ACTUARIAL SOCIETY OF SOUTH AFRICA

QUANTIFYING RISK, ENABLING OPPORTUNITY

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Option selection dynamics

Option selection

What drives consumers' product choices?

Behavioural changes before and after option changes

Can we improve on assumptions

- *…in product design and budgeting*
- *…in medical scheme amalgamations*

Projection methodologies

A precarious assumption

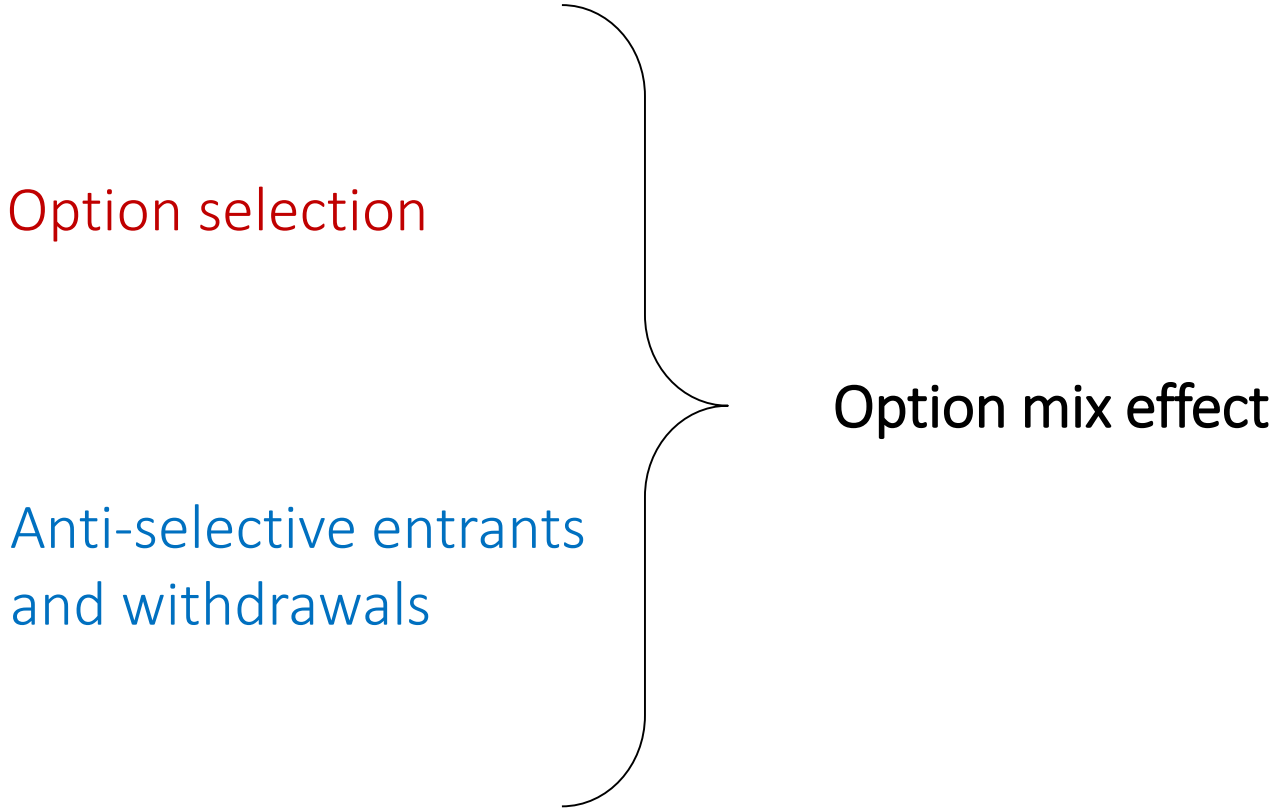
Terminology

Benefit option. Option. Product. Plan. Package.

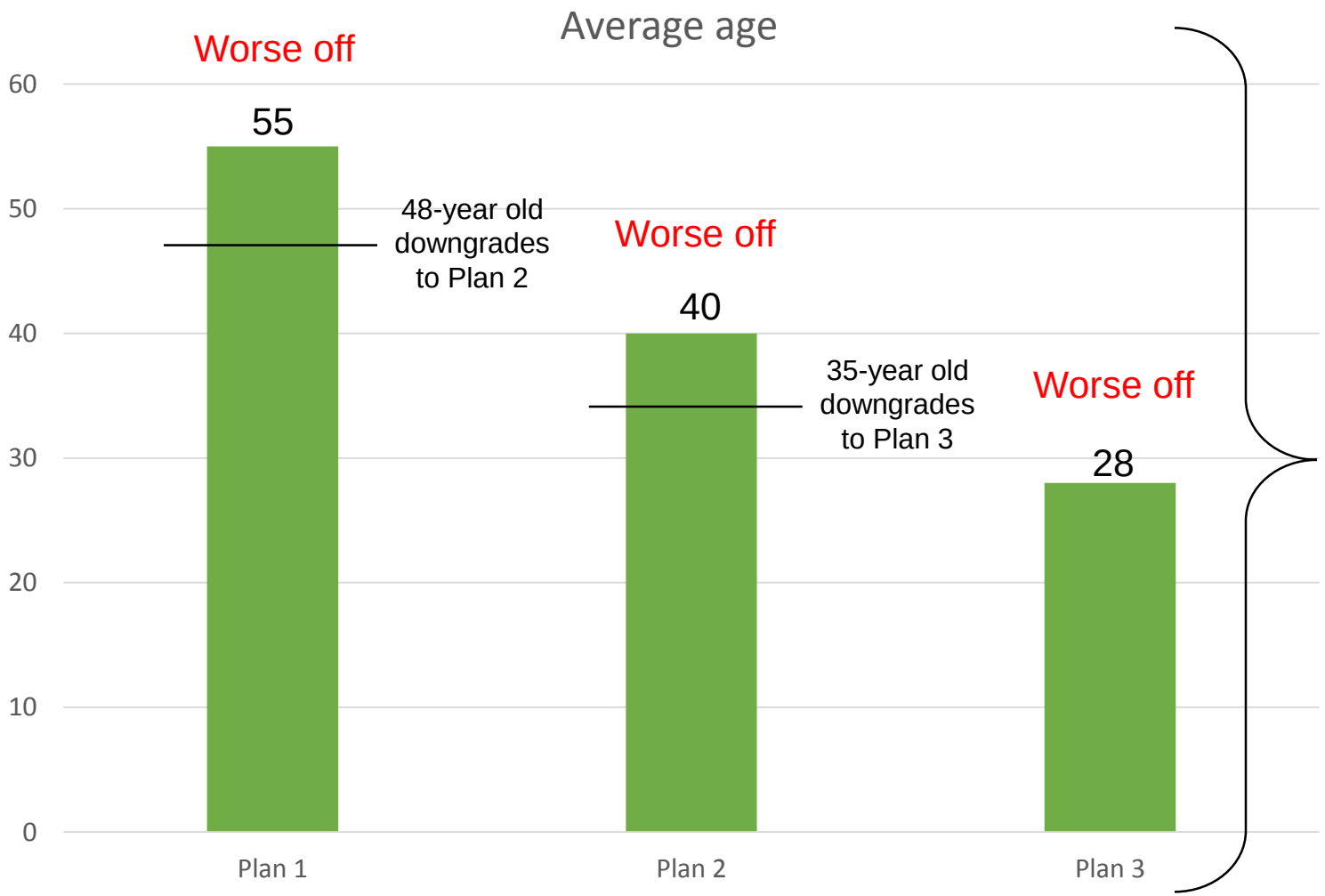
Regulatory definition – none provided
*but sections 33 and 34 refer to "**benefit option**"*

Option selection vs option mix (plan mix)

Option mix or plan mix



Option mix – illustrative impact



Scheme as a whole is not worse off

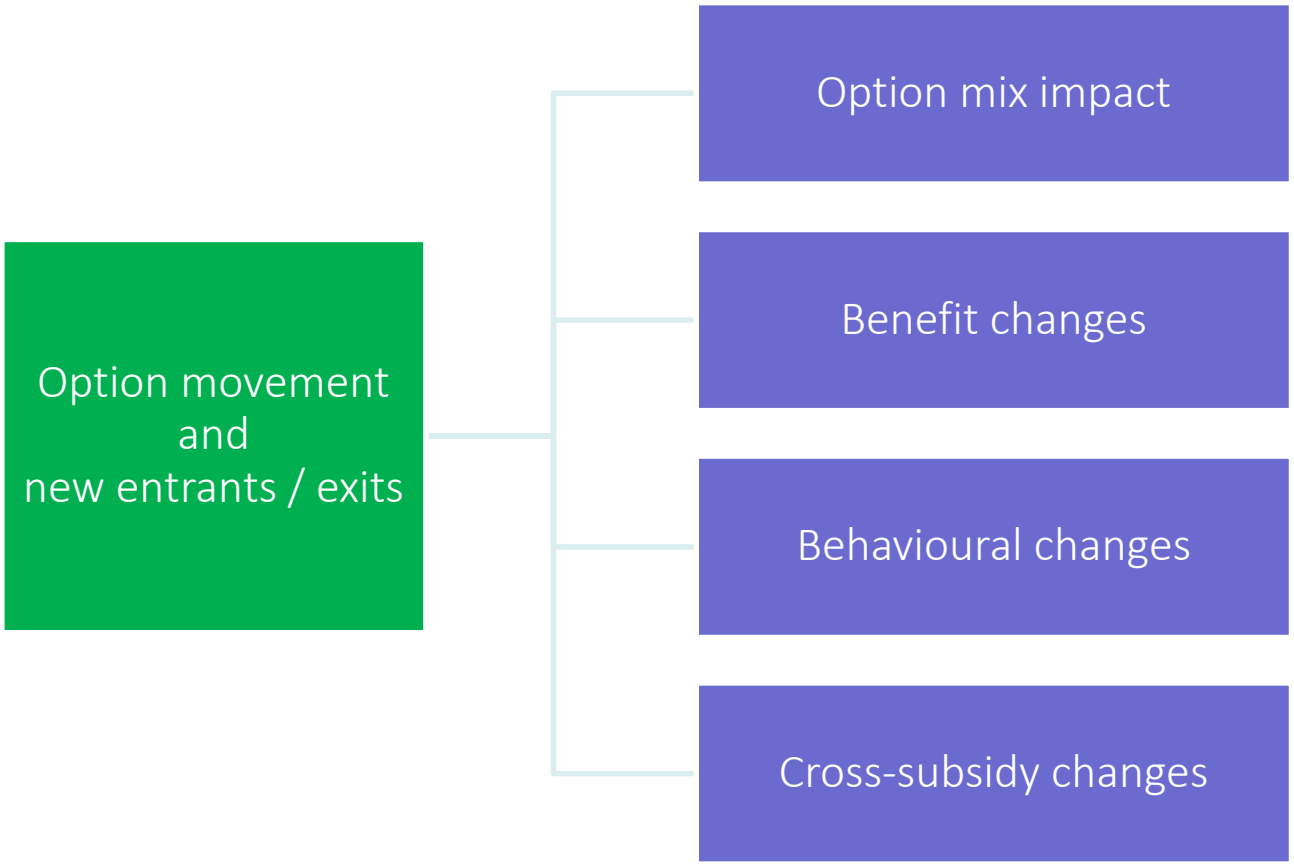
But every option, in isolation, is worse off

