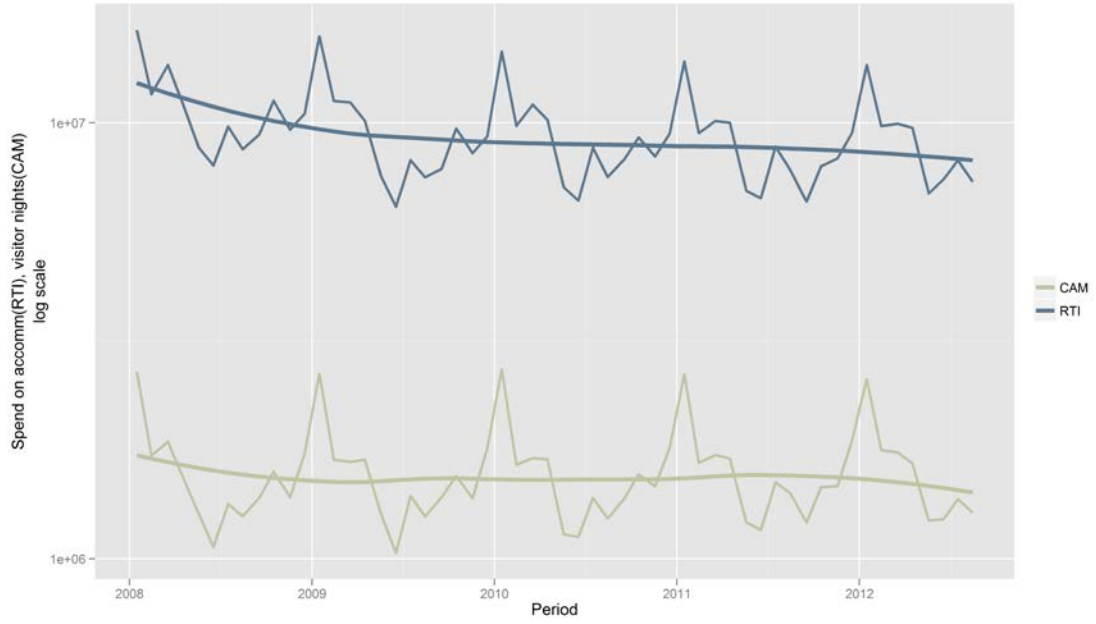
Figure 13: Electronic spend as a proportion of DTS spend, 2008-2012



Electronic spend on accommodation services and domestic visitor nights follow similar trends over time

Electronic spend on accommodation and the number of visitor nights follow similar patterns (Figure 14)

Figure 14: Comparison of RTI spend (on accommodation only) and CAM domestic visitor nights, by month, since 2008



Spend on accommodation per night is declining over time

Overall, electronic spend on accommodation per night is declining over time (Figure 15). At this point in time, we do not know if this represents a real decline in expenditure or whether it is just the result of changes in payment behaviour, for example, via increased bookings and payments via the internet (which will not be picked up in RTI data). This trend will need to be monitored against other sources.

Figure 15: Electronic spend on accommodation services per visitor night, 2008-2012

