



Institute of Actuaries of Australia

# 4th Financial Services Forum

*Innovation in Financial Markets*

19 and 20 May 2008 – Melbourne

## Customer Level Exit Analysis and Lifetime Value

**Caroline Stevenson**  
**Quantium**



Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

## Agenda

- Current view of portfolio value
- Calculating the components
- Customer lifetime value

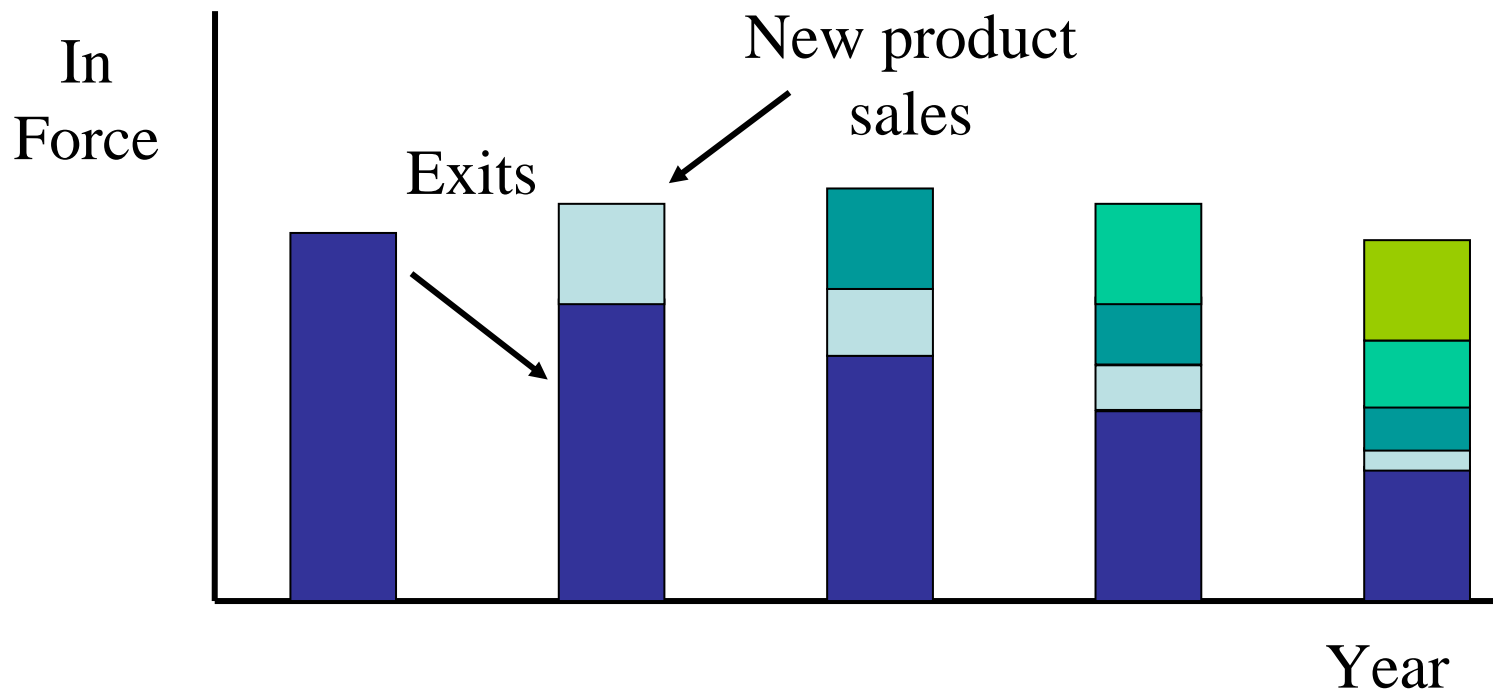


Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

# Calculating Appraisal Value

- Start by determining expected cohort





Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

## Calculating Appraisal Value

- Then overlay value, incorporating:
  - Current profitability
  - Assumed premium increases
  - Discount rates



## Exit Analysis

- Traditional Modelling based on cohort level analysis
  - Broad understanding of effects
  - Separating concurrent drivers?
- Can improve on this with customer level analysis



