Valuation of the Student Loans Scheme

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Agenda

1. The valuation
2. Projecting repayments
3. Student loan model
4. Modelling techniques
5. Challenges
6. Results
7. Cohort analyses
8. Impact of GFC on students

The valuation

- The Crown lends money to students

- Inland Revenue (IR) collects the repayments

- The loans are assets in the Crown's accounts

- The Crown must report the value of these loans when preparing its financial statements

- Hence, a valuation of these loans is needed

- Future repayments are projected and discounted to determine their value

Projecting repayments

- Annual repayment obligations:
  - If living in New Zealand:

$$\text{Obligation} = 12\% \times \max(0, \text{Income} - \$19,084)$$

  - If living overseas:

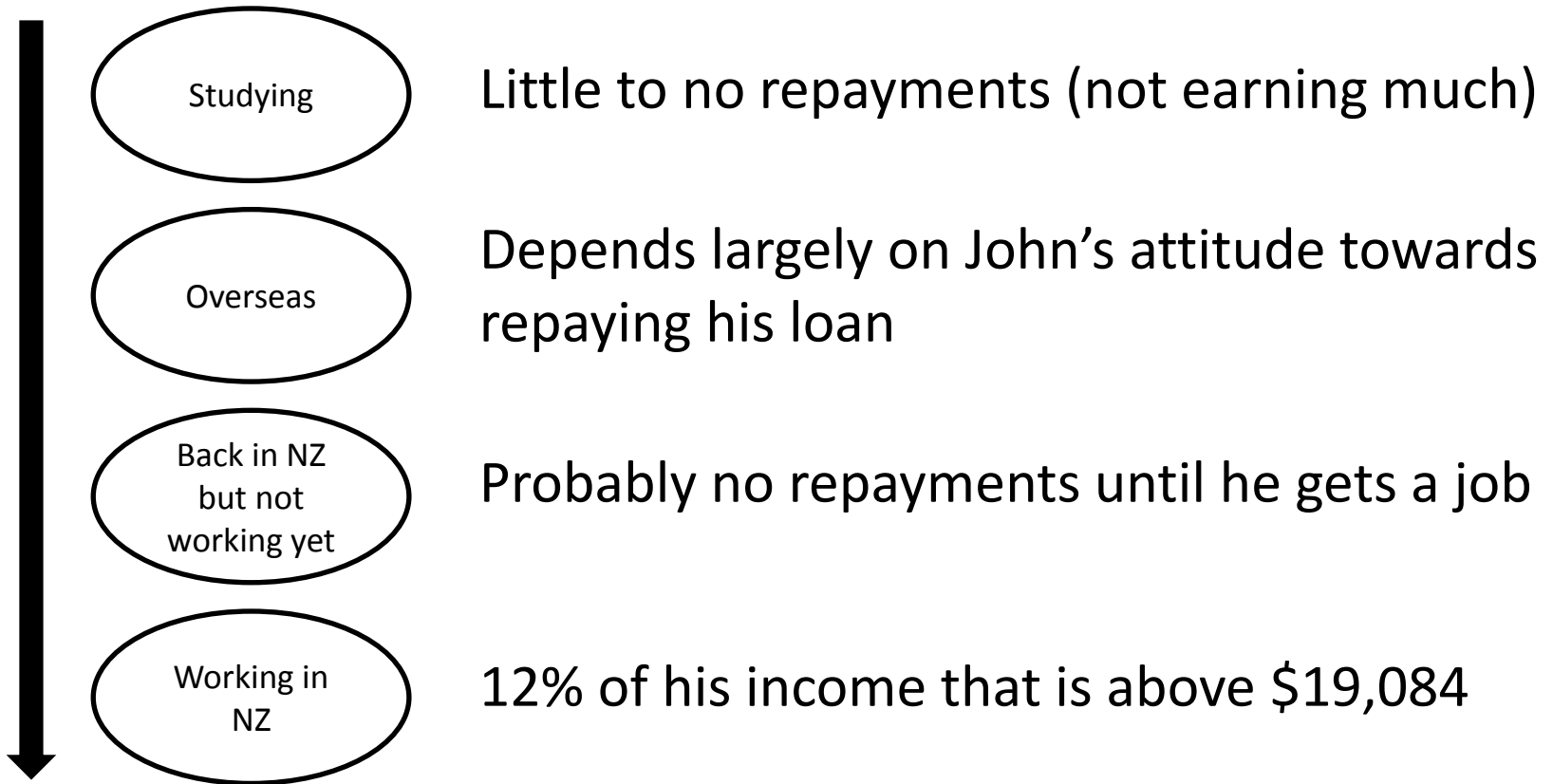| Outstanding balance	Repayment obligation
< $1,000	Outstanding balance
$1,000 - $15,000	$1,000
$15,000 - $30,000	$2,000
$30,000 - $45,000	$3,000
$45,000 - $60,000	$4,000
$60,000+	$5,000