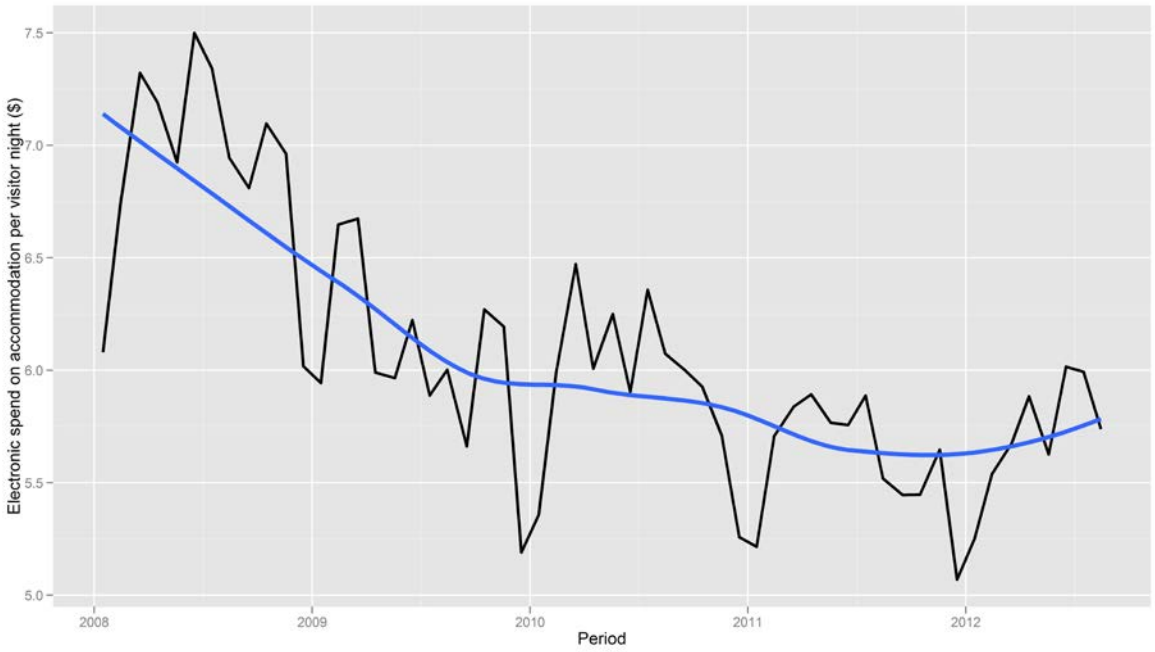
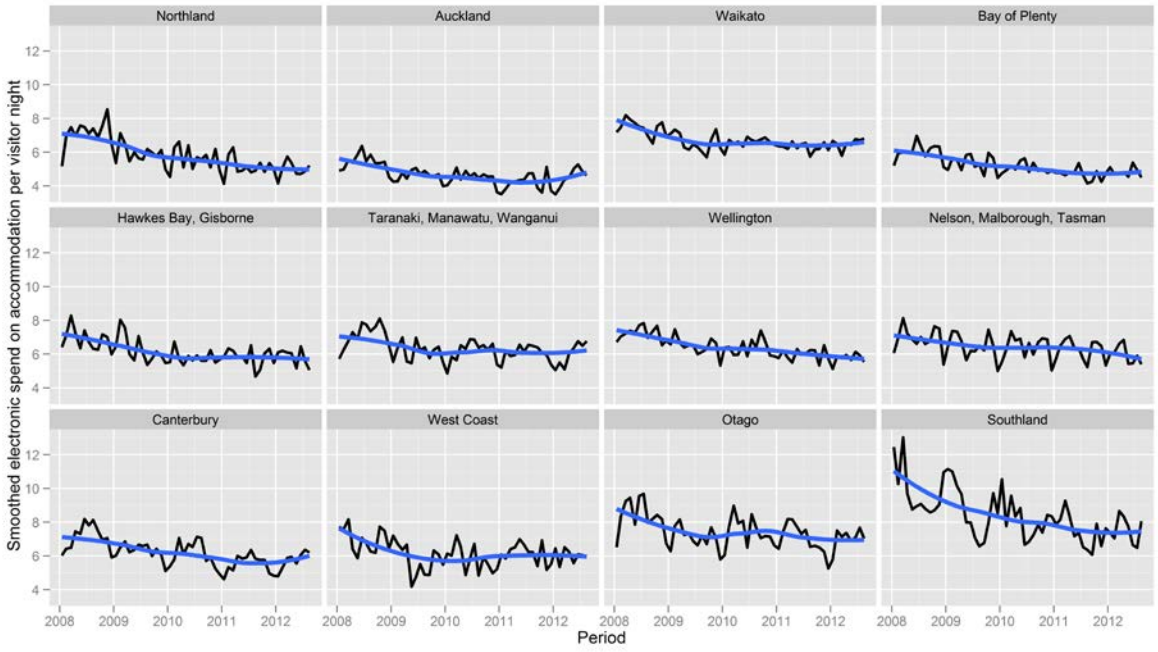


Figure 16 below shows that there are varying fluctuations in electronic spend per night within regions. However, most regions are experiencing a drop in spend per night over time (as with the national picture in Figure 15 above). Again, one must caution here that spend is only 'card present' spend, so any increase in, say, online bookings for this sector will not be taken into account.