Option mix impact illustration

	Membership		Total claims		PLPM claims		Increase
	2014	2015	2014	2015	2014	2015	
Option 1	9 671	11 328	139 262 400	179 435 520	1 200.00	1 320.00	10.00%
Option 2	7 018	8 068	109 480 800	138 446 880	1 300.00	1 430.00	10.00%
Option 3	8 023	9 269	134 786 400	171 291 120	1 400.00	1 540.00	10.00%
Option 4	908	700	16 344 000	13 860 000	1 500.00	1 650.00	10.00%
Option 5	24 065	20 568	490 926 000	461 545 920	1 700.00	1 870.00	10.00%
	51 699	51 948	890 801 614	964 581 455	1 435.87	1 547.35	7.76%

Observed increase in PLPM claims	7.76%
2014 claims weighted by 2015 exposure	1 406.68
2014 claims weighted by 2014 exposure	1 435.87
Option mix effect	2.08%
Increase inclusive of option mix effect	10.00%

More than just option mix



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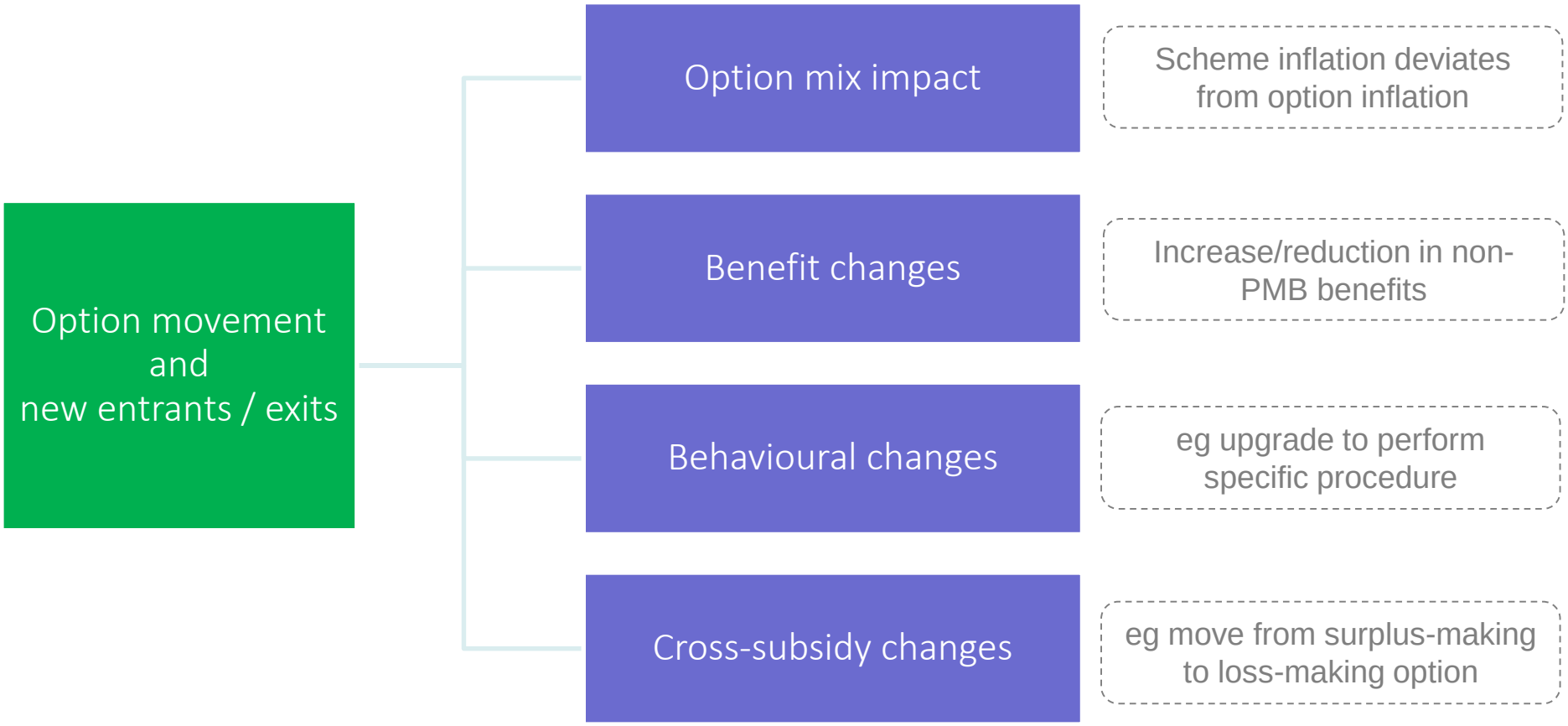


How to price for option selection?

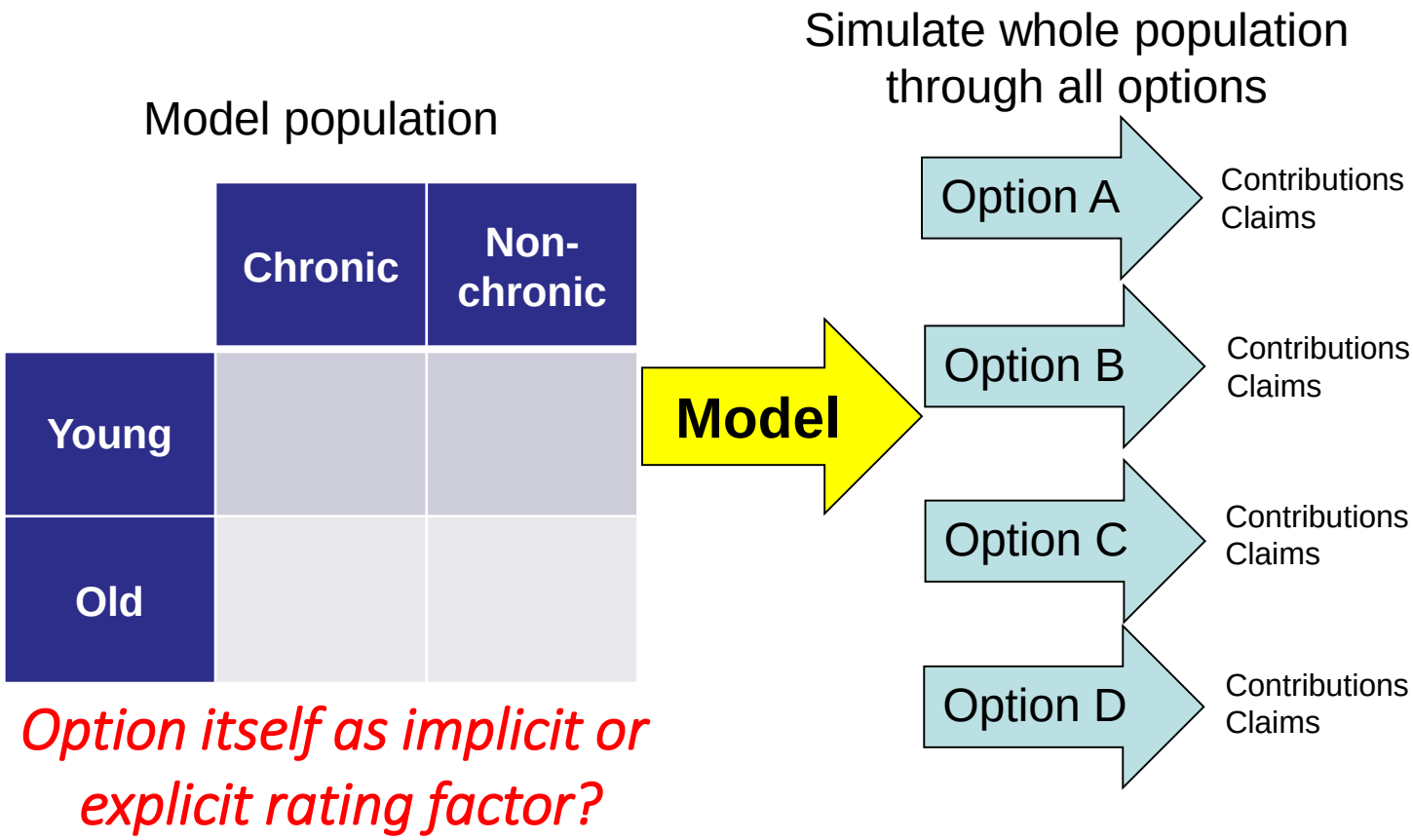
Method favoured by most actuaries is to allow the impact to emerge through utilisation assumptions

This approach is sound but does not facilitate scenario modelling

Scenario modelling requires separate simulation of contributions and benefits (including benefit changes)

…as well as consideration of behavioural changes after an option change

Pricing for option changes



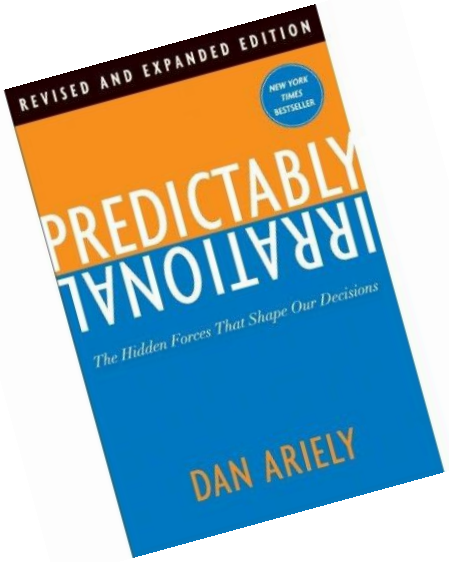
Option itself as implicit or explicit rating factor?