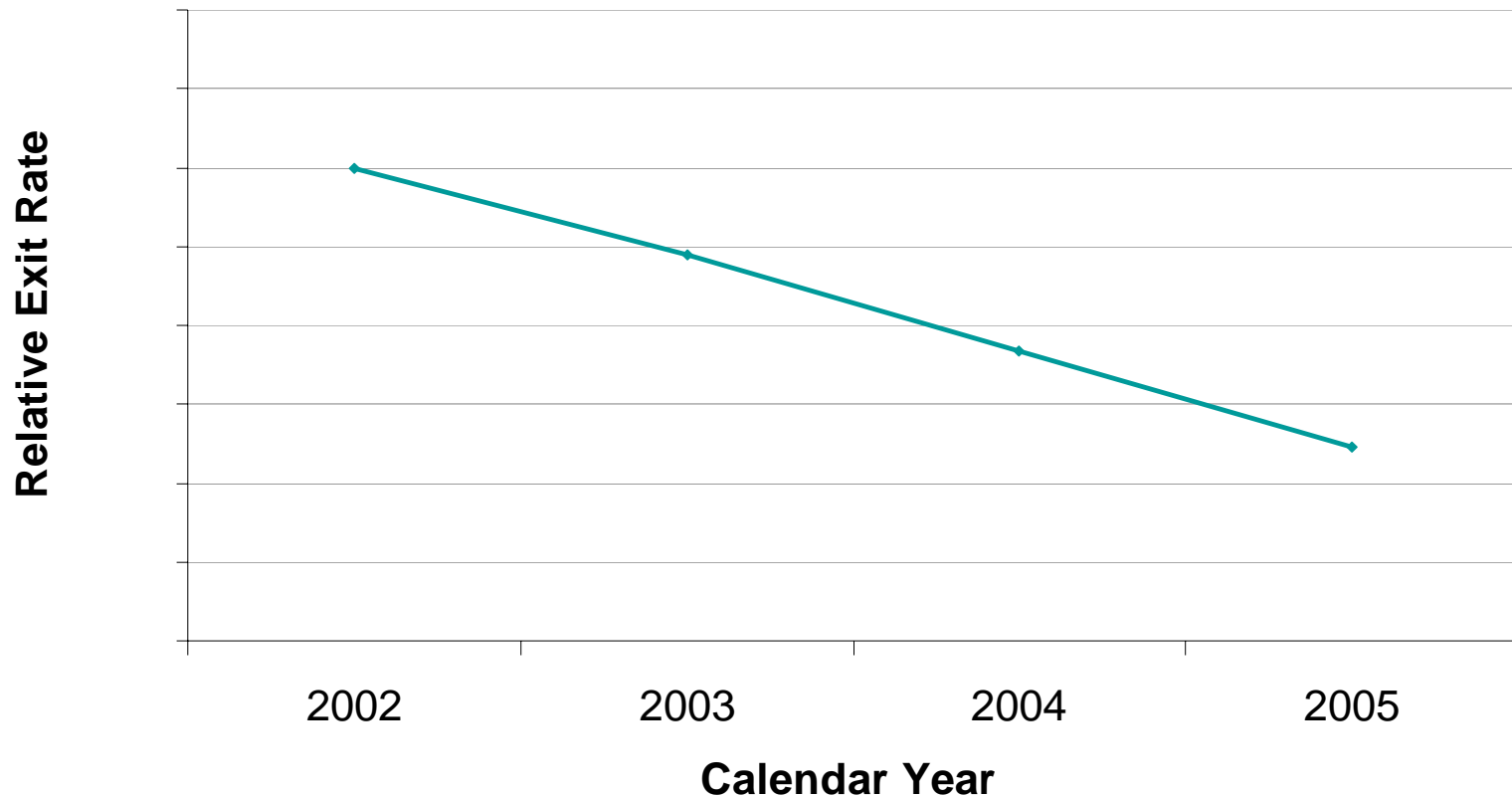


Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

# Improving Exit Experience?

**Observed Exit Rate Experience by Calendar Year**



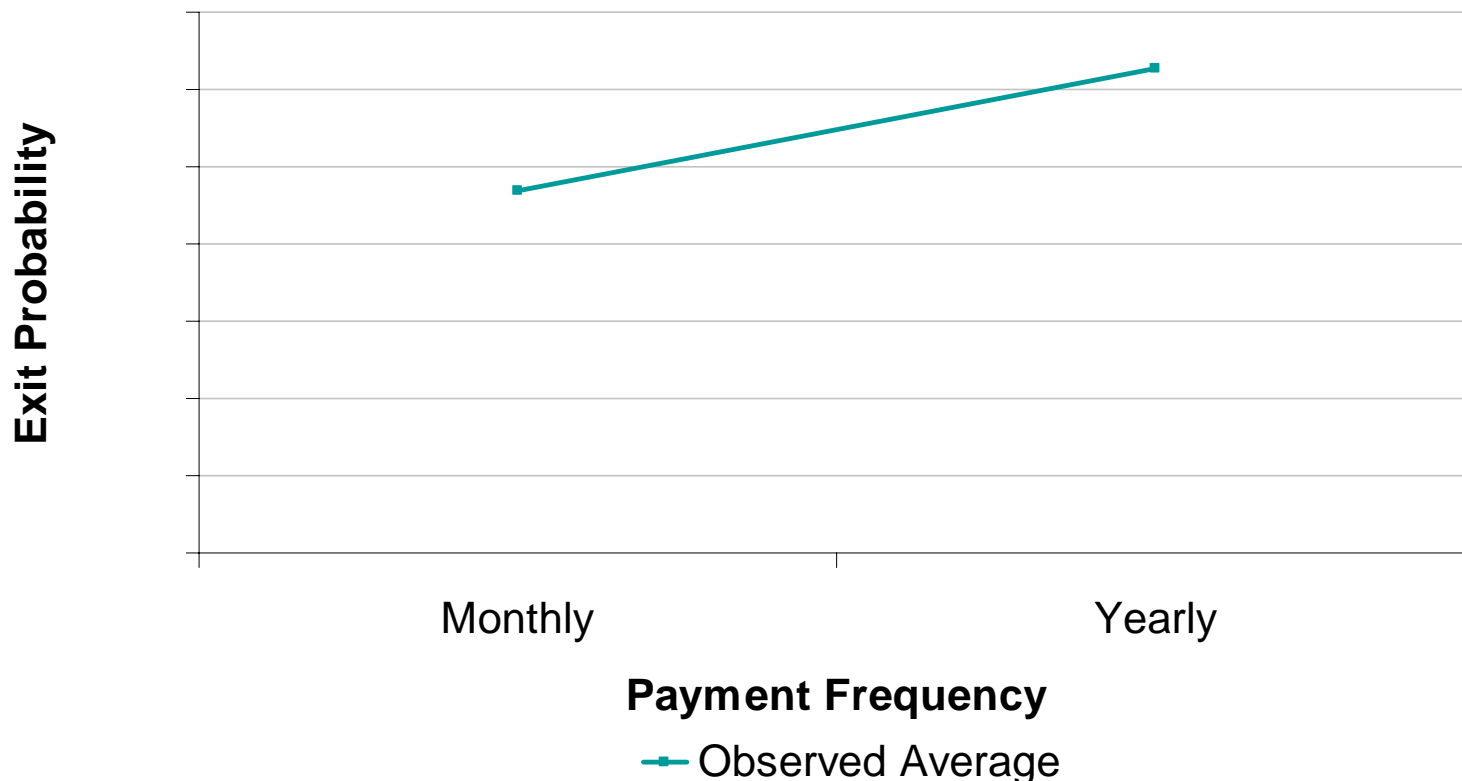


Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

# Utilising Cohort Based Analysis to Drill into the Experience

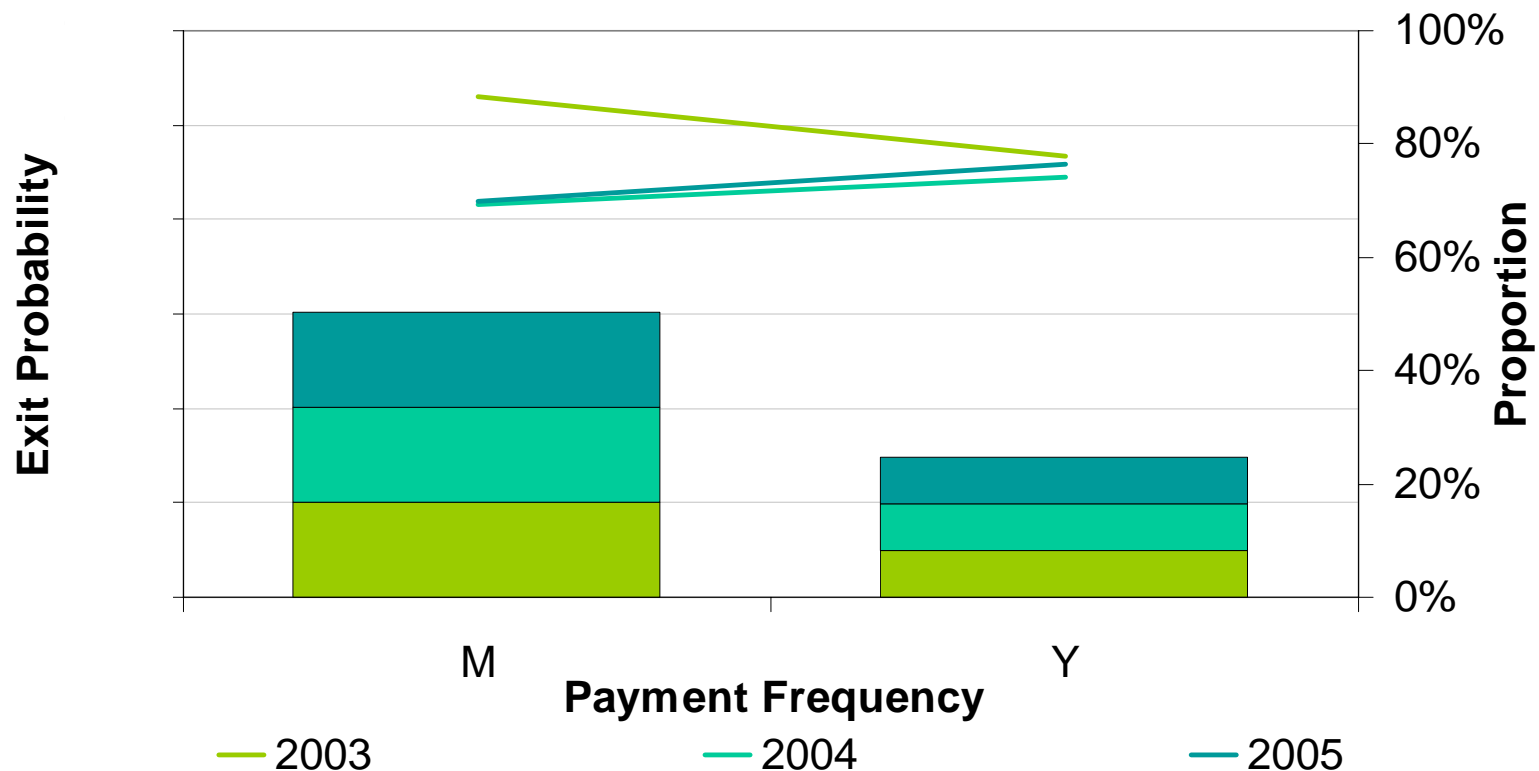
## Observed Exit Rates by Payment Frequency





