Student Booklet

Te whai hua - kia ora!



Economic Data, Issues and Analysis

sorted themes Savings, KiwiSaver, Retirement



2

CREDITS

4

AS91226 (version 2)

Economic Theory and Practice

Analyse statistical data relating to two contemporary economic issues

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Nau mai haere mai!

Welcome to the Economic Data, Issues and Analysis module.

Please read through the Student Guide for an overview of the module and assessment before starting this Student Booklet.



1

Topic One: Processing and presenting statistical data

Learning outcome for Topic One

✓ Understand how to process and present statistical data to show trends

Success criteria

- I can calculate summations, means (averages), percentages and percentage changes
- I can identify a trend
- I can extrapolate data to make predictions.



This topic focuses on reviewing common mathematical skills that are used in economic statistical analysis.

It uses the contexts of climate change and inequality because these are significant, long term economic issues that New Zealand is facing.

When economists look for pathways for the economy, they first look for evidence to see if problems, patterns and connections exist. Much of the evidence they use is statistical data because it has the potential to show change over time. Economists are interested in how guickly things are changing as this helps to identify how quick the response may need to be and what resources might be needed to correct an issue.



Data processing skills

Assessment tip: 👰



For this standard it is important that you can accurately process statistical data, which means that you are able to perform mathematical calculations correctly.

You also need to be able to identify a trend, and this means that (at the least) you can look at a spread of data and place a line that approximates where the data is heading.

Further into the assessment task you will also need to extrapolate the data - you will need to predict where the data will go in the future.

The expectation of the standard is that you can calculate summations, means (averages), percentages, and percentage changes.

Calculating Percentages

In economics the consideration of the significance of a category to an overall total is a common tool for comparison. This can be best seen when using percentages.

To calculate a percentage, use the following formula:

Percentage of category to the total =
$$\frac{category \ amount}{total \ amount} \times 100$$

Consider this example related to retirement savings [1], which is based on 25-yearolds who earn the average wage for their gender, and contribute three percent of their income to KiwiSaver plus their employer's contribution of three percent:

A 25-year-old female will, on average, reach 65 years of age with contributions to their KiwiSaver fund of \$141,000. A 25-year-old male will, on average, reach 65 years of age with contributions to their KiwiSaver fund of \$220,000.

The contributions of the average female are what percentage of the average male contributions? KIWISAVER

<u>141,000</u> x 100 = 64.1%

Calculating Percentage changes

Economic statistics also tend to be time-series data. This enables us to make comparisons across years. Therefore, it is common to make comparisons of percentage changes.

To calculate a percentage change, use the following formula:



Consider the following data related to KiwiSaver contributors [2].

The number of contributing members to KiwiSaver funds in New Zealand increased from 1,881,150 in 2021 to 1,938,233 in 2022.

What is that as a percentage increase?

 $\frac{1,938,233 - 1,881,150}{1,881,150} \times 100 = 3.03\%$

Complete Topic 1 Activities 1–2 in the Student Practice Booklet

Presenting percentage data

Assessment tip: 👰



Here is a simple strategy for successfully drawing a percentage bar graph: draw a rectangle 100mm high and 20mm across so that each millimetre up represents 1 percent.

For example, the table below provides data [4] relating to the percentage of people who are employed and earn less than 120% of the adult minimum wage. This is used as an indicator of the working poor.

Trends in low pay							
	Proportion of employed people (%)						
	2006	2009	2012	2015			
Percentage of employed	17.9	24.0	23.9	24.9			
people who earn less than 120% of the adult minimum wage	(287,600)	(396,600)	(401,200)	(463,000)			



Percentage of employed people earning less than 120% of the Adult Minimum Wage

The percentage bar graphs perhaps give a better sense of increasing inequality, but the line graph does make it potentially easier to identify an upwards trend.

Presenting percentage change data

When presenting percentage change data across several time periods it is common to use a line graph. Percentage changes are on the vertical axis while years (time) is along the horizontal axis. If there are any negative percentage changes then the vertical axis will need to extend below zero.

For example, the following table presents data [5] relating to New Zealand's net greenhouse gas emissions. Greenhouse gas emissions are a significant cause of climate change. Tracking greenhouse gas emissions over time provides valuable information to help reduce climate change.

Year	Net Emissions CO ₂ equivalent (kt)	Percentage Change %					
2012	52,539.63	-					
2013	52,218.75	-0.61					
2014	52,788.79	+1.09					
2015	52,640.78	-0.28					
2016	50.844.74	-3.41					
2017	54,027.34	+6.26					
2018	54,689.52	+1.23					
2019	56,068.10	+2.52					
2020	54,088.62	-3.53					
2021	55,746.42	+3.06					

New Zealand Greenhouse Gas Emissions 2012-2021





Identifying trends

Assessment tip: 👰

To meet the achievement requirements of the standard you need to visually identify a trend and place a trend line onto your graph.