Projecting repayments

- Consider a typical student:
  - John Smith starts uni aged 18
  - Works part-time while studying
  - Completes his degree in 3 years
  - Goes overseas for 1 year (OE)
  - Comes back home
  - Gets a job
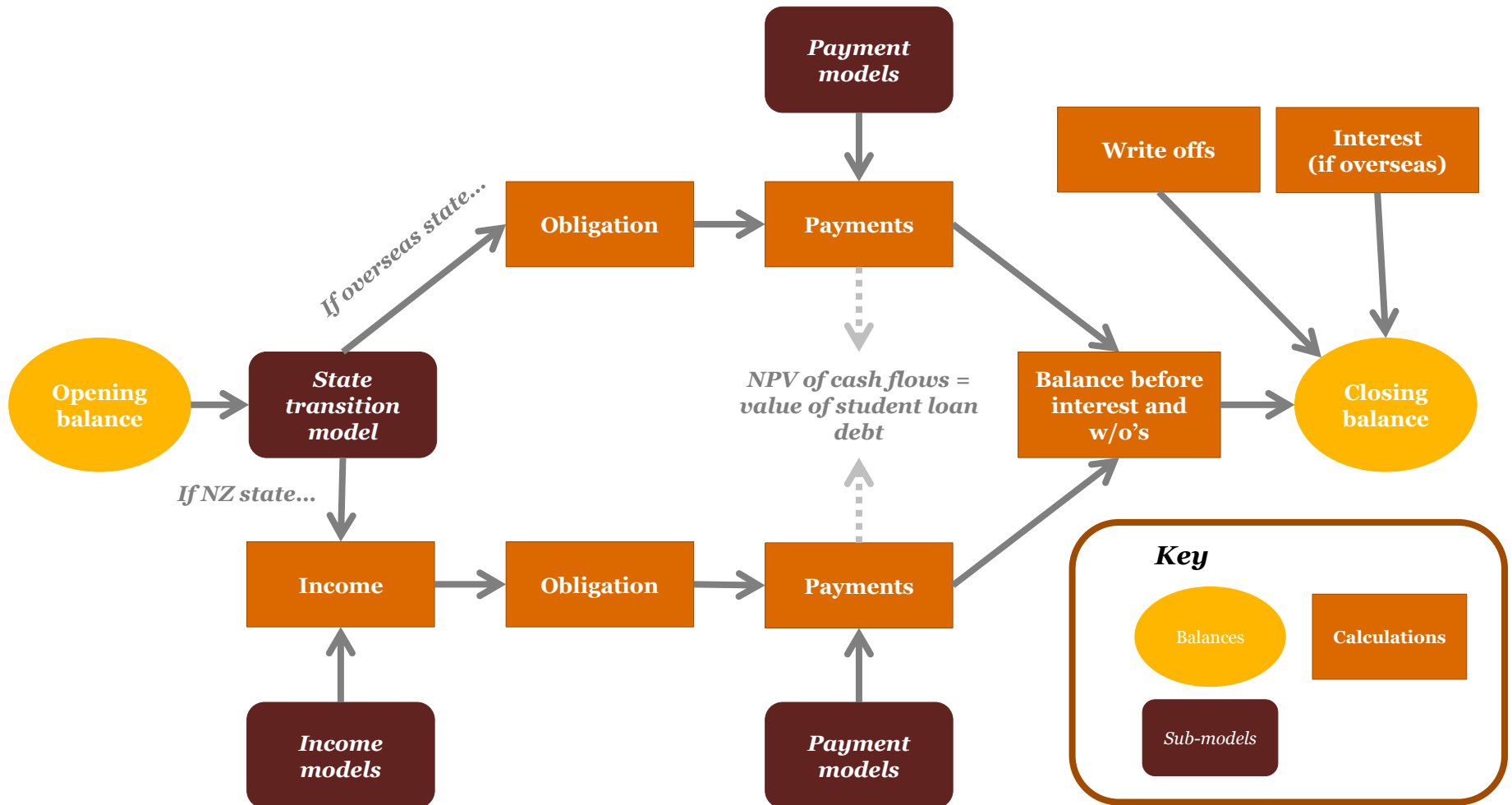 - Eventually pays off his loan