# Analyse how this varies over time

**Observed Exit Rate Experience by Year and Payment Frequency**

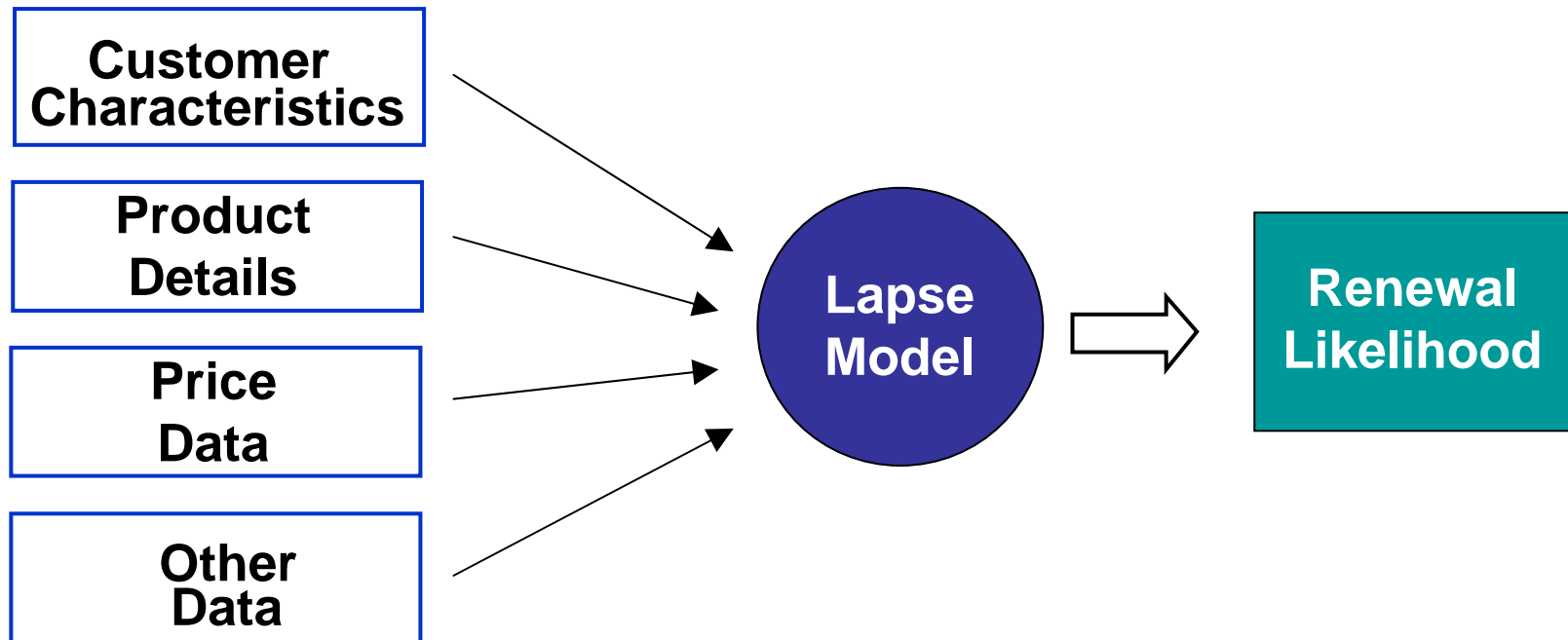






# Modelling Exit Experience

- Build GLMs at customer level





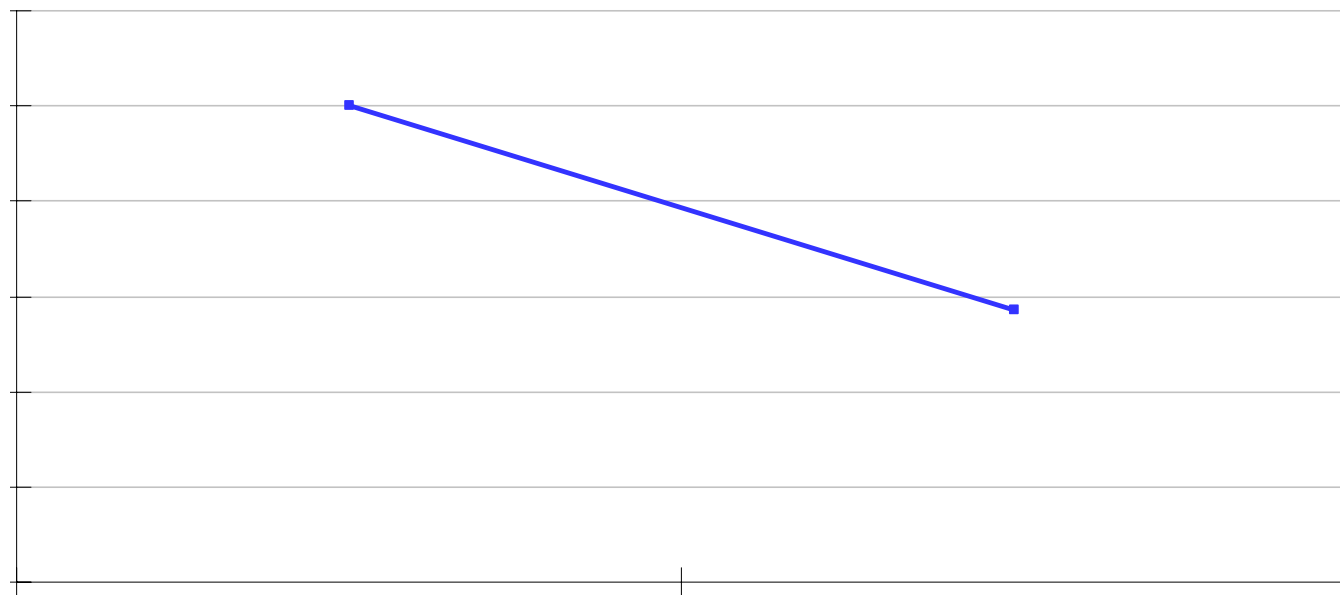
Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