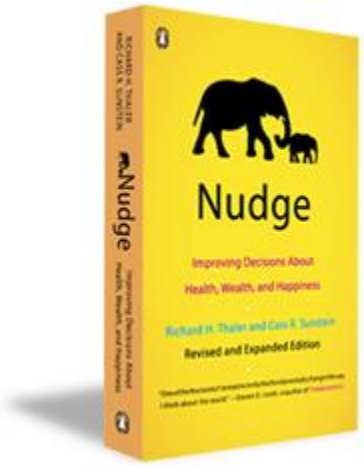
Option selection grids

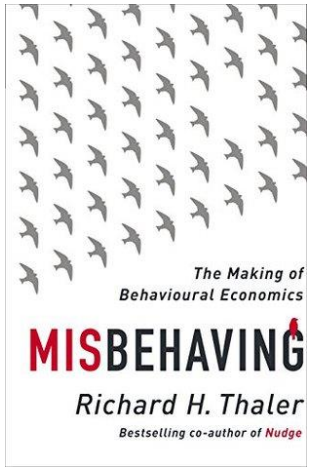
		Option A	Option B	Option C	Option D
Young, chronic	**Option A**	100%			
	Option B		100%		
	Option C			100%	
	Option D				100%
		Option A	**Option B**	**Option C**	**Option D**
Old, chronic	**Option A**	100%			
	Option B		100%		
	Option C			100%	
	Option D				100%
		Option A	**Option B**	**Option C**	**Option D**
Young, non-chronic	**Option A**	100%			
	Option B		100%		
	Option C			100%	
	Option D				100%
		Option A	**Option B**	**Option C**	**Option D**
Old, non-chronic	**Option A**	100%			
	Option B		100%		
	Option C			100%	
	Option D				100%

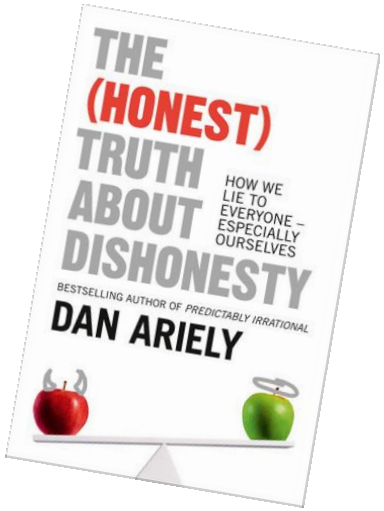
Option selection grids

		Option A	Option B	Option C	Option D
Young, chronic	**Option A**	100%			
	Option B		100%		
	Option C			100%	
	Option D				100%
		Option A	**Option B**	**Option C**	**Option D**
Old, chronic	**Option A**	100%			
	Option B		100%		
	Option C			90%	10%
	Option D				100%
		Option A	**Option B**	**Option C**	**Option D**
Young, non-chronic	**Option A**	100%			
	Option B	15%	85%		
	Option C	5%	5%	90%	
	Option D			5%	95%
		Option A	**Option B**	**Option C**	**Option D**
Old, non-chronic	**Option A**	100%			
	Option B		100%		
	Option C			100%	
	Option D				100%





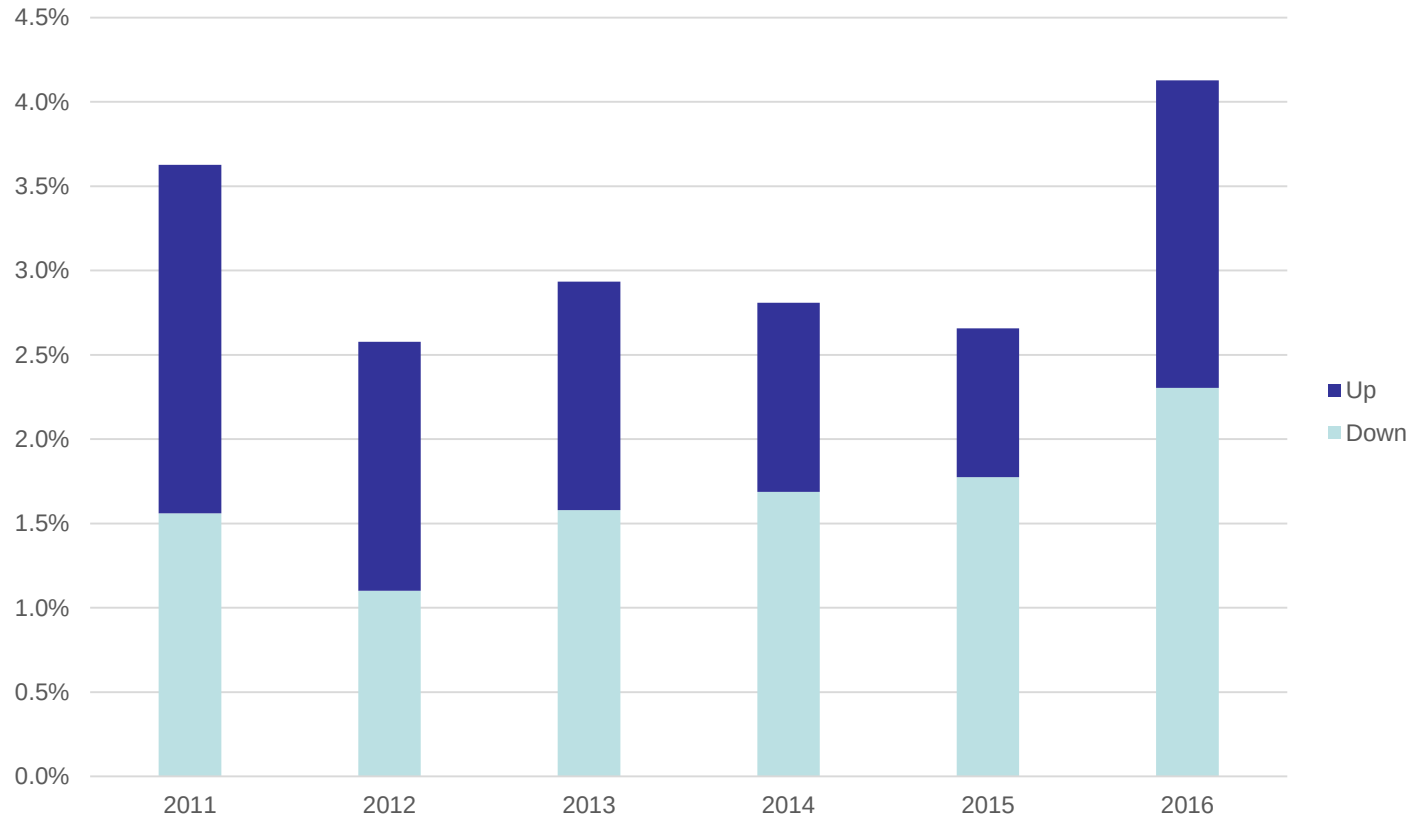




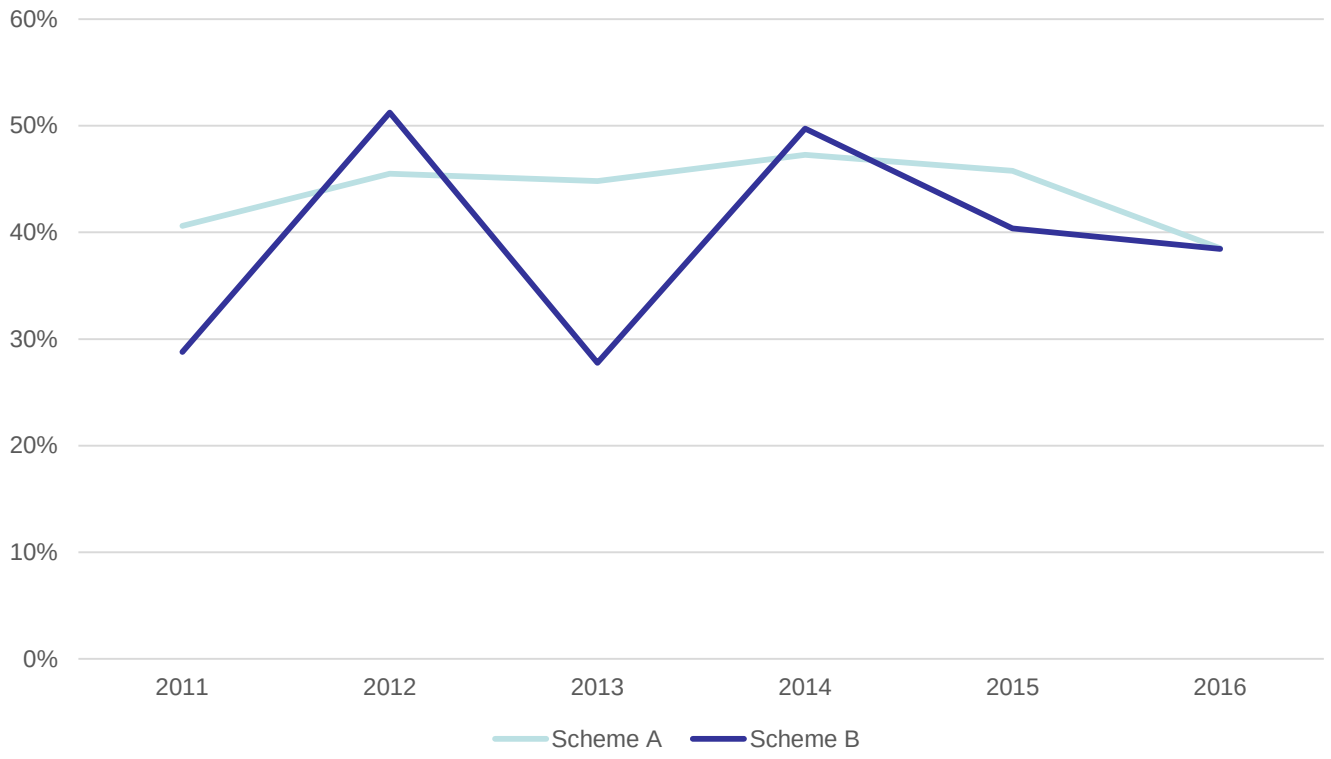
Conventional actuarial modelling tends to consider behavioural changes only implicitly