Projecting repayments
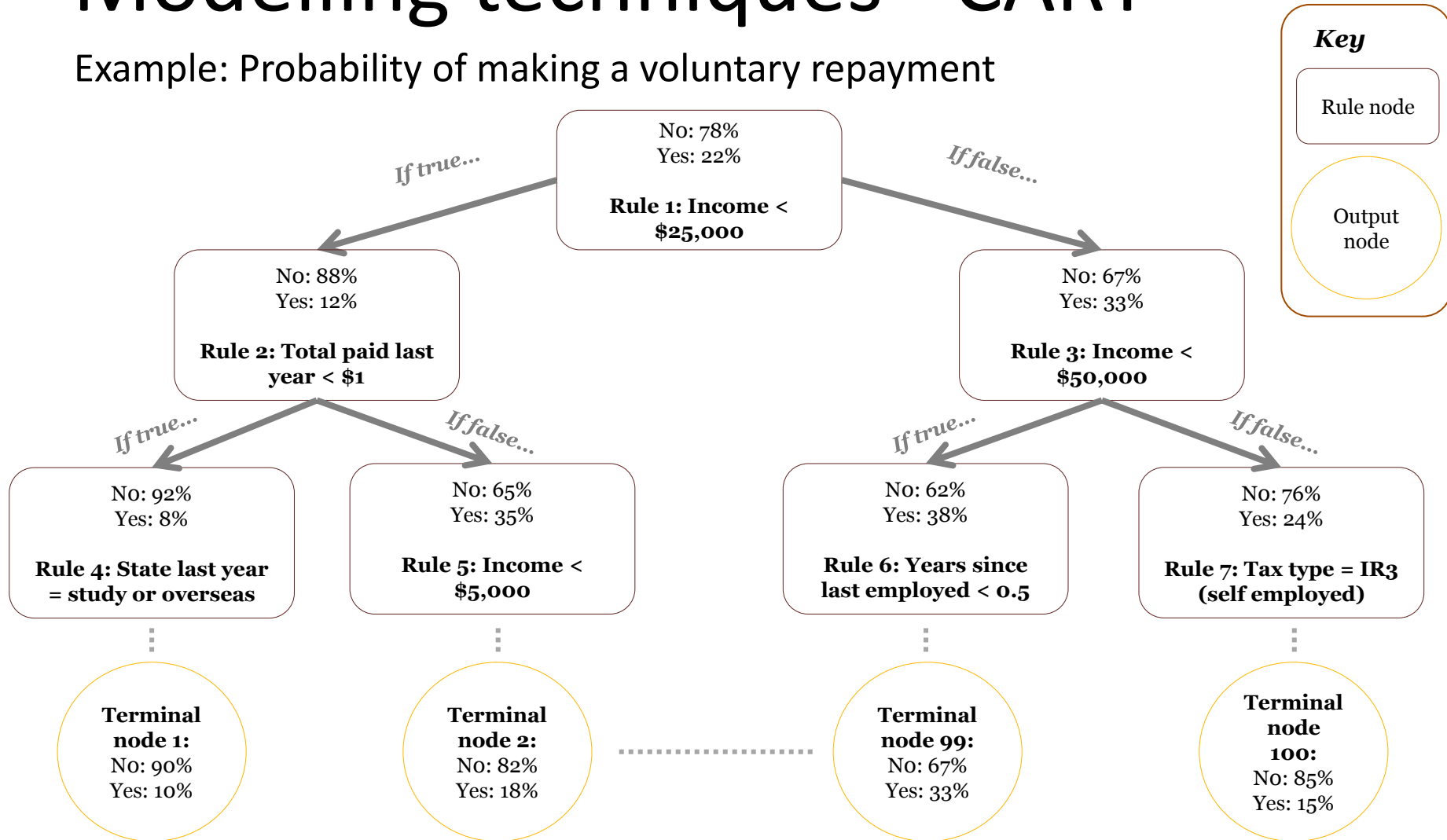
- ## What will John's repayments look like?