# Pure Effect of Payment Frequency

**Relative Propensity to Exit by Payment Frequency**

Relative Propensity to Exit



Monthly

Yearly

Payment Frequency

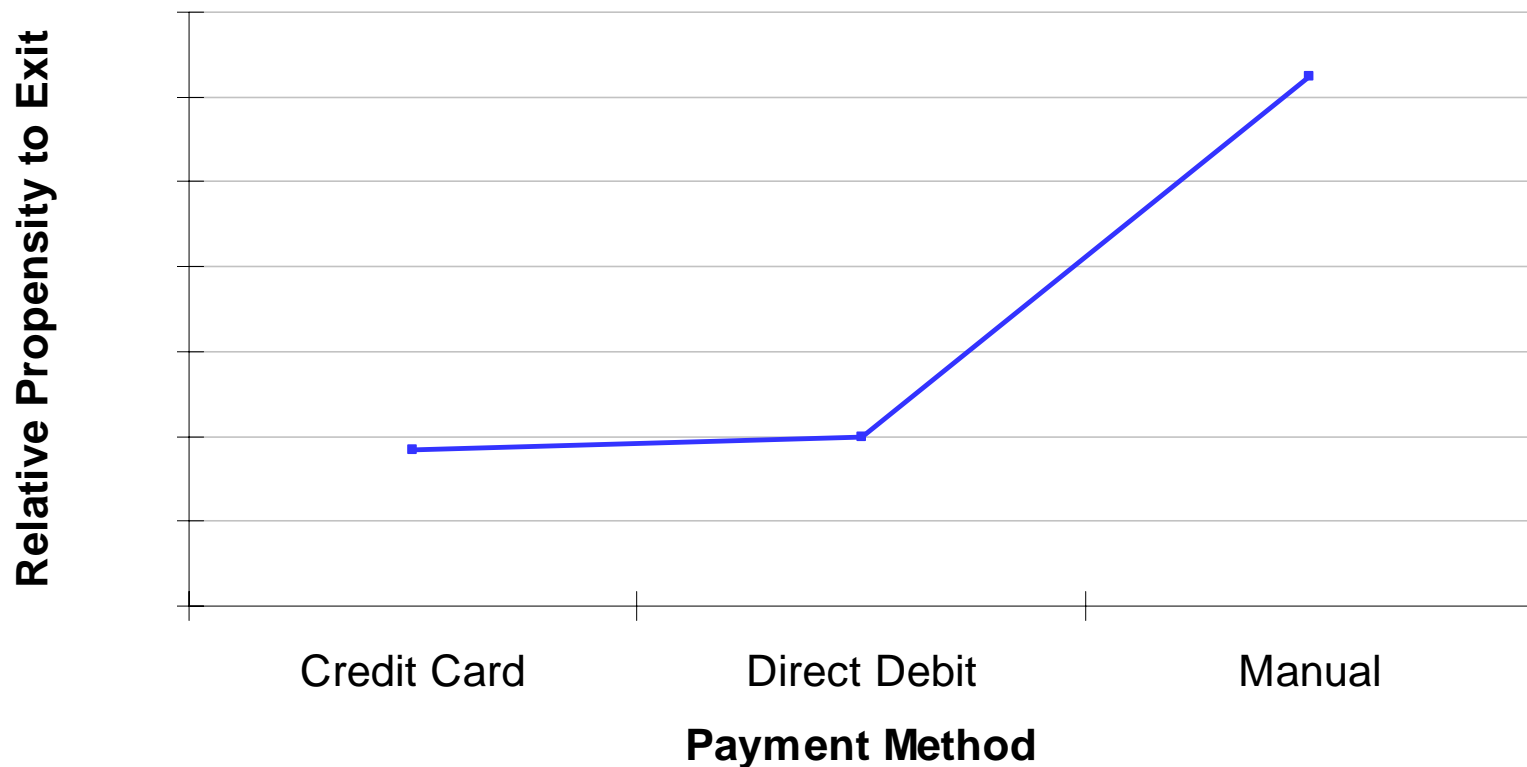


Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

# What is Causing This?

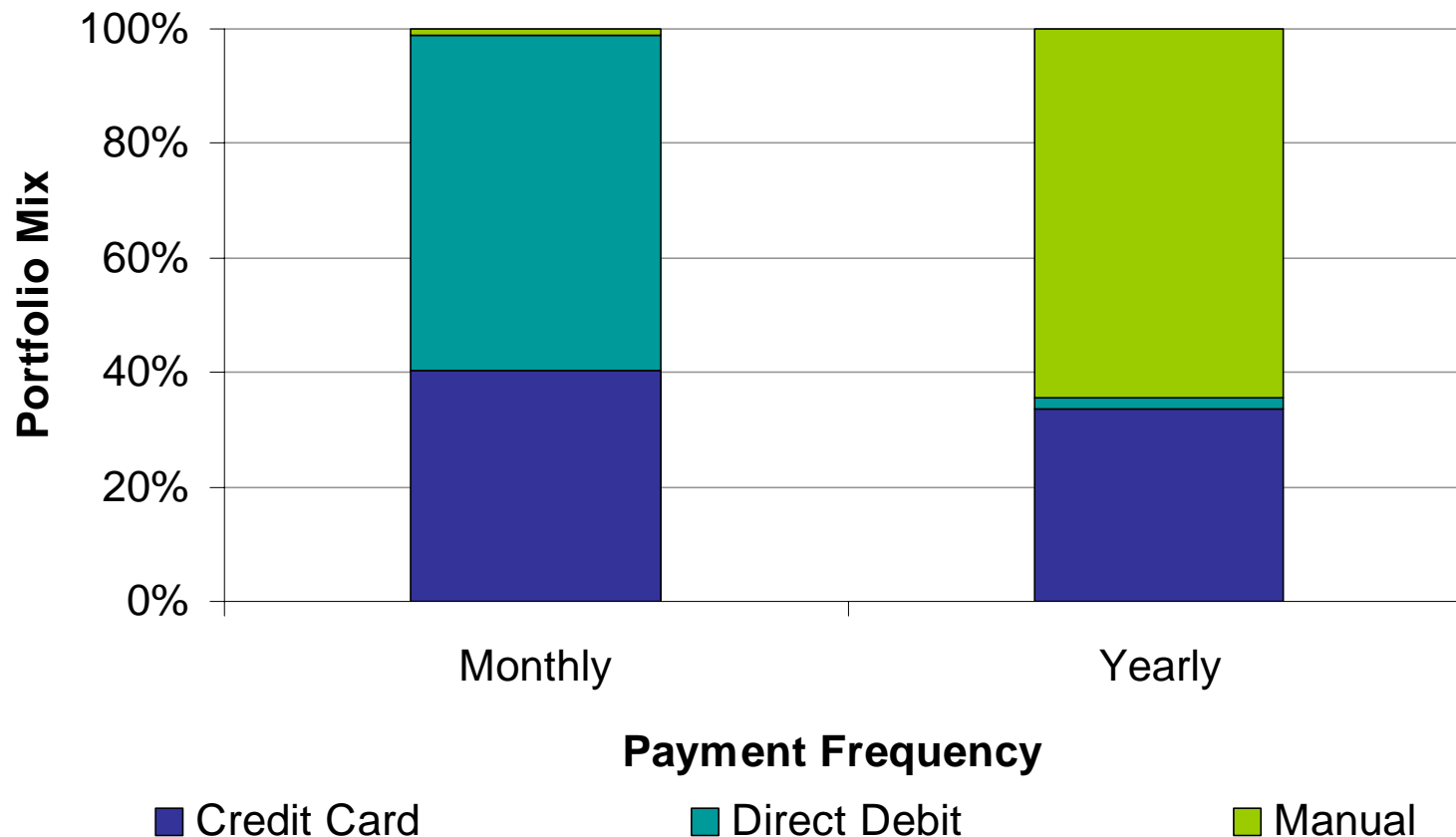
## Relative Propensity to Exit by Payment Method





# What is Causing This?

**Term Life - Mix of Payment Method by Frequency**



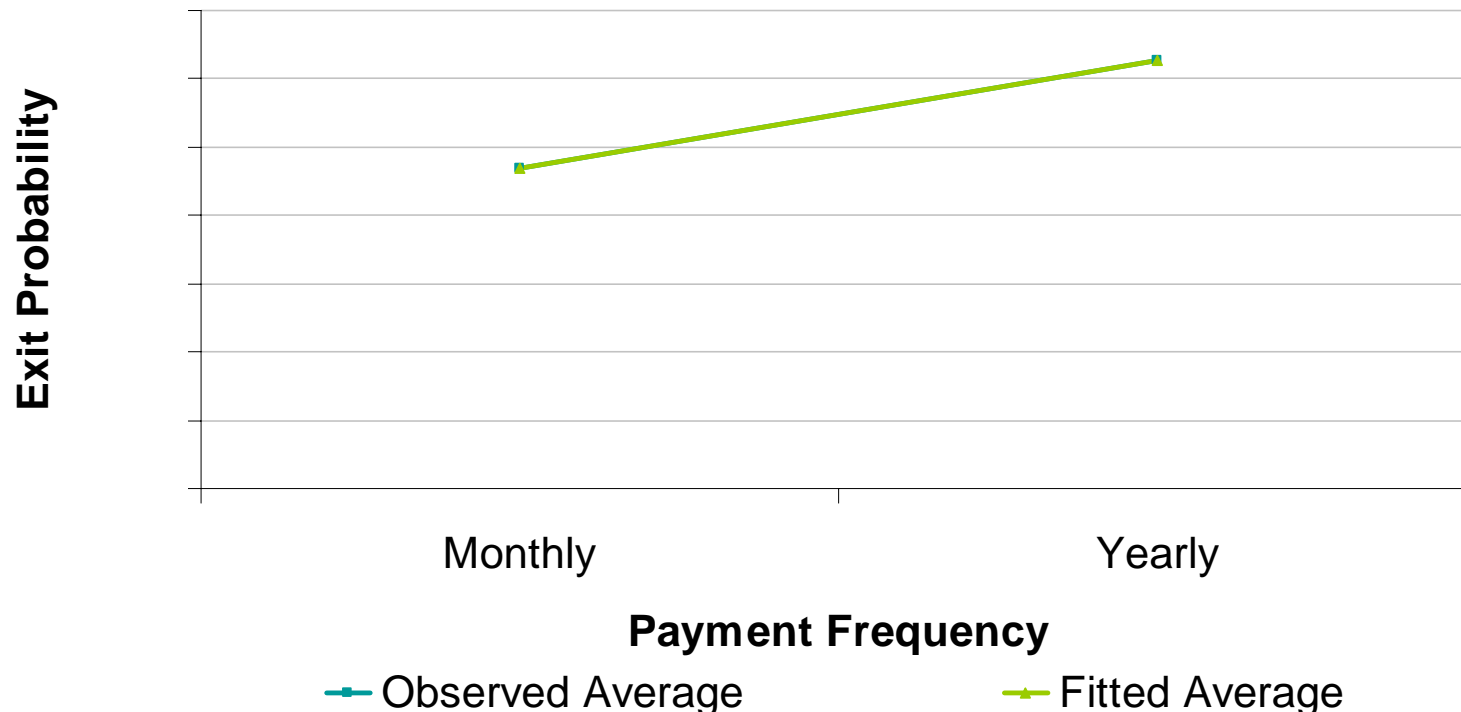


Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

# We Predict Observed Experience

## Observed & Fitted Exit Rates by Payment Frequency





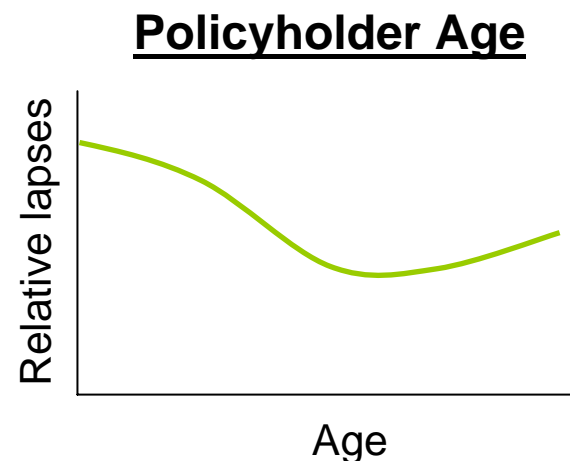
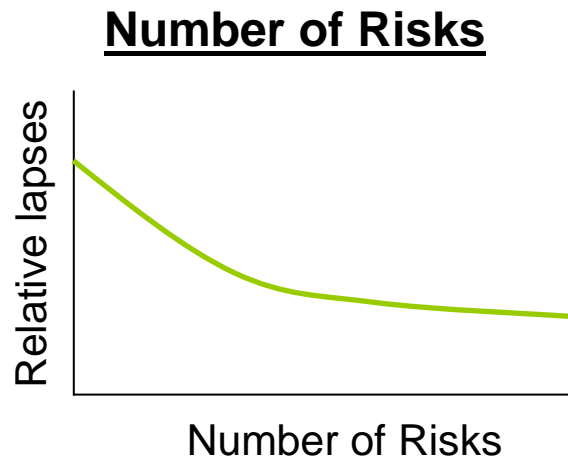
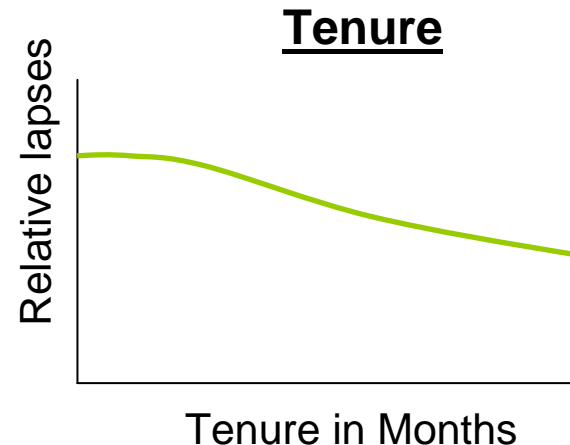
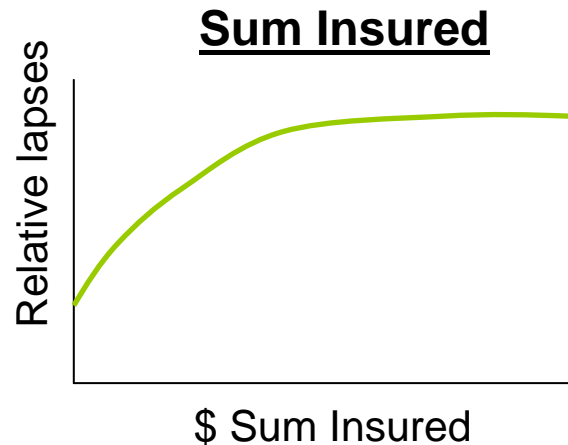