…if at all

Percentage of option changes per year

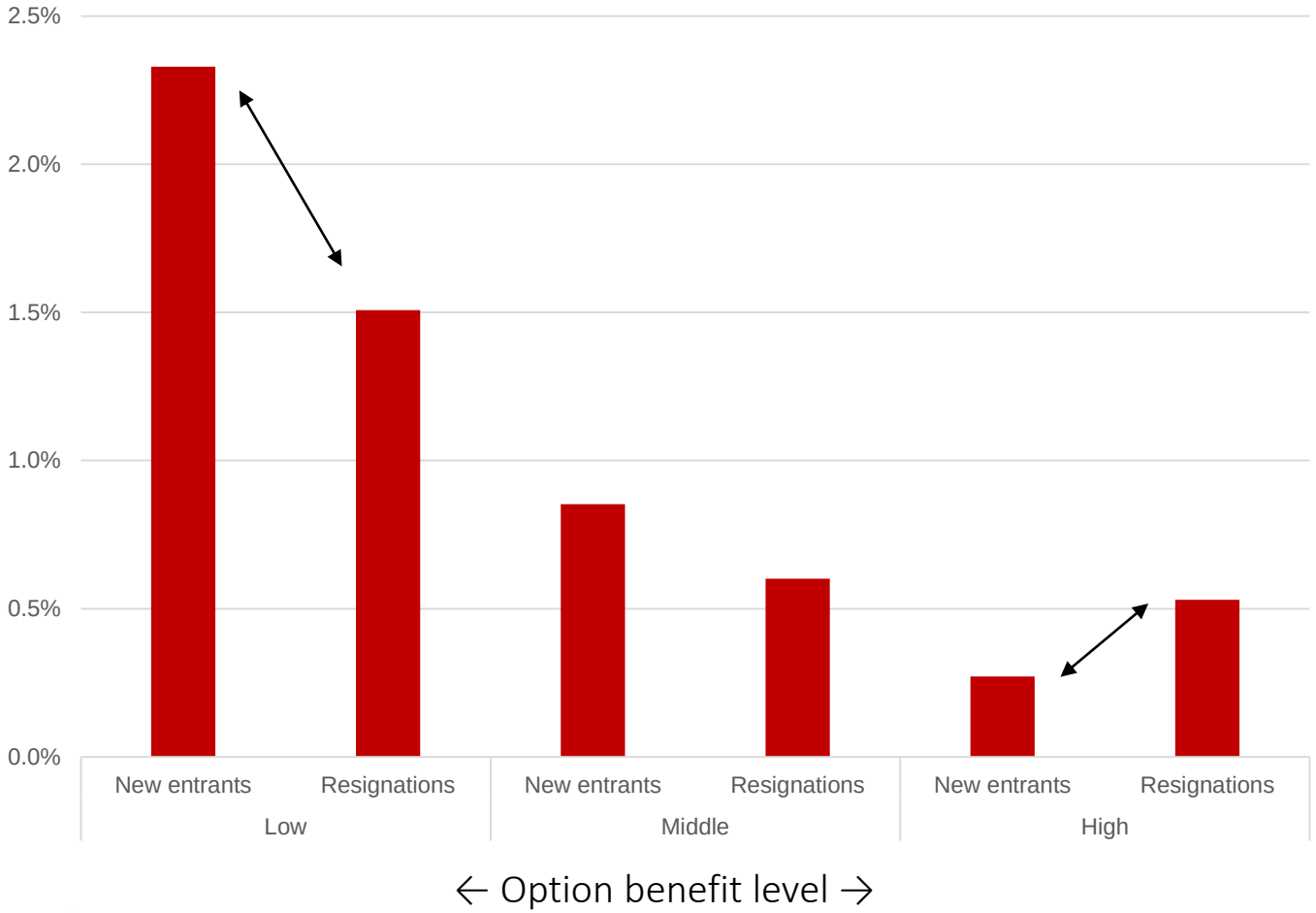


Percentage of option changes that upgraded



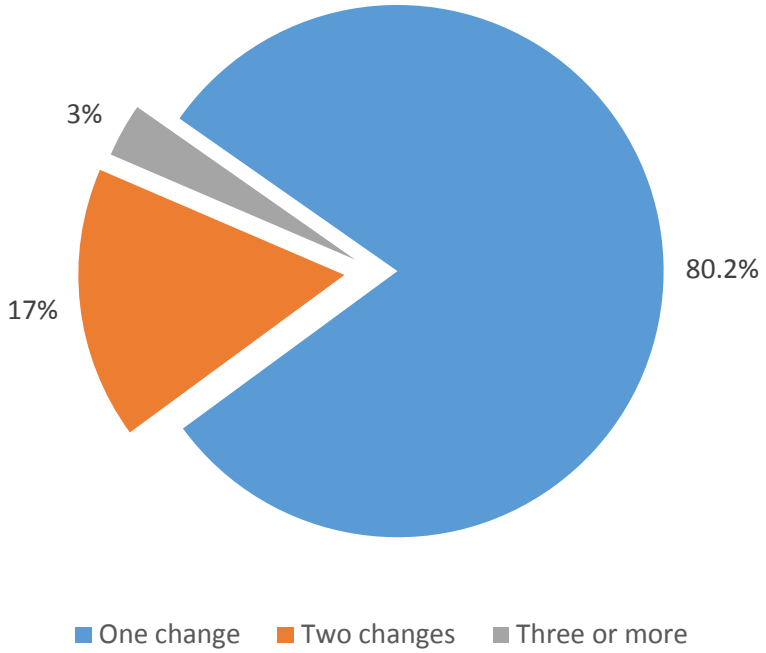
Scheme B has a culture of significant annual product changes
This could explain the more haphazard pattern

Member churn contributing to option mix



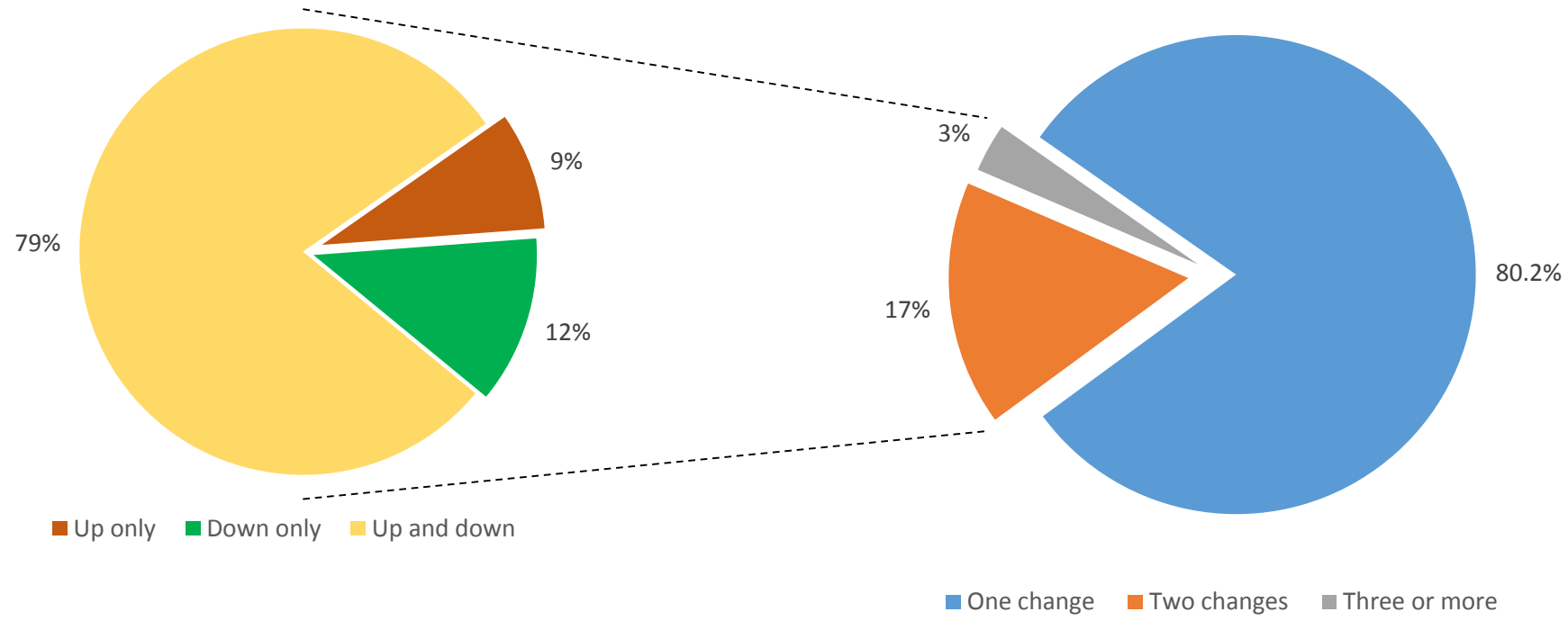
New entrants are more prevalent than withdrawals in low-level options, and vice versa