Figure 16: Electronic spend on accommodation per visitor night, by region, 2008-2012



Other findings from data validation (both international and domestic data)

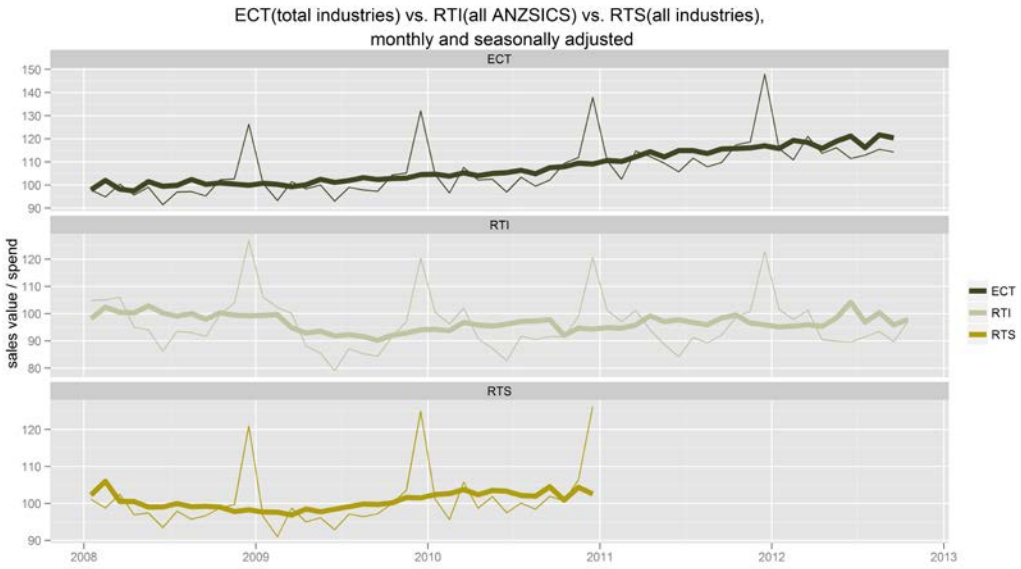
Lag effects in survey data

The survey data has marked lag effects, especially over the Christmas period (i.e. measuring the activity later than it actually occurred). RTI data is more timely as it monitors the spend activity in real time, whereas survey data collects data at point of interview (and casts back). A visible example of this is in Figure 2 for Germany and the United Kingdom.

Comparisons of RTI with Electronic Card Transactions (ECT)

ECT data from Statistics New Zealand shows a steady increase in value since 2008, however the RTI shows a decline in the 2008/09 years, as does Statistics New Zealand's Retail Trade Survey (RTS) – see figure 17. This difference is likely to be due to the combinations of purchases that are being picked up in the different series.

Figure 17: RTI trend over time compared with Statistics New Zealand's ECT and RTS series, since 2008



Conclusion

In conclusion, the RTIs in their current state can be used with confidence to measure *change over time* in expenditure activity; and origin-based market share (eg what proportion of UK spending goes to each region). MBIE is satisfied with their overall reliability and validity. For reporting on ANZSIC or regional disaggregation they are far superior to survey methods, and discrepancies between the RTIs and the surveys are nearly all explained by random chance in survey sampling. In other words, for the purpose they were designed for, the RTIs are far superior to the IVS and the DTS.