Institute of Actuaries of Australia

# 4th Financial Services Forum

*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

## We Test Numerous Factors



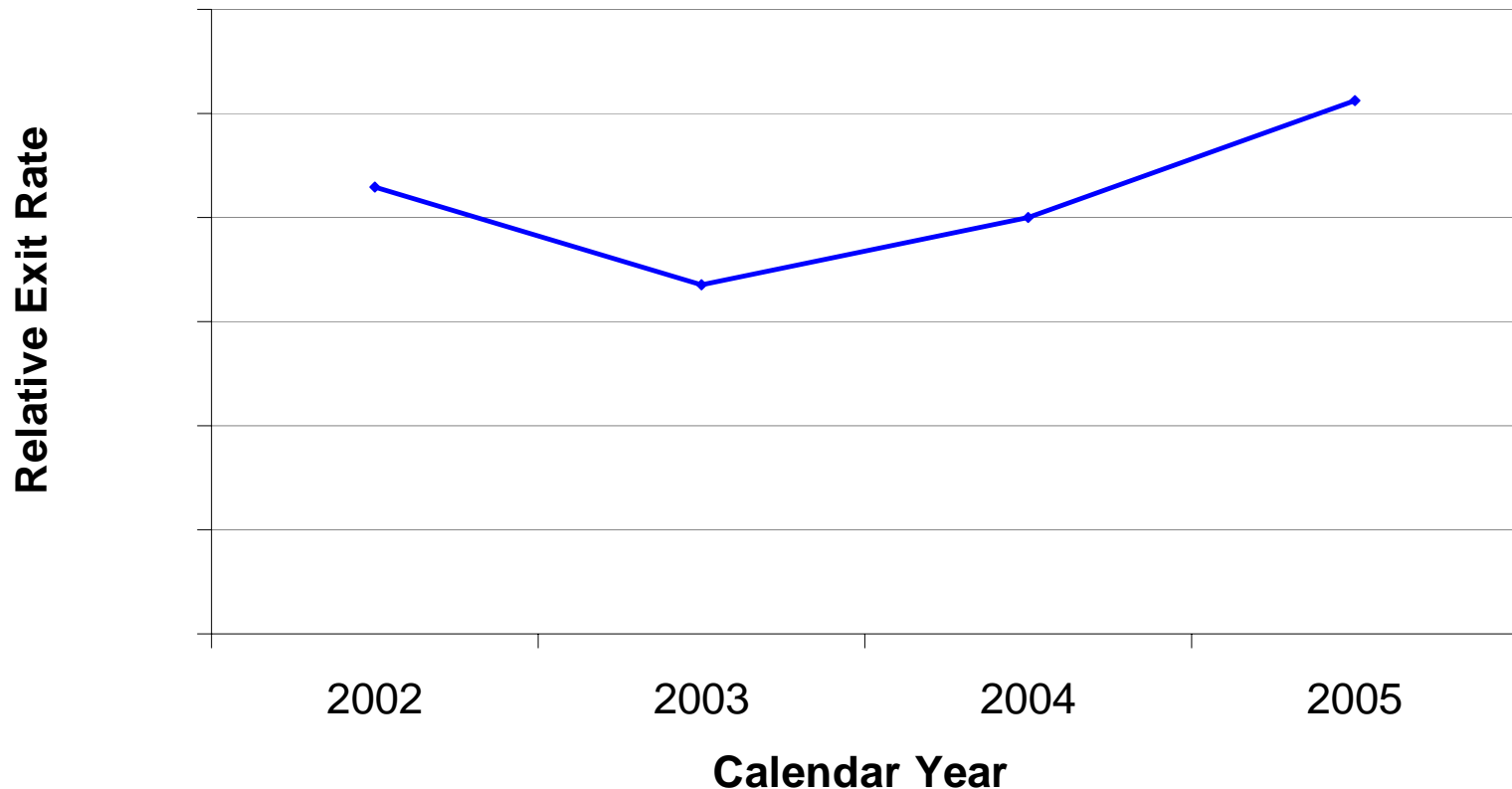


Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

# Exit Experience was Deteriorating

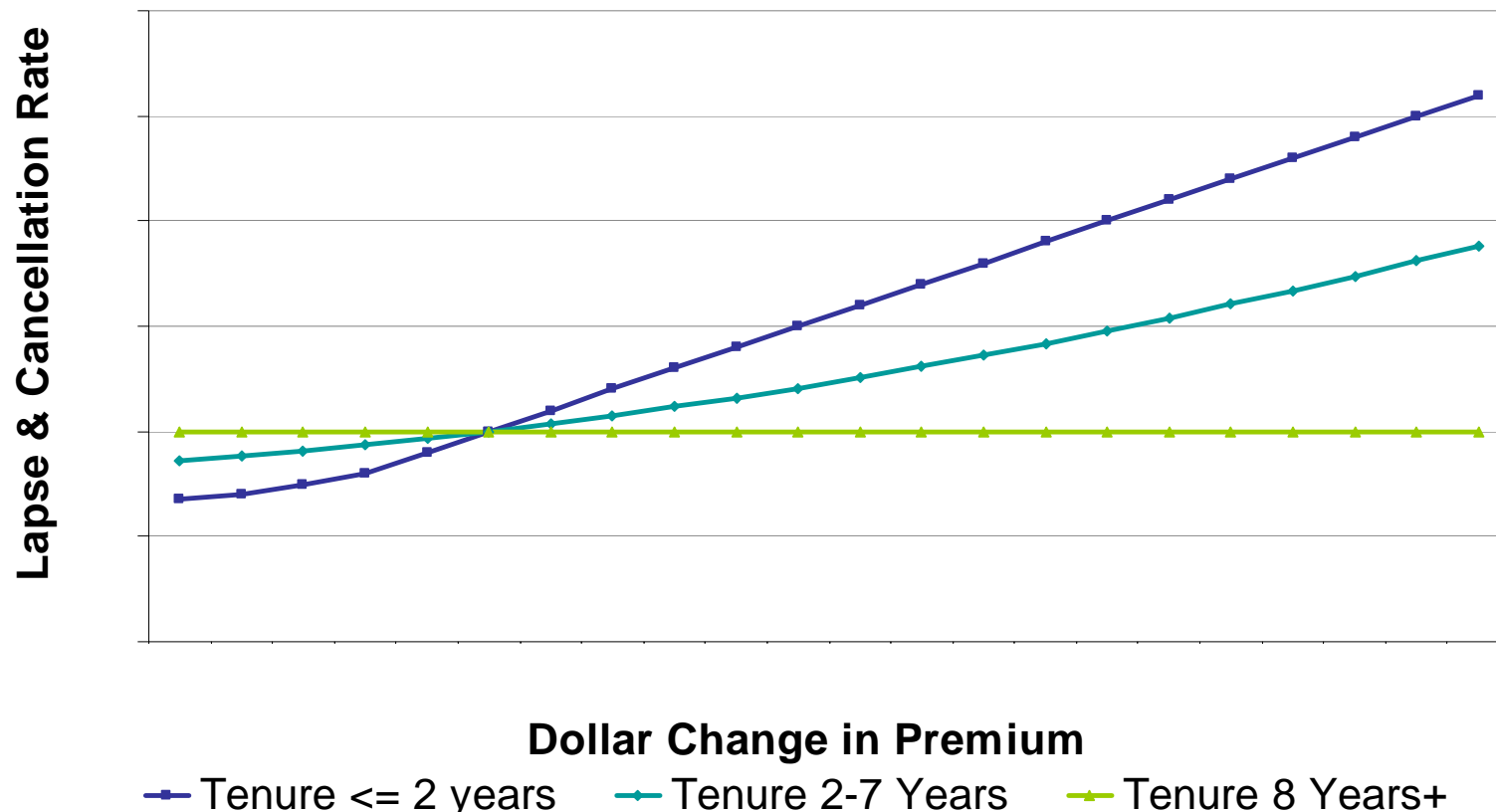
**Relative Propensity to Exit by Calendar Year**