Multiple changes over a seven-year period



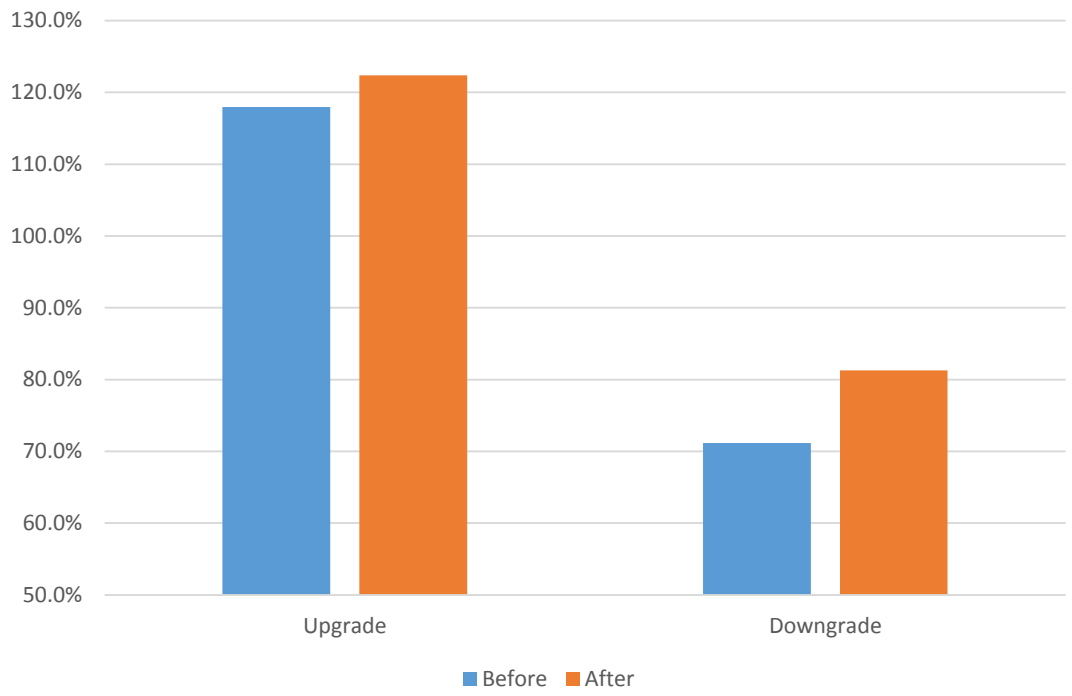
20% of movers changed more than once during this period
The remaining 80% changed only once during this period (and remained in target option for at least three years)

Multiple changes within seven years



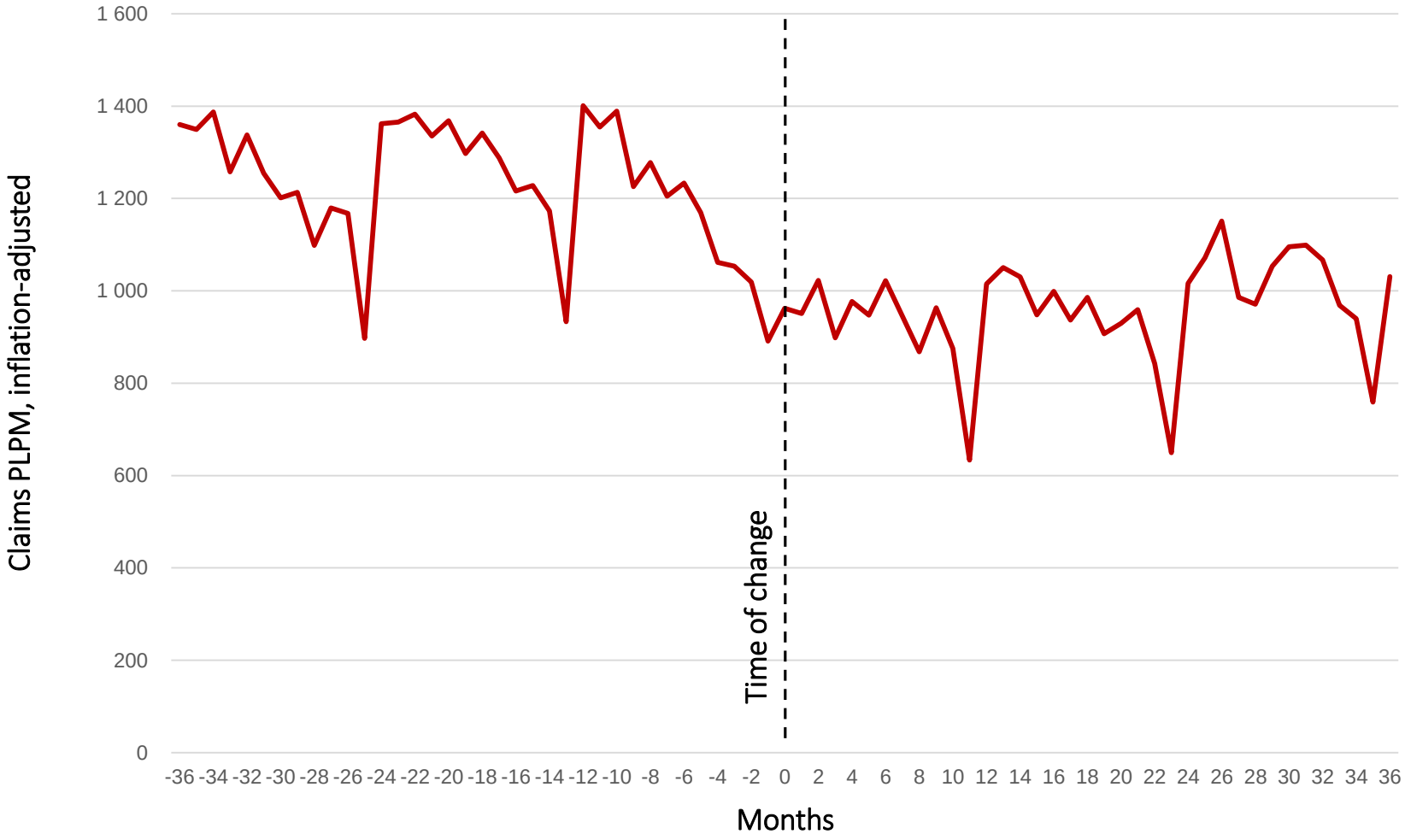
Of the 20% that moved more than once, the majority (79%) performed a mix of upgrades and downgrades
12% persistently downgraded and 9% persistently upgraded

Impact on loss ratio in 1st year after change

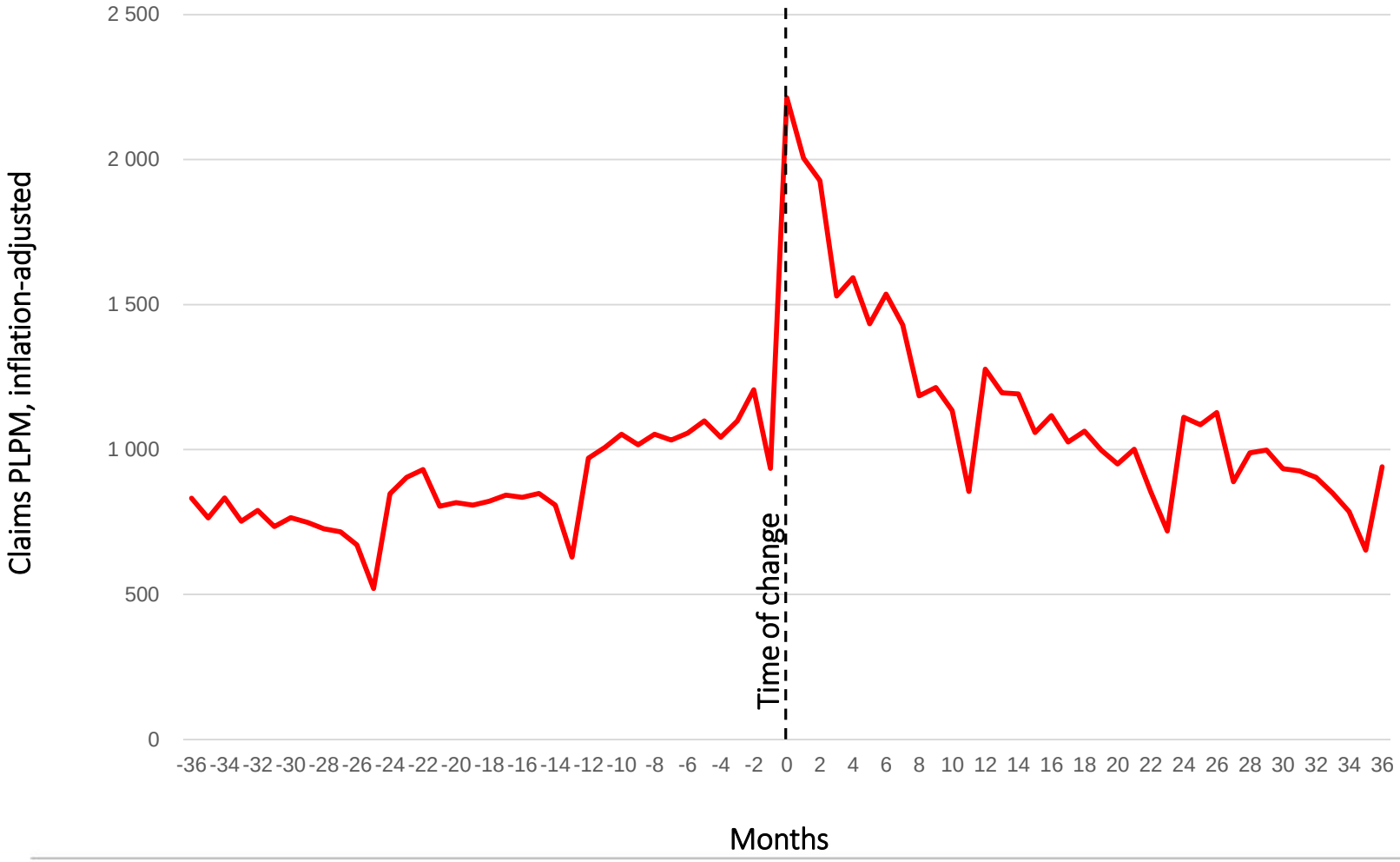


Both upgrades and downgrades leave a scheme worse off
This reflect the reason for up(down)grading rather than product design