There is no need to do a mathematical calculation to identify a specific line that fits the best. If the line looks reasonable then that will meet the standard. Here are examples to show you what is acceptable and what is not.



New Zealand Greenhouse Gas Emissions 2012-2021

Lines A and E would probably not be accepted as showing the trend in the percentage change in CO_2 emissions. Whereas lines B, C and D probably would be assessed as showing the appropriate trend.





2

Topic Two: Explaining trends in statistical data

Learning outcome for Topic Two

Understand how to provide detailed explanations of relationships in statistical data using economic concepts and/or models

Success criteria

- I can use a range of economic concepts and/or models to explain statistical data
- I can identify a trend and give a detailed reason for it
- I can provide economically sound and logical explanations.

This topic focuses on developing paragraph writing skills: the ability to write paragraphs that connect issues and economic models using relevant concepts, terms and economic theory.

After economists have gathered statistical data and processed it to show trends, they endeavour to communicate the significance of the trends to economic issues. It is important to explain how data is connected to economic issues, and what changes in data indicate about changes in economic issues. Economists use economic models to help communicate simplified explanations. By focusing on key relationships it is possible to create understanding of what makes the largest impact.

Using Economic Concepts and Models

When identifying suitable economic concepts, you need to consider finding economic language to support ideas related to people making decisions. Any list provided here would only be a very small sample of acceptable economic concepts. You may need to consult with your teacher about the suitability of the economic language and concepts that you intend to use.

Complete Topic 2 Activity 1 in the Student Practice Booklet



Here are some acceptable economic models to use:



You may need extra learning based around these models to gain success in this standard.

Writing an Explanation

To write an explanation of a trend the best first step is to **identify the trend or relationship**. Use terms like increasing, rising, growing, decreasing, falling, shrinking, constant, stable and perhaps the rate at which this occurs – quickly, rapidly, slowly, or steadily.



Assessment tip: 🍟

Just identifying the trend will not be enough. The minimum for Achieved is to explain the relationship that the trend reflects. For you to **explain the trend**, you will need to **identify** the trend, provide **specific data evidence**, and give a **reason** for it.



Assessment tip: 🍟

The step up to Achieved with Merit is to provide a **detailed explanation**. That usually means that you provide multiple reasons, or you provide greater detail to the explanation of your reason(s).



Here is an example of the full expectation of the relationship between interest rates and wealth inequality.

After processing and presenting the data a trend has been identified.



New Zealand's Wholesale Interest Rate (Official Cash Rate) 2019-2023 [6]

DATA SOURCE: TRADINGECONOMICS.COM | RESERVE BANK OF NEW ZEALAND

One explanation of the trend and its impact on the economic issue (inequality), using economic models and/or concepts, could be as follows.

Over the period from 2019 to 2022, wholesale interest rates in New Zealand have risen from 1.75% to 5.50%. This is due to persistent levels of high inflation sitting outside the target of 1-3% in the medium term. High inflation has been caused by increased global uncertainty, for example due to the post-Covid 19 pandemic recovery and conflict in the Ukraine. There have also been supply chain issues and increased costs of imported raw materials which are then passed on to households in the form of higher prices for goods and services. Higher interest rates seek to reduce demand by increasing the cost of borrowing and return on savings. Unfortunately this can see a movement of wealth away from households on lower or fixed incomes who do not own assets that generate income (Eg. minimum wage earners or beneficiaries). They have less economic power than higher income households, with less discretionary income to manage their way through the increased costs of living. They are less able to increase savings in order to take advantage of higher interest returns. Many of these households may also have higher levels of consumer debt and will therefore struggle to service their loans due to increased interest costs. This means that they are less able to build their own wealth. In contrast, however, those households on higher incomes will likely have more discretionary income available, with a greater capacity to save. Some of these households will own existing properties with manageable levels of debt and will be more able to endure periods of high interest rates. Therefore the rise in interest rates can result in an increase in wealth inequality.

This answer is not the only possible answer. There are multiple different correct answers to this situation.

Assessment tip: 💇



To achieve the standard, ensure that your answer is economically sound and logical.

Complete Topic 2 Activity 3 in the Student Practice Booklet





Topic Three: Explaining the interrelationships between climate change and inequality

Learning outcome for Topic Three

✓ Understand how to provide detailed explanations of inter-relationships between statistical data using economic concepts and/or models.

Success criteria

• I can use the example provided to help me write a detailed, economically sound and logical explanation



This topic focuses on developing understanding of the interconnectedness of economic issues.

Our economic world is a very complex place. Some parts are clear and easy to understand, while other parts have complex and seemingly invisible connections. Changes made in one area can have distant, unexpected consequences.