# Including Price Effects

## Impact of Premium Change by Tenure on Exits





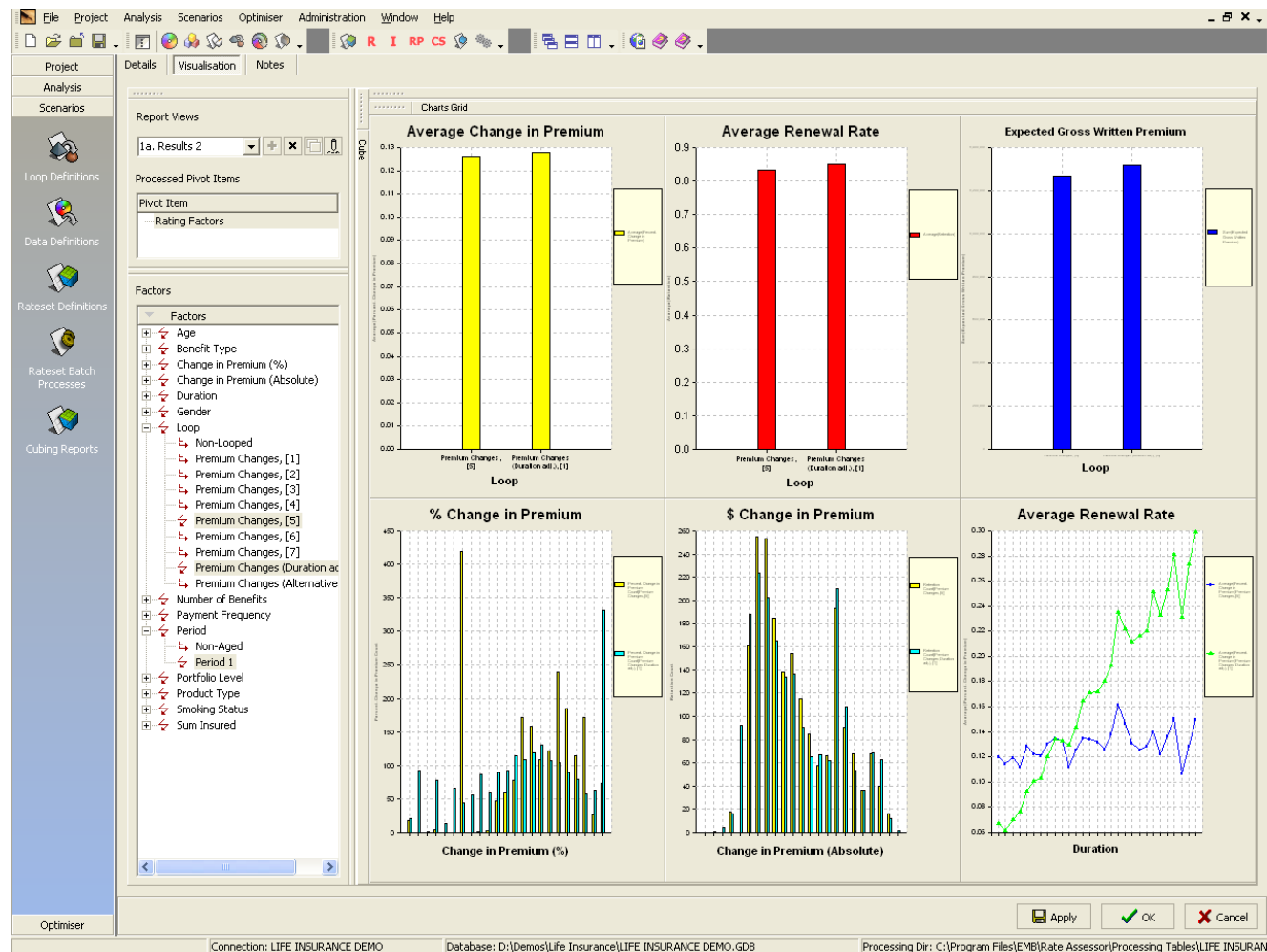
Institute of Actuaries of Australia

# 4th Financial Services Forum

## Innovation in Financial Markets

19 and 20 May 2008 — Melbourne

## Scenario testing tool





Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

## Improved Strategic Insights

- Detection of undistorted trends
- Appraisal value calculations need to incorporate appropriate trends in exit experience
- Targeted pricing action based on desired portfolio outcomes



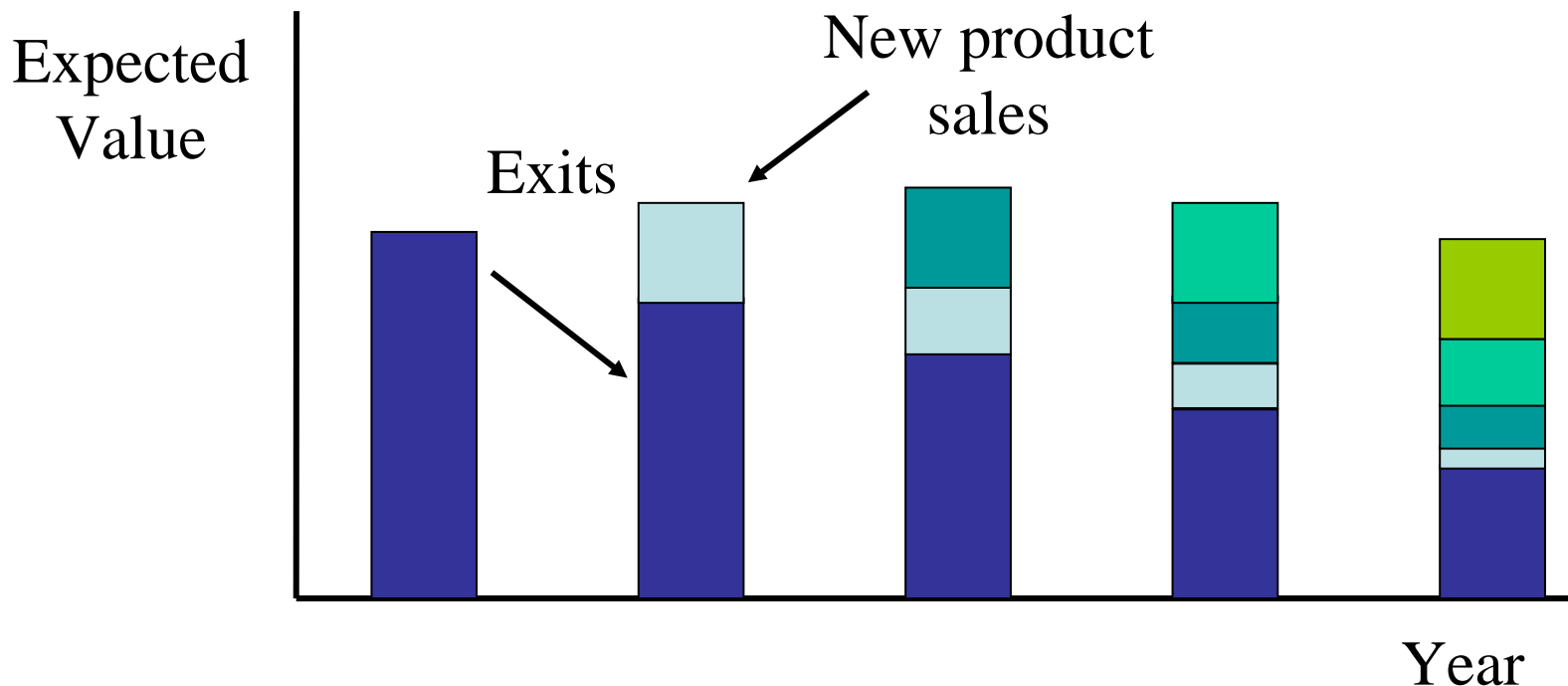


Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

# Returning to Value Calculations

- Product level v. Customer level view





Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

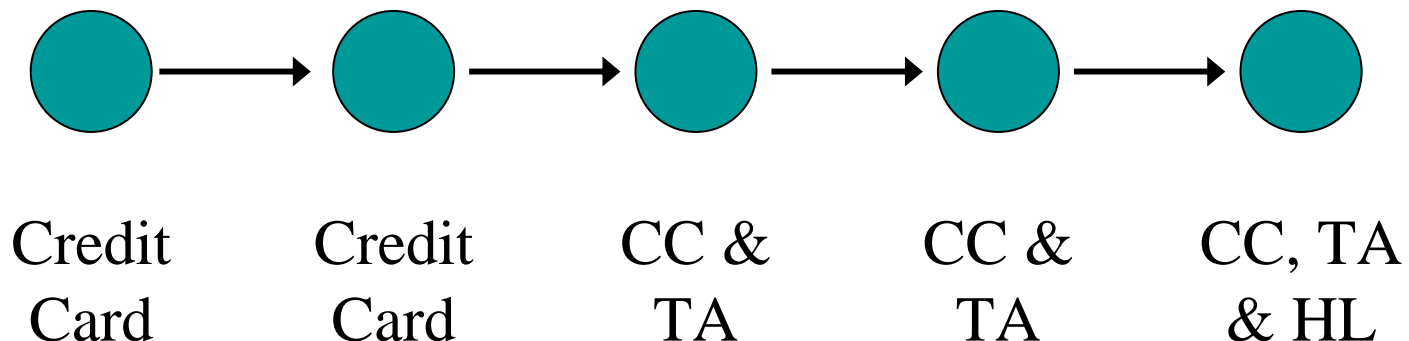
## Why a Customer Level View?