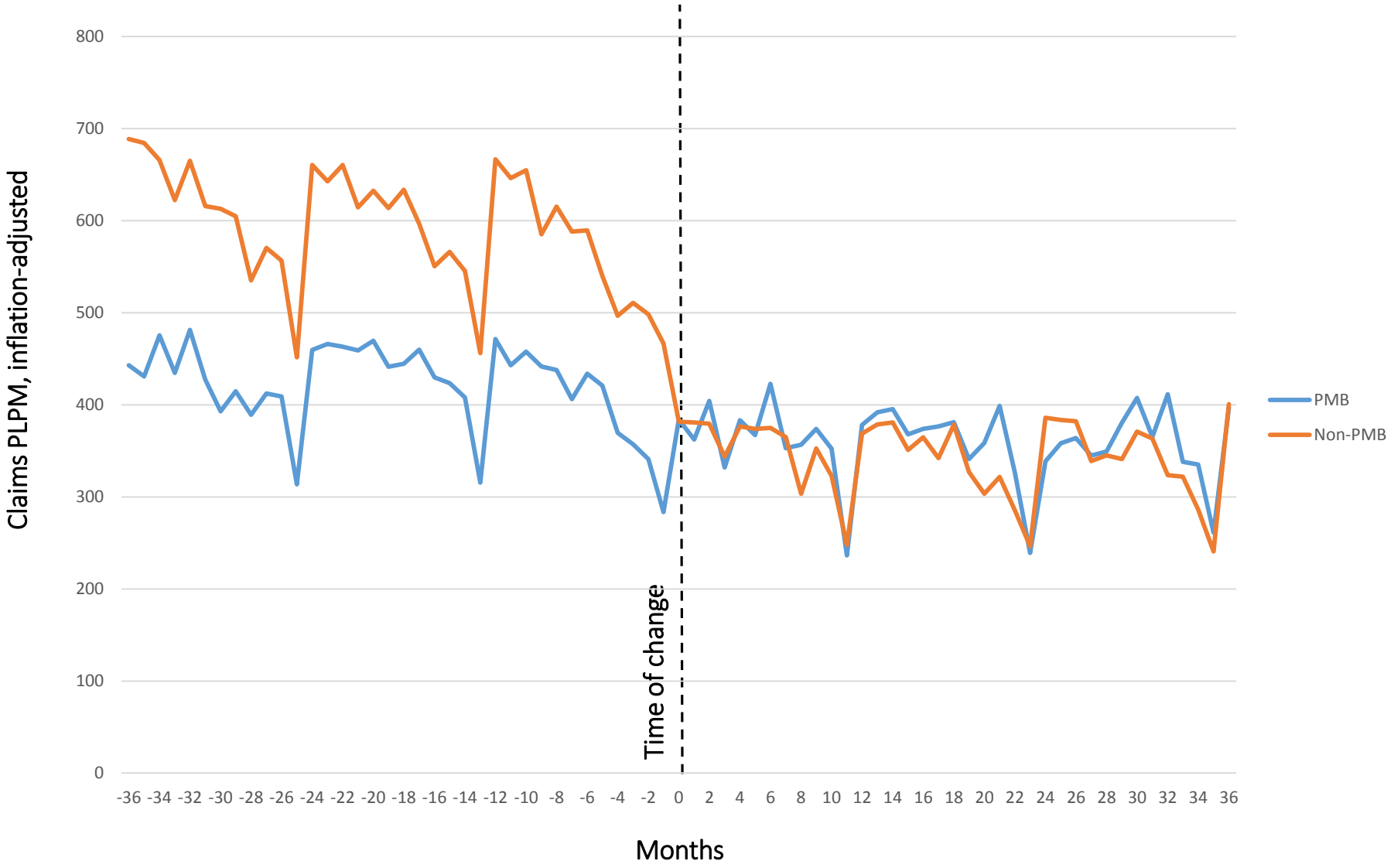
Downgrades


Claims PLPM, inflation-adjusted
1 600
1 400
1 200
1 000
800
600
400
200
0
Time of change
-36 -34 -32 -30 -28 -26 -24 -22 -20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36
Months

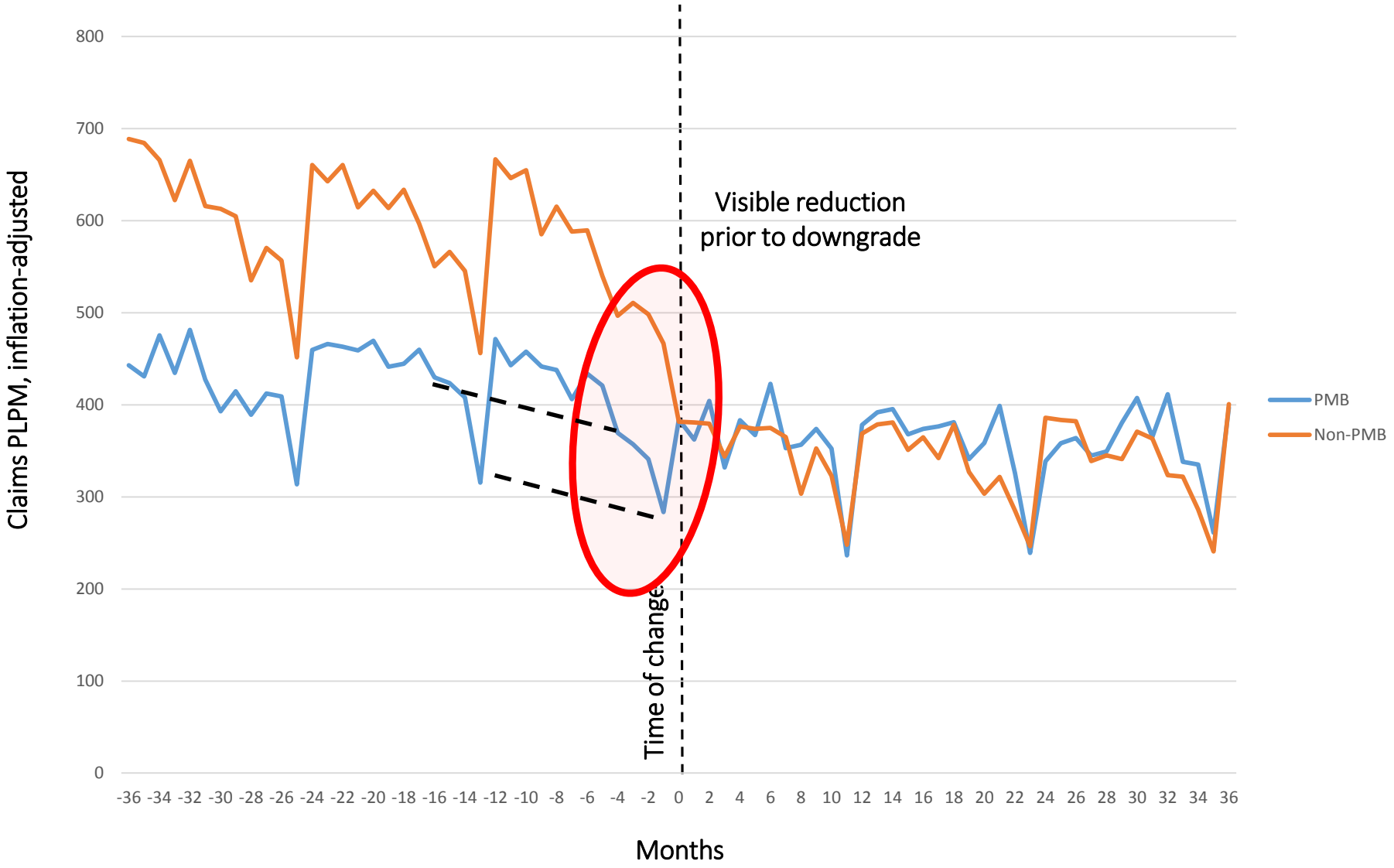
Upgrades


Claims PLPM, inflation-adjusted
2 500
2 000
1 500
1 000
500
0
Time of change
-36 -34 -32 -30 -28 -26 -24 -22 -20 -18 -16 -14 -12 -10 -8 -6 -4 -2 0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36
Months

Downgrades (PMB vs non-PMB)



Downgrades (PMB vs non-PMB)



