A statistical model for NZ Beer Market Shares

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SAMPLE PROJECT

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Agenda

Can launching Amstel help DB Breweries compete against Stella Artois?

Build a statistical model to determine its impact on Market Shares of key players

- Introduction
  - Background
  - Research Scope
  - Methodology
- Insights
  - Impact on DB Market Share
  - Price Sensitivity
  - Impact on other Brands
- Conclusions
  - Overall conclusions
  - Next Steps

Background

Current Market

- Country: New Zealand
- Product & Segment: Premium Beer
- Key Players & Brands
  - Client **DB Breweries** (DB) markets 1 premium beer brand **Heineken** (HN)
  - Competitor **NZ Breweries** (NZB) markets 2 premium beer brands - **Steinlager** (SN) and **Stella Artois** (SA).
  - SA is the more influential competitor than SN

Marketing Objectives

- Should DB launch a 2nd premium brand Amstel (AM)?
  - To compete on a more 'equal footing'
  - Especially against SA
- Will it help DB increase its overall market share?
- What will be Amstel's impact on existing DB Brands?
  - premium brand Heineken (HN)
  - mainstream brand DB Export Gold (XG).

Research Scope

Research Objectives

- Will Amstel help DB increase its overall market share and revenue in the premium beer segment?
- How do the 4 premium brands react to each other's prices?
  - Amstel , Heineken, Stella Artois & Steinlager
- How will Amstel affect the share of own brands:
  - Heineken?
  - DB Export Gold?
- Will it take share away from:
  - other premium beer?
  - other 'mainstream' beer?
- How does Heineken affect the share of DB Export Gold?

Key Assumptions

- Examine the effects based on
  - Price
- Other factors to be assumed constant
  - All brands have equal marketing and distribution
  - Consumers are equally aware of all brands (price, features, etc.)
  - No promotions other than the combination of prices offered
- Consumer Survey based on Premium Beer Drinkers

Methodology

Choice Modelling	• Model the effect of price on consumer choice based on consumer survey responses • Each survey respondent examines a number of price scenarios and choose which beer they would purchase.
100% efficient Experimental Design	• Measure what we want to measure with minimum data and error • Helped produce 27 choice sets out of 243 possible combinations • Each Choice set tells something new and significant – i.e. the design is orthogonal
27 Choice Sets	• Minimize respondent fatigue without compromising effectiveness • Measure non linear price effects – across 3 price levels • Included 3 second order price effects i.e. effect on market share of other brands' prices
The Survey & The Model	• 200 valid responses from premium beer drinkers • Multinomial Logit model computes Price Utility of various brands based on responses • Comparing Utility of a brand to the rest gives probability of choice i.e. market share
Interactive Decision Tool	• Allows you to select any combination of price and brand to view its effects on others • Excel based so easy to use and customise

The Selected Design

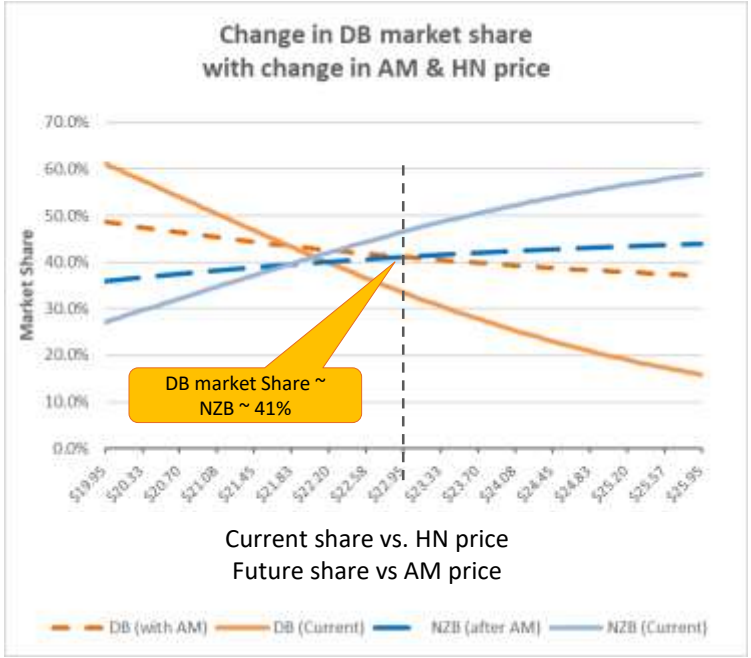
- 3 price points to capture non-linear effects
  - The effect of price on market share is usually not the same (linear) across the price range, It may decline rapidly at some stage and then stabilise like a curve.
- Focus on 3 brands to study second order effects i.e. effect on market share due to a change in price of other brands
  - Amstel & Stella Artois (AM & SA)
  - Amstel & Heineken (AM & HN)
  - Heineken & Stella Artois (HN & SA)

