

North Shore Growth Index – An Explanation of the Model

The following information provides details of the methodology, variables used, data and overall outcomes from the North Shore Economic Growth Index.

Methodology

A mathematical (multiple linear regression) model has been constructed for the Auckland Region, in which the Gross Regional Product (GRP, proxied by National Bank's regional growth index) is used as the dependent variable (or target variable).

This regional growth model using quarterly data has then been converted to show economic growth on a monthly basis. The model has then been modified to assess growth at the North Shore City level.

Variables

The data used to further refine the model has been chosen based on the following principles:

- The data is measurable;
- The data has clear economic (i.e. theoretical) explanations and also has a relatively high (i.e. empirical or statistical) correlation with local economic growth;
- The data is relatively easy to access and update.

Based on those parameters, the following factors have been used as robust variables (i.e. explainable) in the growth index model:

- Explained (or target) Variable
 - DGI --- District Growth Index
- Explainable Variables
 - Bld-No --- Number of building permits issued for new dwellings
 - Retail --- Retail sales
 - Exp(-1) --- Exports with 1 lag behind
 - Car-No --- Number of car registrations
 - Houses --- Number of houses sold
 - Unemp --- Number of people unemployed
 - Visitors --- Number of short term international visitor arrivals
 - Rates --- 90-day bill rates

All of the variables are measured by the annual average percentage change, except for the unemployment and 90 day bill rates. Since these two variables are stock rather than flow variables, the unemployment rate is the annual percentage change, while the bill rate is the average actual 90-day bill rate over the month.

Data Sources and Results

Data sources are provided by Statistics NZ (SNZ), Real Estate Institute of NZ (REINZ), Land Transport Safety Authority (LTSA), Reserve Bank of NZ (RBNZ), and the former NZ Employment Service Centre (formerly NZESC now WINZ).

The supply of the unemployment data has been a major challenge. NZESC stopped providing monthly data in July 1998, while information published by WINZ normally lags six to eight months behind. APR obtains information from HLFS (i.e. the quarterly Household Labour Force Survey results provided by SNZ), and undertakes an extrapolation to estimate the monthly unemployment data.

By incorporating both economic theory and econometric techniques (the statistical software Minitab is used to find the best fitted results), we construct the growth index to provide a robust model of economic growth for North Shore City. However, because of the limitations in the data, in terms of time span, the model is updated on a regular basis. That is, the reliability of the model is tested to ensure its statistical reliability on a regular basis. Related to this is that the longer the length of the time the model has been operating and the data has been collected and reviewed, the greater the reliability of the model.

In addition to North Shore City, APR currently produces district, city and regional economic growth models in South Canterbury, Canterbury, Taupo, Rotorua, Western Bay of Plenty, Hawkes Bay and Gisborne. These are also constantly updated and reviewed based on other regional models (e.g. National Bank of NZ).

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