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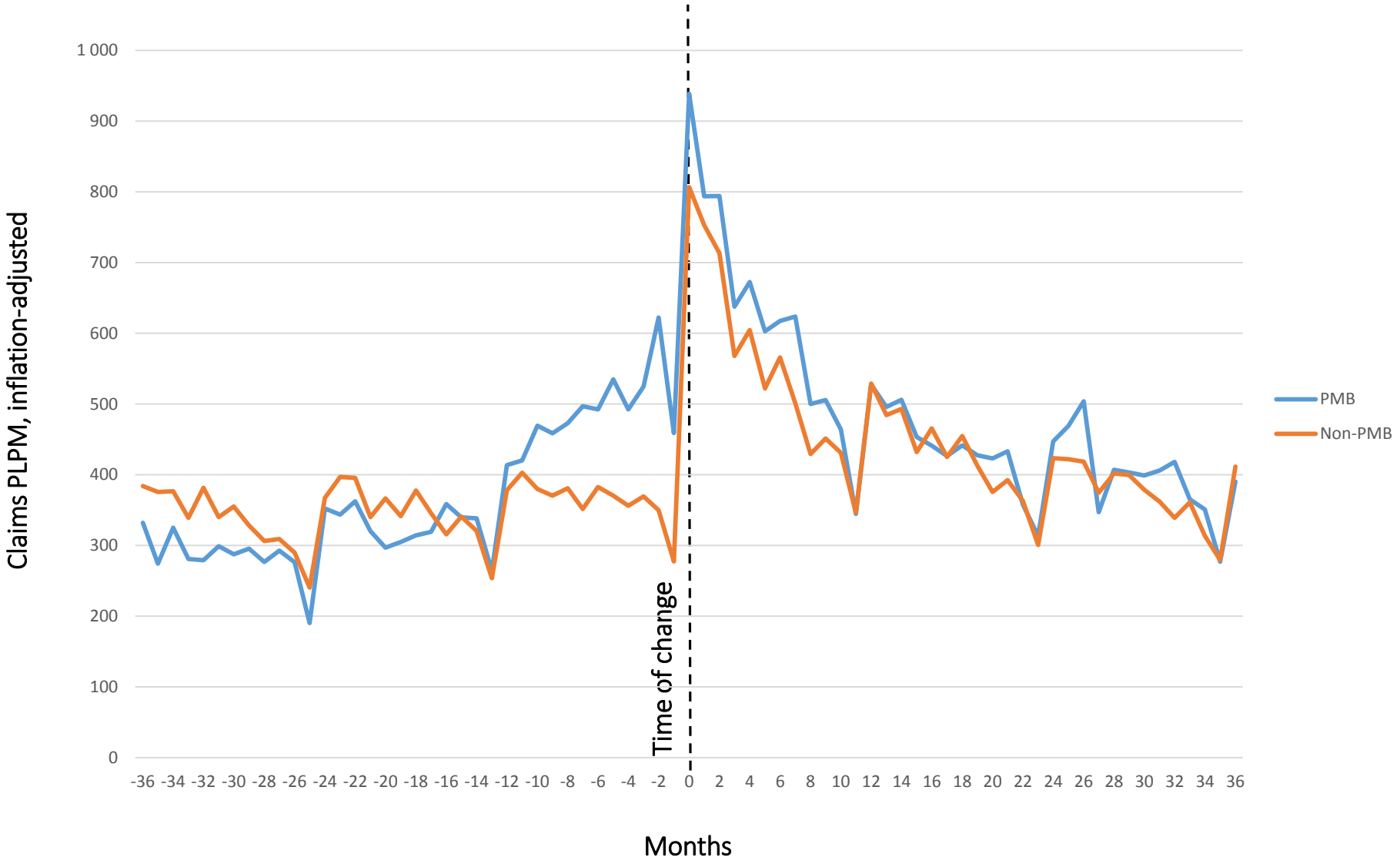

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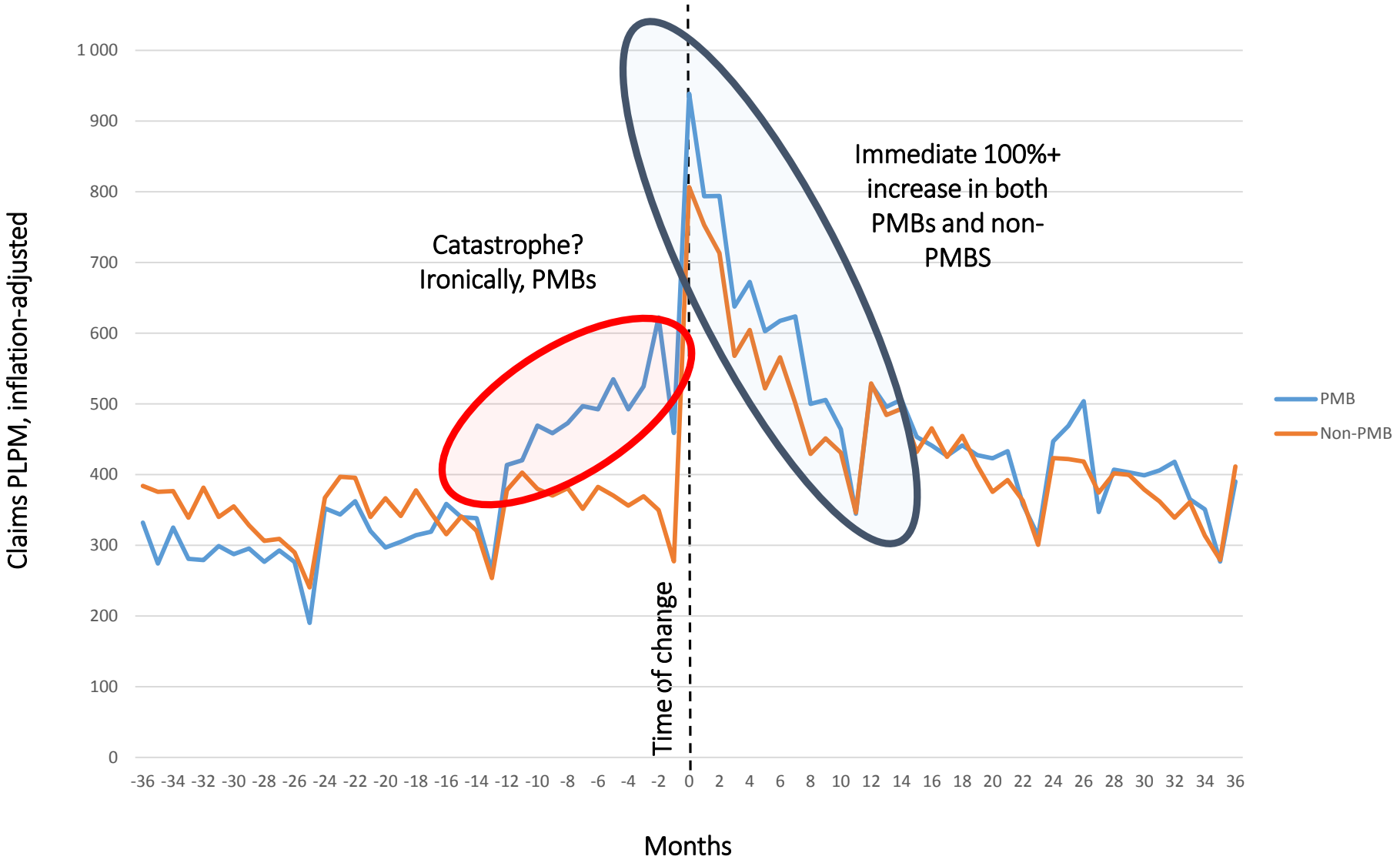
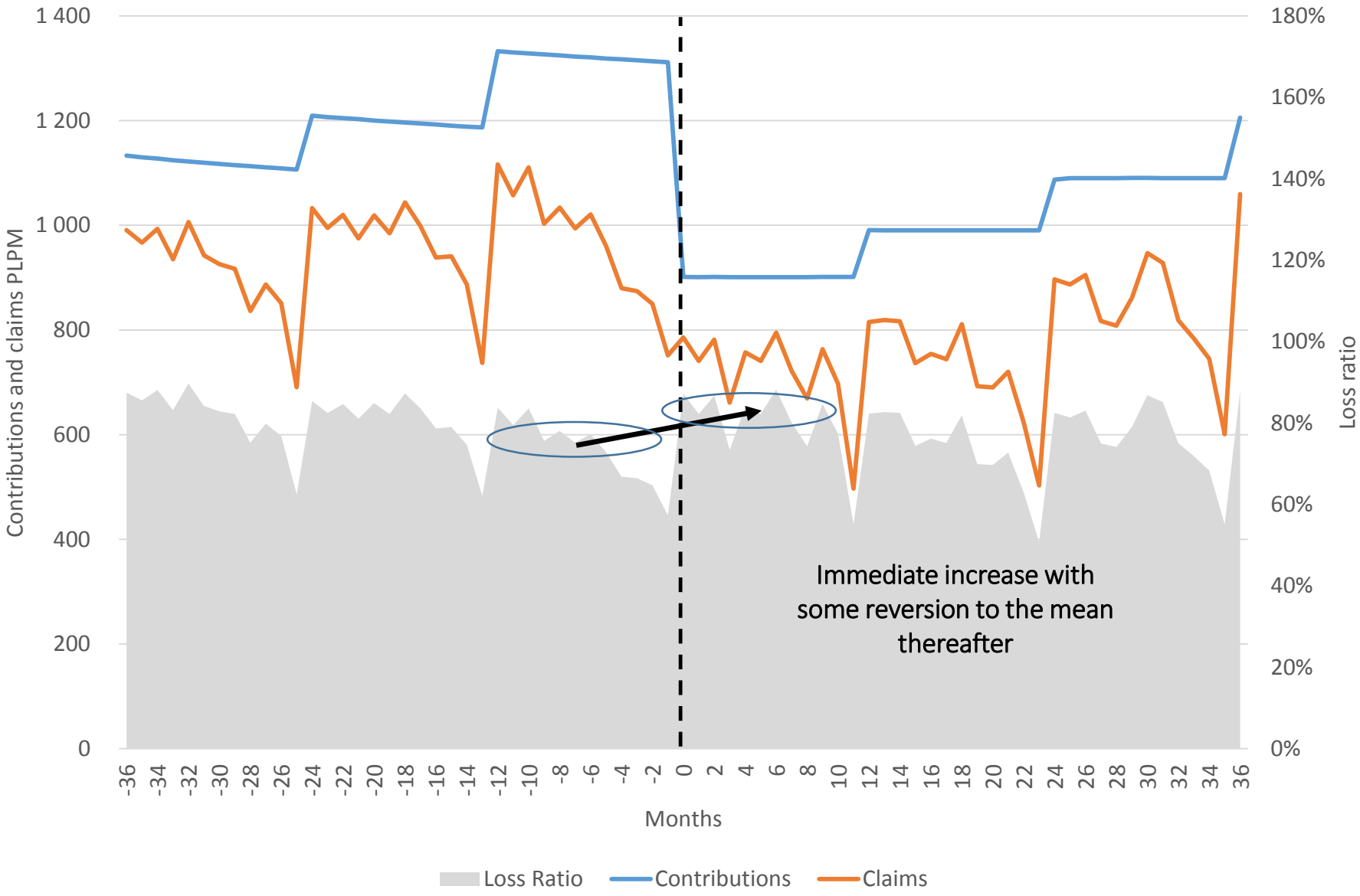
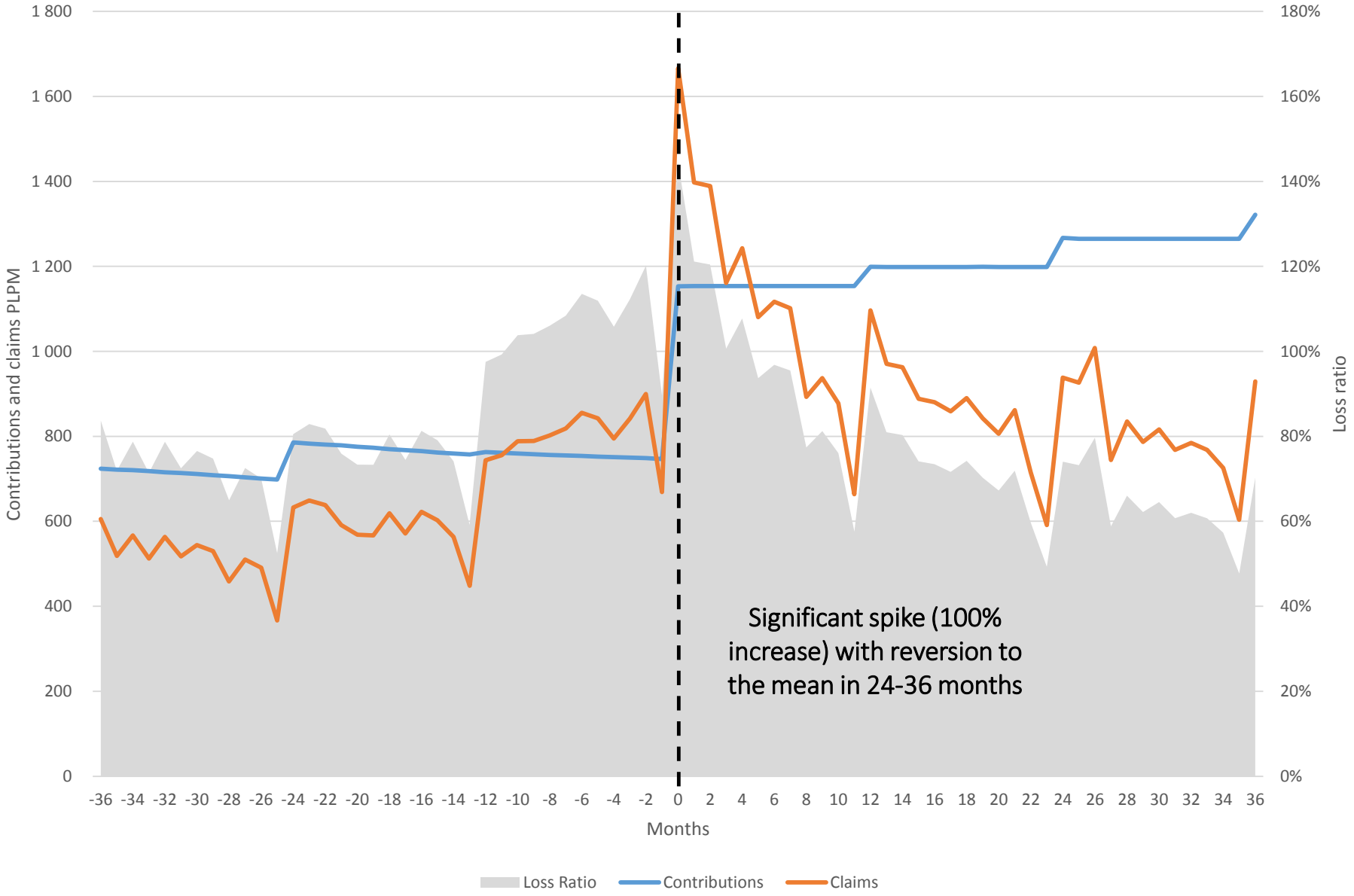