Studying — Little to no repayments (not earning much)

Overseas — Depends largely on John's attitude towards repaying his loan

Back in NZ but not working yet — Probably no repayments until he gets a job

Working in NZ — 12% of his income that is above $19,084

Student loan model

Modelling techniques - CART

Example: Probability of making a voluntary repayment

Key

Rule node

Output node

No: 78%
Yes: 22%

Rule 1: Income < $25,000

If true...

If false...

No: 88%
Yes: 12%

Rule 2: Total paid last year < $1

No: 67%
Yes: 33%

Rule 3: Income < $50,000

If true...

If false...

If true...

If false...

No: 92%
Yes: 8%

Rule 4: State last year = study or overseas

No: 65%
Yes: 35%

Rule 5: Income < $5,000

No: 62%
Yes: 38%

Rule 6: Years since last employed < 0.5

No: 76%
Yes: 24%

Rule 7: Tax type = IR3 (self employed)

Terminal node 1:
No: 90%
Yes: 10%

Terminal node 2:
No: 82%
Yes: 18%

Terminal node 99:
No: 67%
Yes: 33%

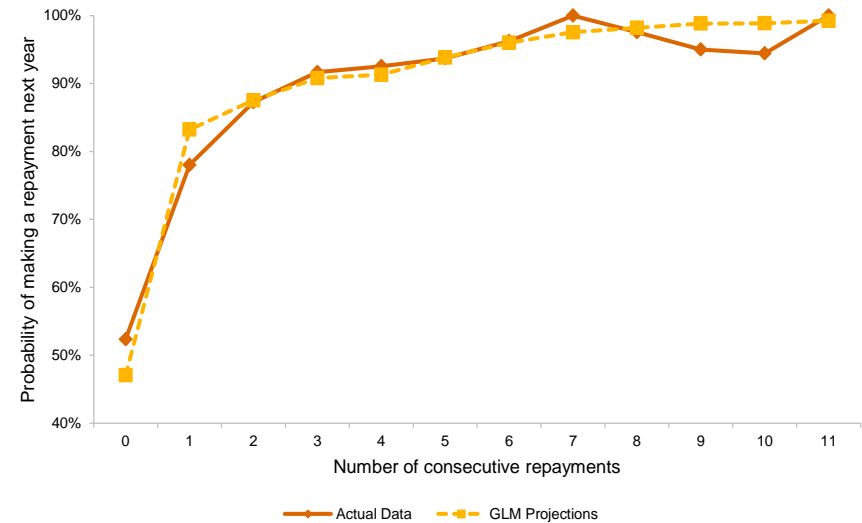**Terminal node 100:**
No: 85%
Yes: 15%

Modelling techniques - GLM

- Example: Probably of making a payment when overseas

$$\ln \frac{p}{1-p} = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots$$

Qualification type
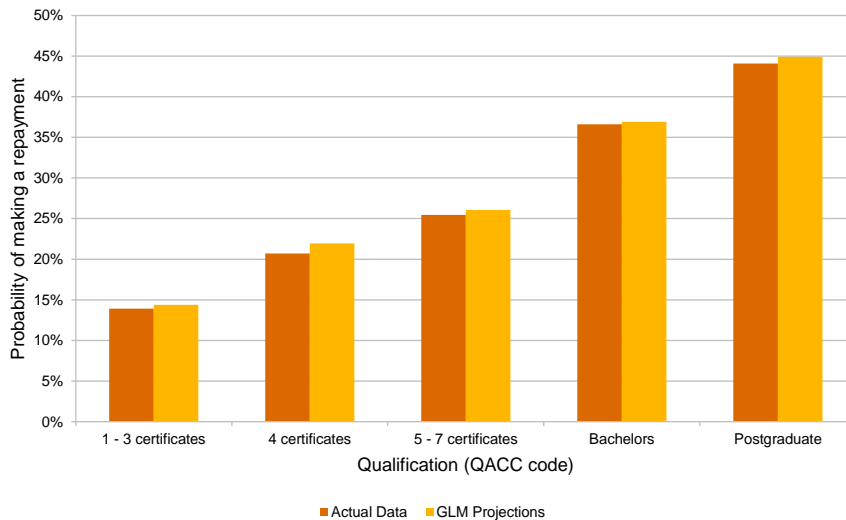
Repayment history

Challenges

- Dealing with scheme rule/policy changes
- Environmental impacts on students, such as the Global Financial Crisis
- Missing data
- Data lags – income data incomplete in the latest year
- Natural censoring (we only consider those with loans)
- Wage inflation for student loan borrowers
- Death and bankruptcy rates
- Modelling techniques (eg CART, GLM, empirical distribution)
- Interactions between sub-models
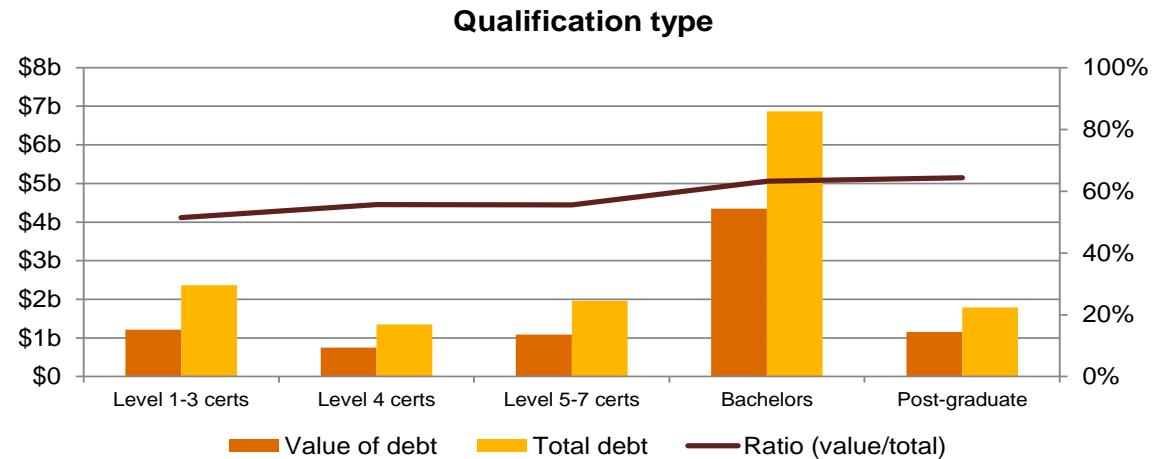
Results