- Companies moving from product to customer/segment view
- Assess intrinsic value of, and hence justifiable investment in, different customer segments



# Need to Consider Path for Each Customer

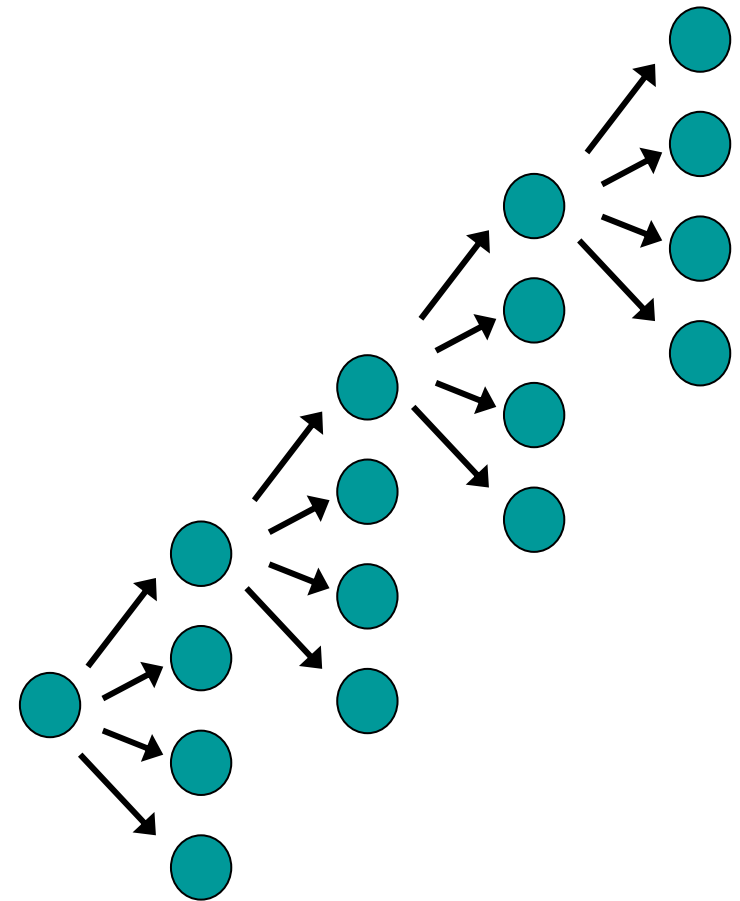
- At each point in time, consider product take-up/lapse
- Dynamically adjusting for customer characteristics





# Huge Proliferation of Potential Paths

- Path Volumes increase exponentially with increased numbers of products
- >33m paths for product states for 5 products over 5 years
- More once add value