However, the RTIs by themselves cannot provide actual spend figures, as they only represent a proportion of total spend (as they monitor electronic transactions only). Tourism survey data, i.e. the IVS and DTS, is designed to estimate aggregate spend figures (by visitor market in the case of international data), and the current Regional Estimates methodology applies these figures across regions. In 2013, the method for calculating the Regional Estimates will be revised to include the latest RTI data so it will then be possible to estimate total spend data for the RTIs. Further improvements to comparing spend across sectors may be possible by incorporating analysis from the Tourism Satellite Account; this will also be explored in 2013.

Finally, the key vulnerability of the RTIs is to consumers' changing payment behaviour over time. This might present challenges to using the RTIs to show long term strategic change (eg over 10 years, once the series has been available for that long). Using the RTIs for comparisons in relatively short time frames of a few years is less likely to problematic in this sense.

The two key concerns are changing general behaviour by a particular market segment (eg residents of a market country start using credit cards more than they used to); or industry-specific change by all customers (eg a certain industry moves more to online payment). It is possible that the decline in accommodation spend per night shown when comparing the RTIs to the CAM is an early example of

the second problem. The problem of changing markets can be monitored by comparing RTI figures to the IVS as is done in Figure 3. The problem of changing payment behaviour in a particular industry will have to be monitored by comparing RTI data to a complex range of other data sources. MBIE will monitor both these challenges.

The table below outlines typical areas where different data sources might be used:

Query	**Data to use**
I want a total measure of spend in my region by international / domestic visitors	Regional Estimates, annual In 2013, the method for calculating the Regional Estimates will be revised to include the latest RTI data.
I want to see how spend has changed over time in my region	RTI
I want to see how much different visitor markets spend in total in my region	Regional Estimates, annual. In 2013, the method for calculating the Regional Estimates will be revised to include the latest RTI data.
I want to see the proportion of spend in my region from key markets (both domestic and international)	This is not currently available as it requires combining RTI and IVS data. It is planned for this work to be done by mid-2013.
I want to compare the level of international visitor spend in my region compared to other regions	With the RTIs, you cannot compare levels of spend *between* visitor markets because each visitor market has very different spend characteristics and/or penetration of card usage (e.g. Asian markets use electronics cards less than European markets).
I want to see how spend from different visitor markets has changed over time, for my region or for all of New Zealand	RTI
I want to see what visitors to my region spend their money on (ANZSIC sectors) – proportion	RTI (to be released in 2013)
I want to see what visitors to my region spend their money on (ANZSIC sectors) – amount	Currently the IVS or DTS give a breakdown of spend by type at a national level, but *not* ANZSIC sectors. A combination of IVS/DTS, TSA and RTIs in 2013 or later might provide a reliable answer to this question.

Data sources used

In the preparation of this document the following data sources have been used

1. International Visitors Survey (IVS) –Ministry of Business, Innovation and Employment. http://www.med.govt.nz/sectors-industries/tourism/tourism-research-data/international-visitor-survey

2. International Travel and Migration (ITM) –Statistics New Zealand http://www.stats.govt.nz/browse_for_stats/population/Migration.aspx also known as the International Visitor Arrivals (IVA) http://www.med.govt.nz/sectors-industries/tourism/tourism-research-data/international-travel

3. Accommodations Survey –Statistics New Zealand http://www.stats.govt.nz/browse_for_stats/industry_sectors/accommodation.aspx also known as the Commercial Accommodation Monitor (CAM) http://www.med.govt.nz/sectors-industries/tourism/tourism-research-data/commercial-accommodation-monitor-data

4. Domestic Travel Survey (DTS) –Ministry of Business, Innovation and Employment http://www.med.govt.nz/sectors-industries/tourism/tourism-research-data/domestic-tourism

5. Electronic Card Transactions (ECT) –Statistics New Zealand http://www.stats.govt.nz/browse_for_stats/industry_sectors/RetailTrade.aspx

6. Retail Trade Survey (RTS) –Statistics New Zealand http://www.stats.govt.nz/browse_for_stats/industry_sectors/RetailTrade.aspx

7. Regional Estimates - Ministry of Business, Innovation and Employment http://www.med.govt.nz/sectors-industries/tourism/tourism-research-data/other-research-and-reports/regional-data