Projected repayments:
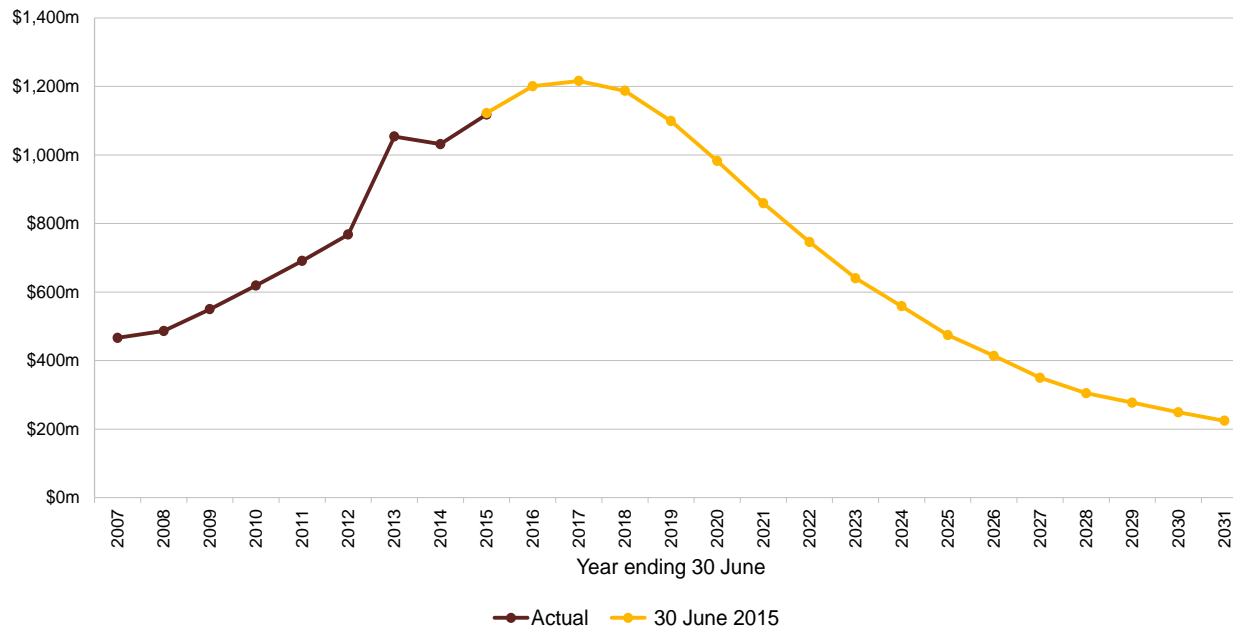
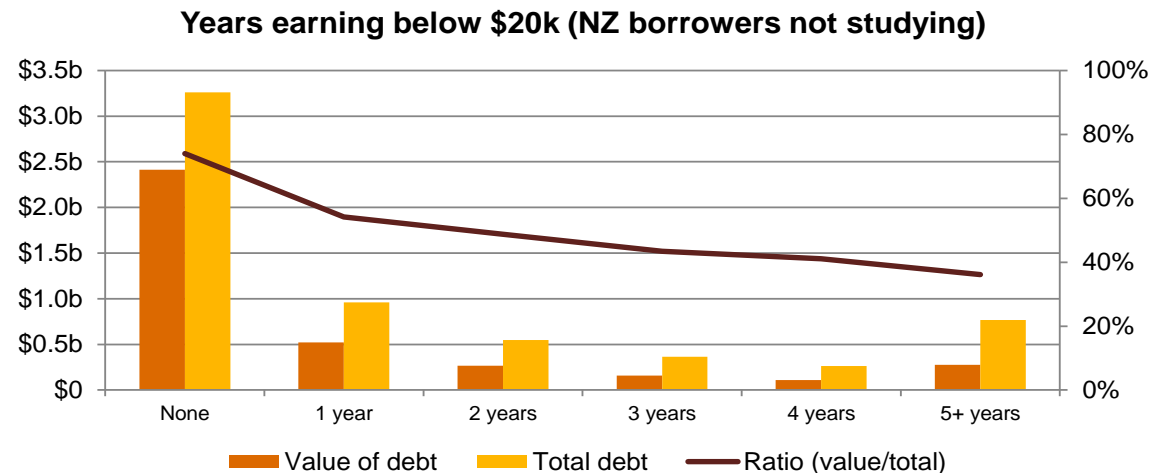

Total debt (30 June 2015)