Much like a bridge over a river, made from thousands of individual parts, all relying on each other, damage to one part can create stresses in other areas that are some distance away. Those stresses can lead to further weaknesses and ultimately a failure of the bridge. An economist needs to identify and explain the weaknesses, and the stresses on other parts of the economy that those weaknesses create, and predict what those weaknesses and stresses will do to the economy.

The recognised link between Climate Change and Inequality

In 2017 the United Nations released a working paper by Nazrul Islam and John Winkel titled Climate Change and Social Inequality [7]. The paper aimed to explore how the impact of climate change was related to social inequality.

The paper noted:

Climate change is negatively impacting prices, assets, productivity, and opportunities. Each of these impacts on the ability of people to move out of poverty. Low income households are disproportionately affected by climate change. Therefore, as the effects of climate change intensify it is likely that economic inequality will increase.





Three effects of inequality on disadvantaged groups

Based on Figure 1, pg 5, 'Climate Change and Social Inequality'.

The increased exposure and loss from climate change are also a result of increased reliance on consumption and production that increases climate change. For example, low-income jobs are often in industries that are high polluting and low-income households often own older vehicles that are less efficient and have greater carbon emissions.



Reinforced vicious cycle between inequality and climate change

Based on Figure 7, pg 9, 'Climate Change and Social Inequality'.

In addition to this, the disproportionate influence that politically and economically wealthy groups have in society further increases the vulnerability of disadvantaged groups and therefore intensifies the inequality of negative impacts of climate change.

Economic and Political transmission channels of the effects of inequality on disadvantaged groups



Based on Figure 8, pg 10, 'Climate Change and Social Inequality'.



Before moving on to Topic Four, check that you understand:

How to write a detailed, economically sound and logical explanation for inter-relationships between statistical data using economic concepts and/or models.





Topic Four: Making a justified forecast

Learning outcome for Topic Four

✓ Understand how to provide a justified forecast for one contemporary economic issue by using extrapolated statistical data.

Success criteria

- I can extrapolate data to provide a forecast
- I can justify my forecast using sound economic reasoning.

This topic focuses on predicting likely outcomes based on knowledge of history and changes in human behaviour.

Are humans destined to continue on the same path, with the same attitudes, beliefs and behaviours, or will humans adapt their behaviour, and learn from what was done well and what was not done well?

Making predictions is not difficult. Justifying the predictions is significantly harder. Ultimately, your prediction can only be judged as correct or incorrect in hindsight. The quality of your justification, on the other hand, can be judged and therefore that is the most important part of this topic.



Making a forecast

This requires you to extend the graphs you have drawn by adding a prediction of the direction in which the graph might head.

Here are some forecasting suggestions:



Use past data. If the last two years have shown increases, it might be fair to assume that next year will show an increase.



Use related data. If greater borrowing results in greater risk to lenders and therefore higher interest rates, then a decrease in borrowing could lead to lower interest rates.



Use knowledge, experience, and history. History tells us that our economy tends to operate in cycles. After a rise there usually comes a fall and after a fall usually comes a rise. An example of this is what economists refer to as the business cycle.

The justification is the reasoning behind the forecast and can be based on the forecasting suggestions above.

Using the graph from topic one, for example:



New Zealand Greenhouse Gas Emissions 2013-2021

The data could be predicted to decline slowly as shown by line **A**. The justification for this could be that from 2017 to 2021, there has been a downward trend in the percentage increases in CO₂ emissions. Economics could be included by stating that government and societal changes have resulted in previous production methods that added to carbon emissions being replaced by more environmentally friendly methods of production. Examples include the Zero Carbon Amendment Act 2019 and recent Climate Reduction Targets for 2025 & 2030 required from large NZ firms. Consumers have moved their preferences towards goods and services that are produced using environmentally friendly methods and producers have responded to this shift in demand.

Assessment tip: 🍟

Your response is judged on the soundness of your economic reasoning not on the accuracy of your prediction. Complete Topic 4 Activities 1–2 in the Student Practice Booklet

Before moving on to your assessment, check that you understand:

- How to extrapolate data to provide a forecast
- How to justify your forecast using sound economic reasoning.

References

- 1) <u>https://www.stuff.co.nz/business/89957960/women-face-retirement</u> <u>-savings-battle</u>
- 2) https://www.fma.govt.nz/assets/Reports/KiwiSaver-Annual-Report-2022.pdf
- 3) <u>https://www.ird.govt.nz/about-us/tax-statistics/kiwisaver/datasets</u>
- 4) https://www.mbie.govt.nz/assets/c92012e10c/low-pay-in-nz-january-2018.pdf
- 4) <u>https://www.stuff.co.nz/national/education/118854795/student-loan-arrest-debt-at-crisis-level</u>
- 5) <u>https://environment.govt.nz/publications/new-zealands-greenhouse-gas-inventory-1990-2021/</u>
- 6) https://tradingeconomics.com/new-zealand/interest-rate
- 7) https://www.un.org/esa/desa/papers/2017/wp152_2017.pdf