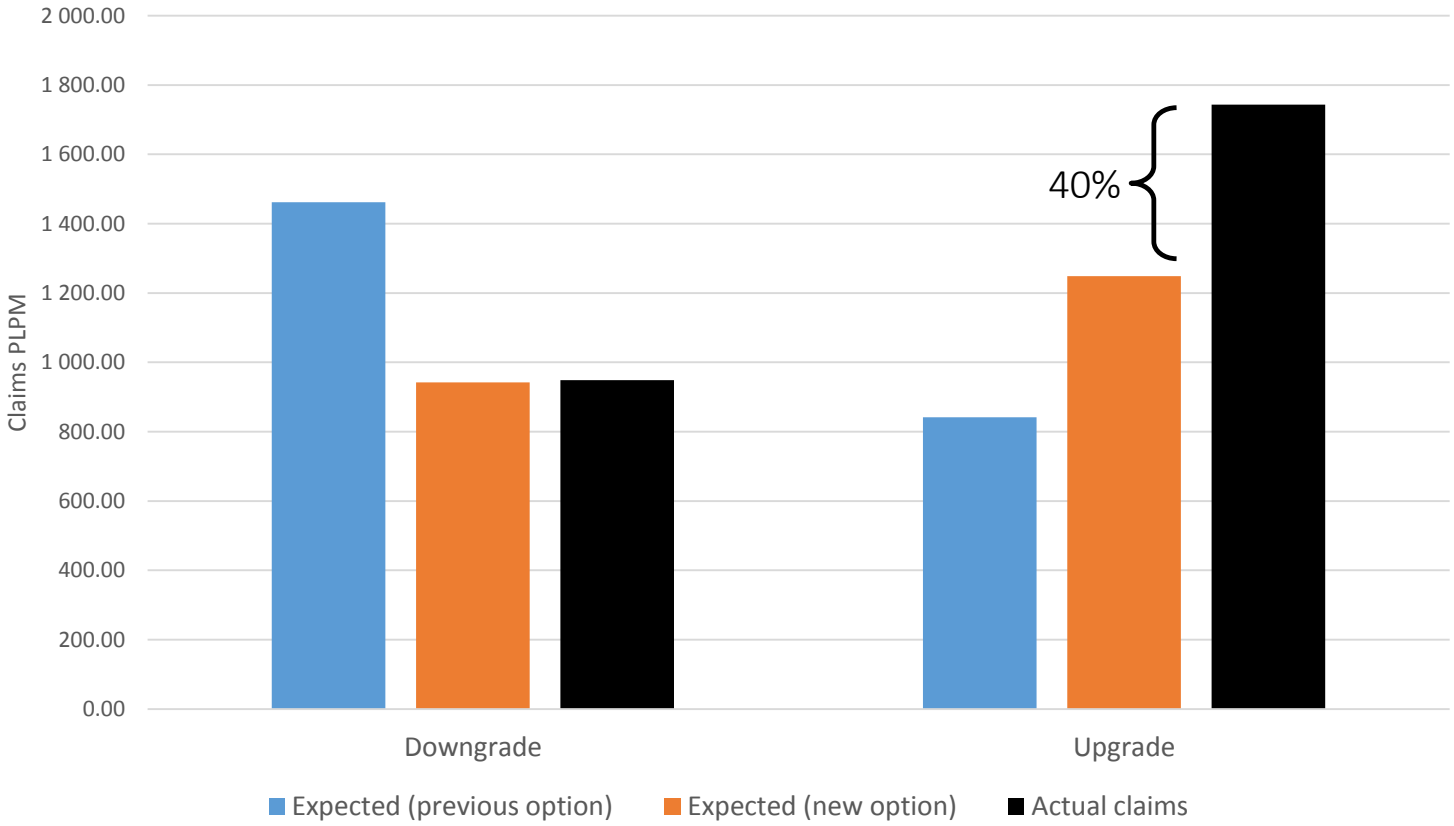
Downgrades - loss ratios



Upgrades – loss ratios



Projecting claims in 1st year after downgrade/upgrade



Conclusion

1. In the short term, both upgrades and downgrades serve to impact negatively on loss ratios
2. Significant product design changes appear to prompt members to reconsider and change options
3. Approximately 80% of option movements stay where they are or continue to move in the same direction
4. Rational and informed consumers that select aggressively against a scheme could cause significant damage, but some degree of inertia or apathy apparently prevents this from happening

Conclusion

5. **Downgrades** are predominantly driven by affordability more than pure anti-selection
6. **Upgrades** are predominantly driven by occurrence of a planned or unplanned health event
7. To a limited degree, upgrades are preceded by an observable increase in (mainly PMB-related) claims in a few months prior to the upgrade
8. To a lesser degree, downgrades are preceded by a reduction in both PMB and non-PMB claims.
9. **These observations could facilitate more accurate prediction of potentially imminent upgrades or downgrades**

Conclusion

10. Causality cannot necessarily be derived from correlation. Does the health event cause the upgrade, or does the upgrade give rise to the health event? Probably a bit of both.

11. Regardless, the conventional wisdom that mid-year upgrades should be resisted appears to remain financially prudent

Conclusion

12. Beneficiaries that downgrade claim roughly in line with the risk-adjusted claims of their peers in the new option
    (and significantly lower than the previous option)
13. Beneficiaries that upgrade claim roughly 40% higher than the risk-adjusted claims of their peers in the new option in the 1st year
    (and significantly higher than the previous option)

14. In the long term, upgrades' risk-adjusted claims revert to risk-adjusted levels observed in the new option

15. In the modelling of amalgamations, this means that the risk-adjusted claims of options in a "recipient scheme" should provide a credible basis for the projection of amalgamating beneficiaries' claims

ONE DOES NOT SIMPLY GO TO A HEALTH CPD DAY
AND GET POINTS JUST FOR ATTENDING
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Thank you