= $14.8 billion

Value of debt

= $8.9 billion

Cohort analyses

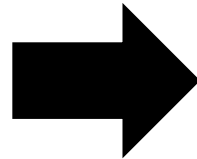- Bachelors and post-graduates have better repayment prospects

Qualification type

- The longer a borrower spends earning below $20k, the worse their repayment prospects become

Years earning below $20k (NZ borrowers not studying)
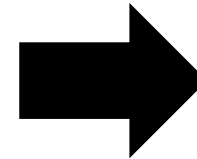
Impact of GFC on students

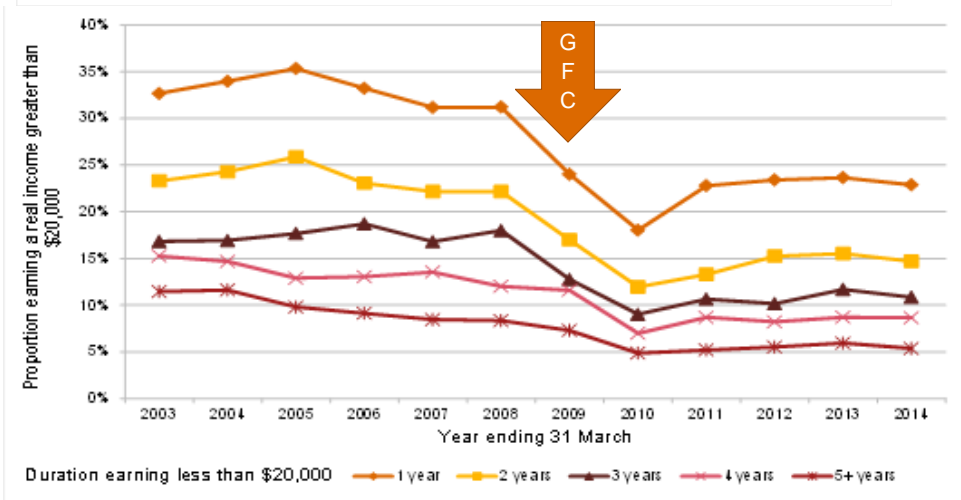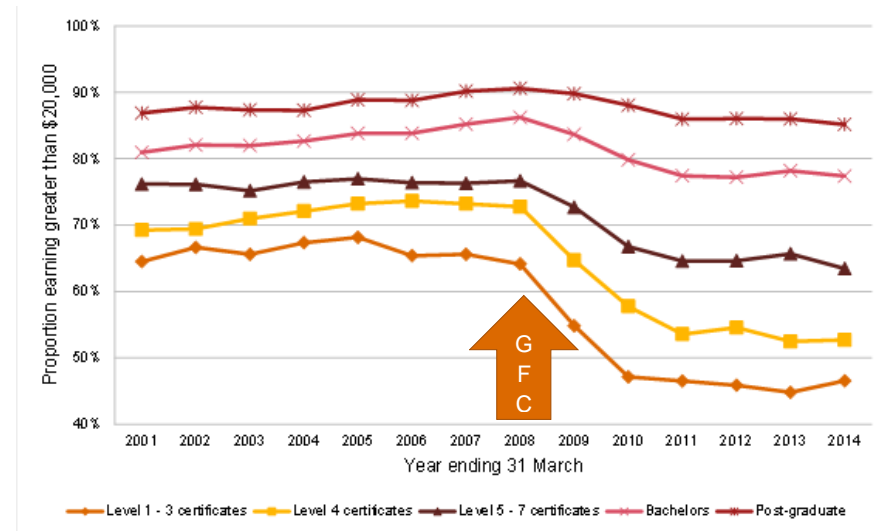Pre-GFC   GFC   Post-GFC

- The GFC significantly hurt young people

- A few found jobs and came through it OK

- Others were not so lucky

Impact of GFC on students

- The probability of earning more than $20k the year after study dropped

- The impact was less severe on those studying towards a Bachelors or higher

- The GFC has made it harder to break out of a low income (below $20k) and earn a higher income

- Students are getting stuck on low incomes

Any questions?