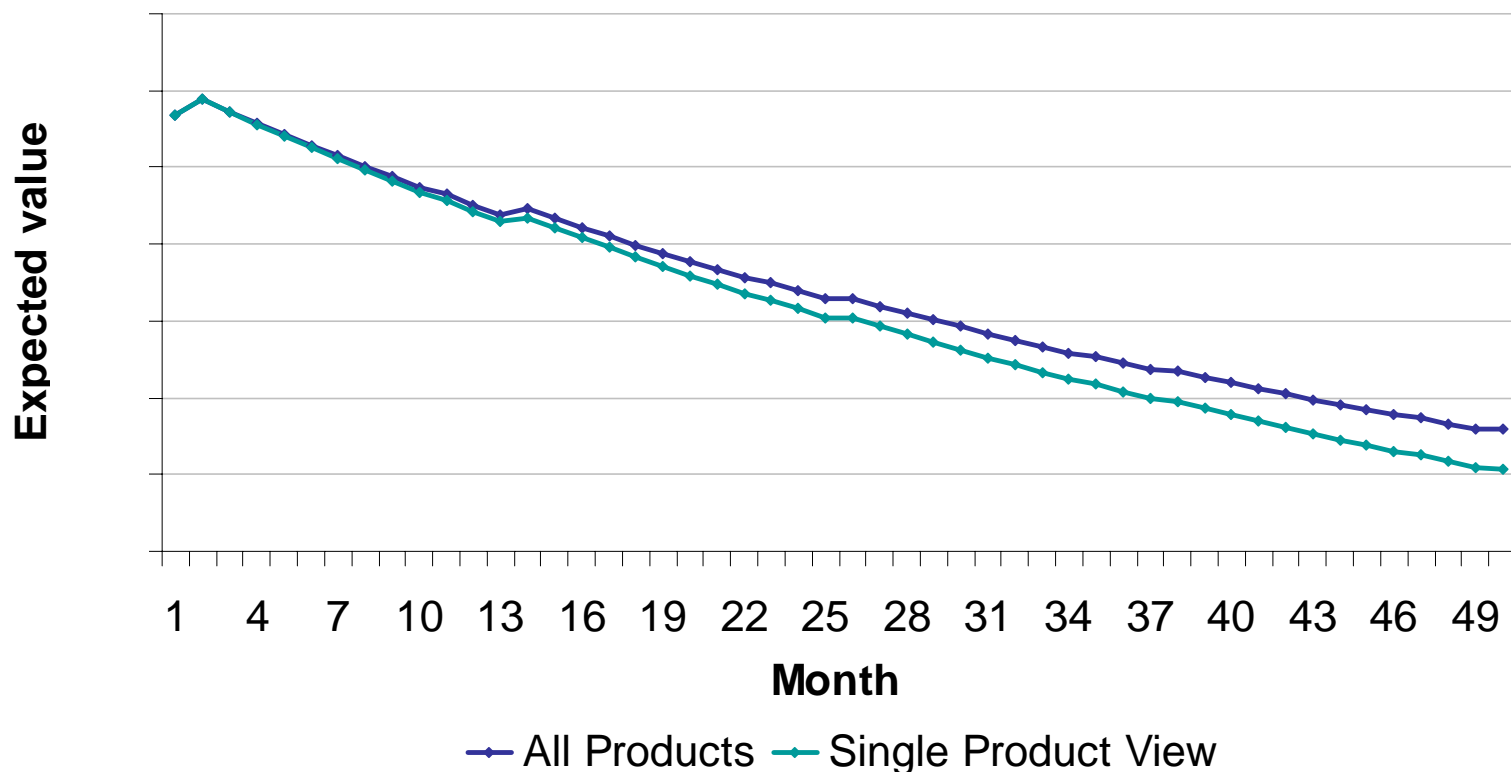


Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

# Other Products Important Even for Single Product View

Value from Transaction Account over Time

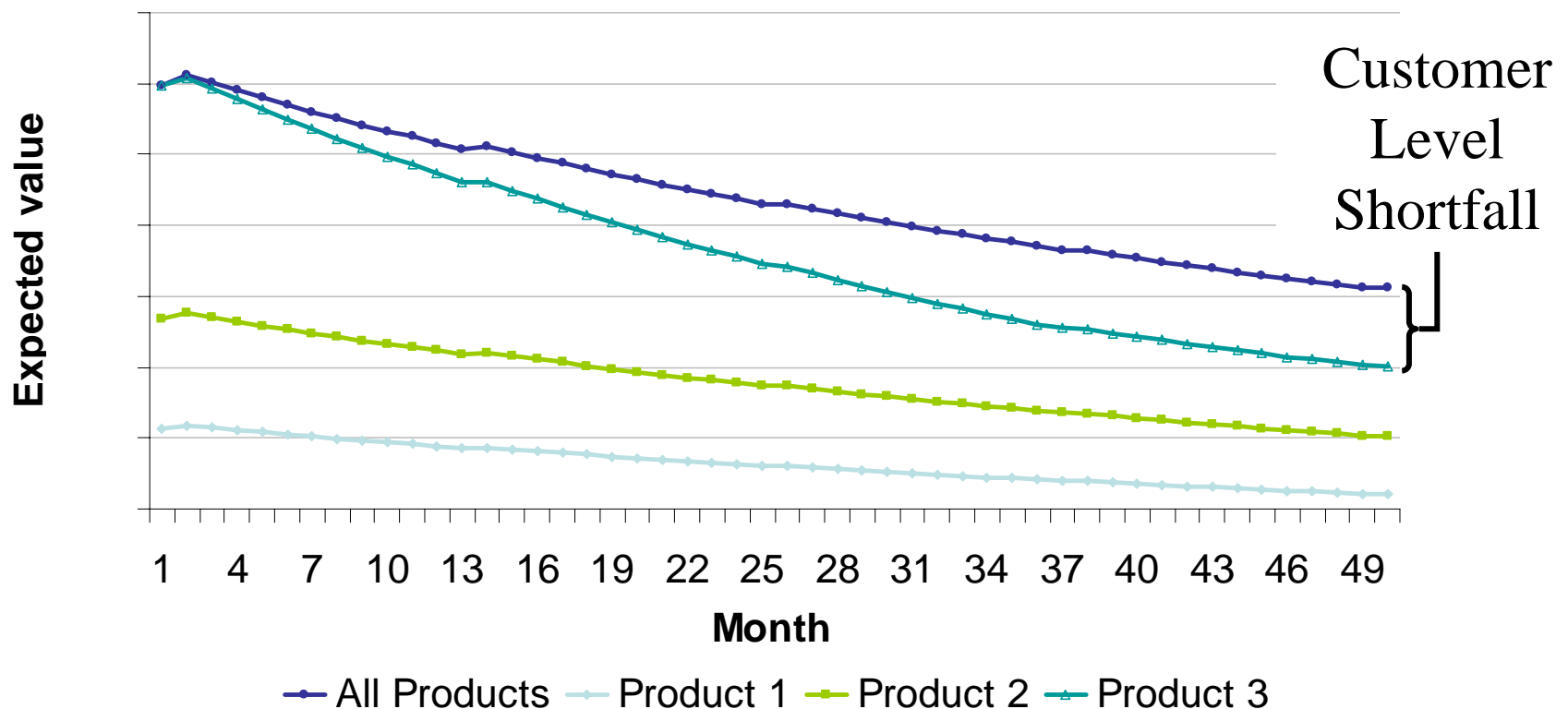






# Potential Error at Customer Level

## Value from Three Products over Time





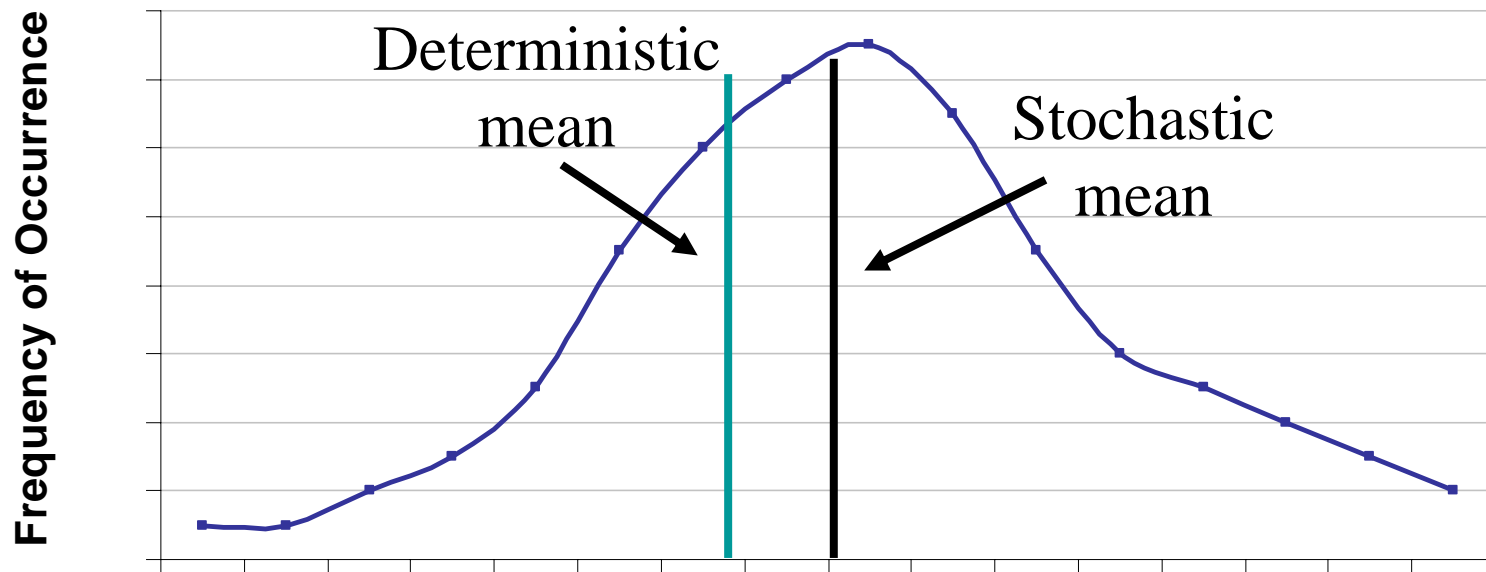
## Need for Stochastic Approach

- Simple Markov Chain approaches only consider current state
- Necessary to track individual paths due to impact of factors such as product tenure
- Proliferation of paths lead to requirement for a simulation approach



# Understanding Portfolio Value

## Expected Portfolio Value



- Deterministic approaches can lead to incorrect conclusions, due to tenure effects

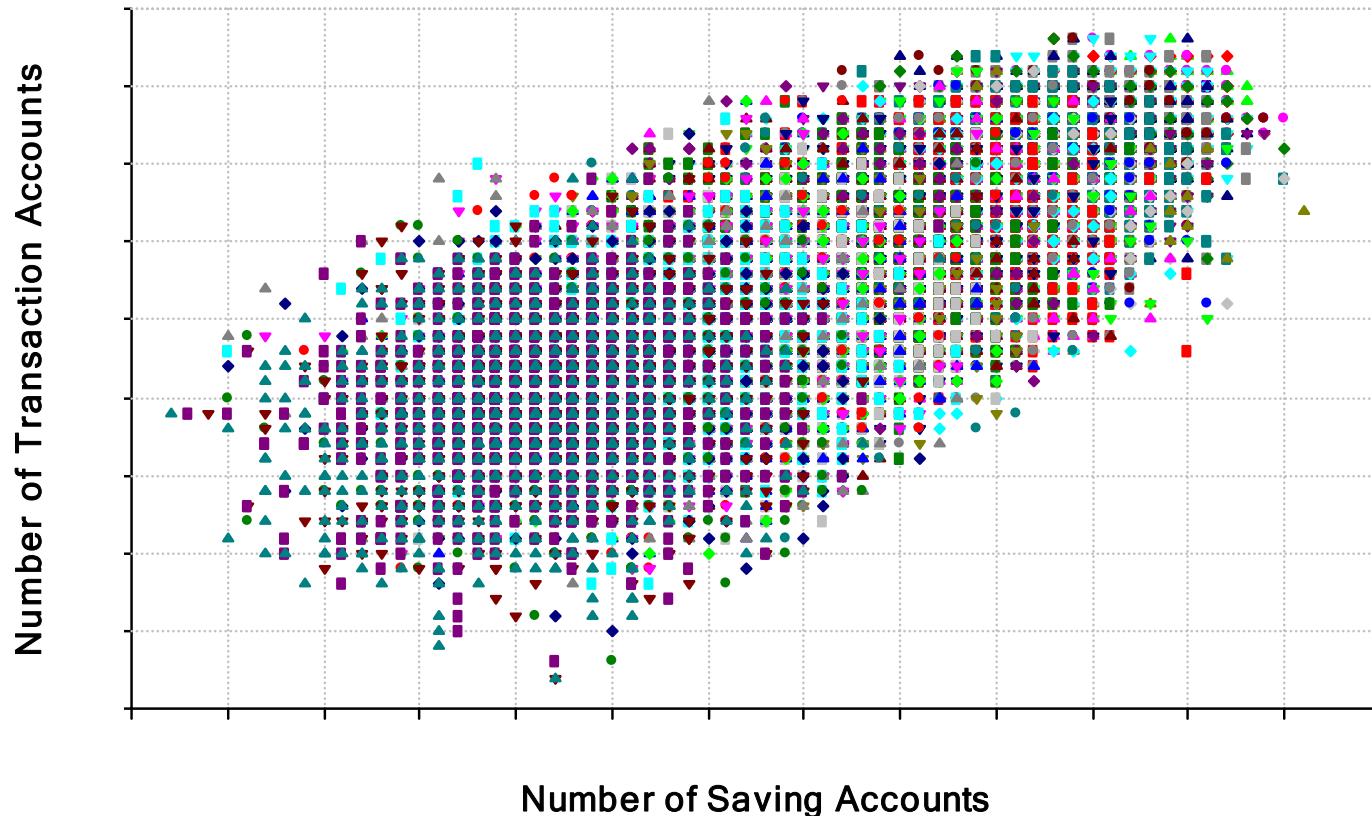


Institute of Actuaries of Australia

**4th Financial Services Forum**  
*Innovation in Financial Markets*  
19 and 20 May 2008 — Melbourne

# Obtain Understanding of Correlation of Product AV

Correlation between Saving and Transaction Account Holdings







## Conclusions

- Cohort level analysis of AV components can lead to incorrect conclusions
- Single product view of value is flawed
- Organisations moving to customer level view
- Need to adapt and go beyond current AV approaches, drawing on customer level modelling and simulation