Beer Brand	Price Levels to be studied		
	Low	Medium	High
Amstel (AM), Heineken (HN), Stella Artois (SA), Steinlager (SN)	$19.95	$22.95	$25.95
DB Export Gold (XG)	$15.95	16.95	$17.95
Other Premium	n.a.	$19.95	n.a.
Other Mainstream	n.a.	$15.95	n.a.

Note: Please refer to Technical Appendix for more details

Questionnaire Sample:

DB can improve competitiveness with AM launch



Current share vs. HN price
Future share vs AM price

Price of all other brands = Med

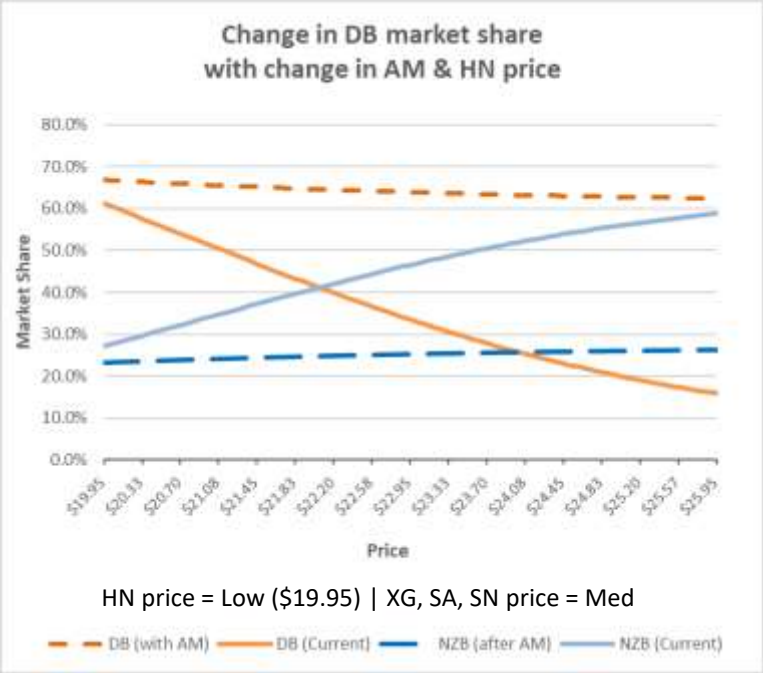
Price sensitivity of DB market share declines by adding AM to its portfolio

- Current DB share (solid orange line) falls steeply as price of HN is raised.
- With addition of AM (dashed line), the slope is much flatter
- It retains leadership position until a medium price (approx. $22.95) for both HN and AM

To Maximise Revenue

- Keep price of both AM and HN around medium price

More levers in DB's pocket by launching AM



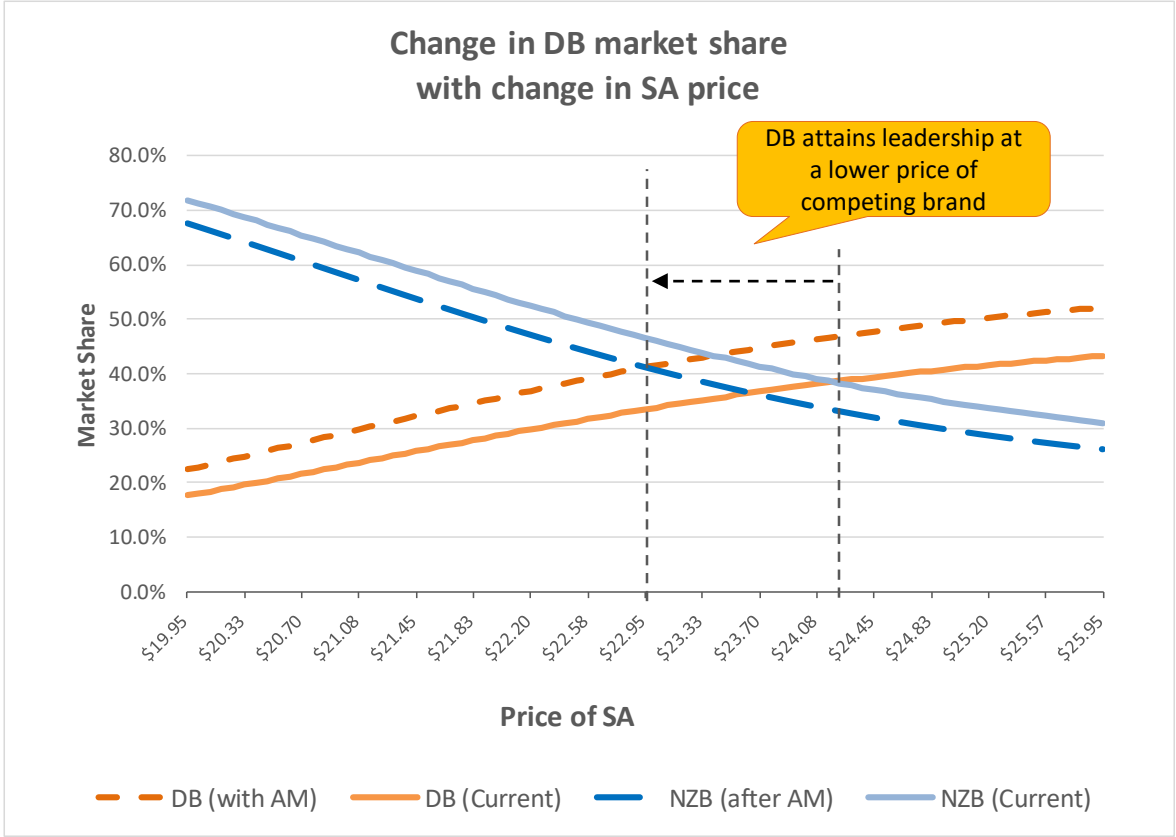
Alternatively, to Maximise Market Share

- If HN price is kept at low, DB can stay a market leader across the price range of AM
- Use AM for profitability while price HN for competitiveness

Overall, DB has more levers in its pocket by introducing AM in its portfolio

Impact of SA prices on DB

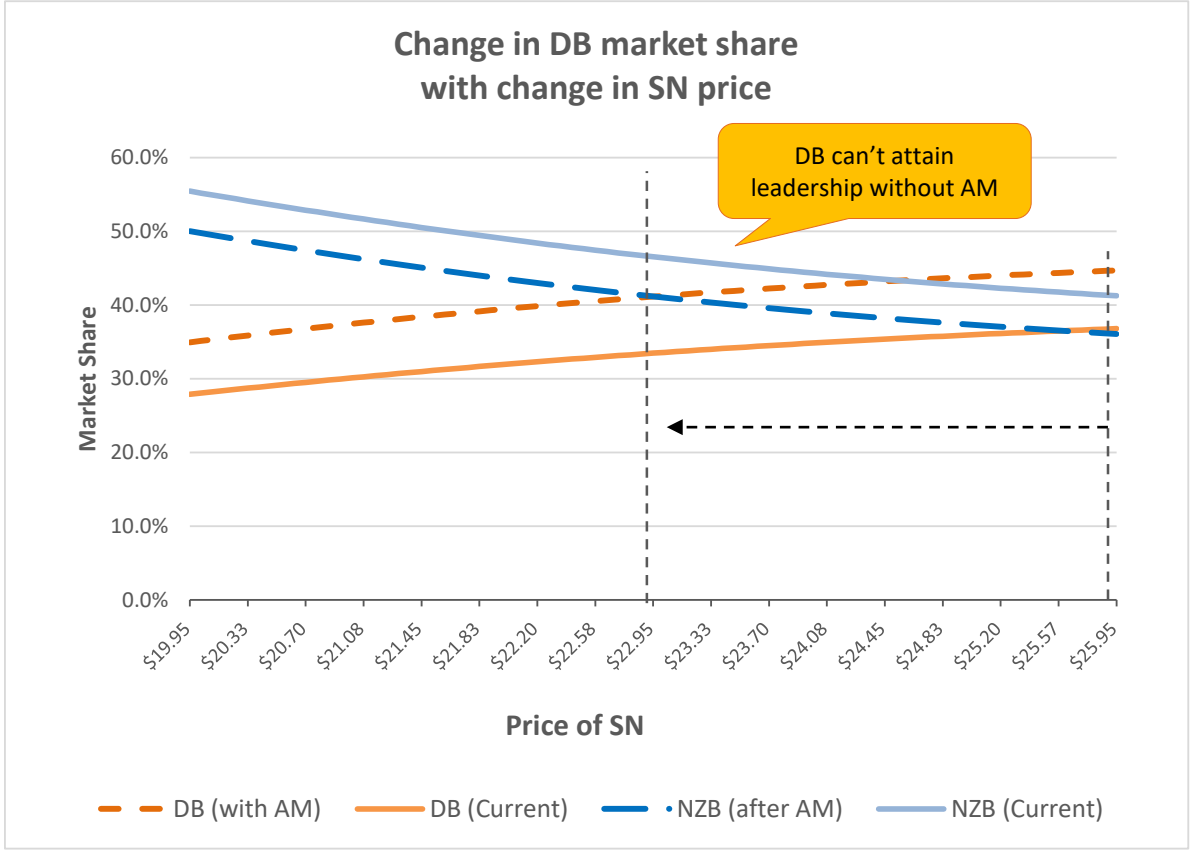
- AM increases DB market share across all price ranges of SA
- DB gets market leadership position at medium to high prices of SA
- NZB will have to keep low prices of SA to attain market leadership



Price of all other brands = Med

Impact of SN prices on DB

- In the chart the solid lines never meet
  - Indicates that without AM, DB can't achieve market leadership across the price range of Steinlager (SN)
- With launch of AM, DB can achieve leadership for medium to high prices of SN



Price of all other brands = Med

Overall Conclusions

Research Question	Conclusion
Will Amstel help DB increase its overall market share and revenue in the premium beer segment?	Yes, AM gives more levers to DB to either maximise revenue or market share. • Attain market leadership and maximise revenue at Medium Price level • Market leader position at Low to Medium price level. • AM takes away share mostly from SA and SN.
How do the 4 premium brands react to each other's prices?	• Overall, a highly price sensitive market. • SA and SN are more sensitive to AM prices than HN and XG. • Use IDT tool to evaluate different combinations of price levels by brand.
How will Amstel affect the share of own brands?	• Heineken – Negligible. • DB Export Gold – Negligible. Premium isn't the primary market for XG, hence, no significant impact on total volume & revenue.
Will Amstel take share away from others?	AM takes away share mostly from SA and SN. other premium beer – Yes. other 'mainstream' beer – Yes their market share decreases in premium segment.
How does Heineken affect the share of DB Export Gold?	Both address different segments, hence very low exposure of XG in premium segment. Share of XG in premium segment increases with increase in price of Heineken.

Next Steps

- Incorporate feedback from DB
- Survey can be extended to:
  - specific regions
  - different points of sale e.g. Pubs vs Liquor Stores
- If required, evaluate positioning and distribution points for test market

Technical Appendix

Key Stats

Testing Global Null Hypothesis: BETA=0			
Test	Chi-Square	DF	Pr > ChiSq
Likelihood Ratio	4981.4087	12	<.0001
Score	5792.5359	12	<.0001
Wald	3931.5517	12	<.0001

- Multinomial Logit Model was used to determine impact of prices on consumer choice
- The model cleared statistical tests
  - Hypothesis Tests indicated that impact of prices on consumer choice were Statistically significant
  - Quadratic terms were discarded by the model

- How were Market Shares estimated?
  - The model gives us constants to calculate utility of a brand by price
  - The Utility for a given brand = exp(XB)
  - Probability of Choice = Utility of the brand / Sum of Utility for all brands
- Market Shares = Probability of Choice

Model Summary

Analysis of Maximum Likelihood Estimates					
Parameter	DF	Parameter Estimate	Standard Error	Chi-Square	Pr > ChiSq
HN	1	11.28593	0.34907	1045.2920	<.0001
SN	1	7.43800	0.40478	337.6579	<.0001
SA	1	12.51223	0.36532	1173.0905	<.0001
XG	1	8.38303	1.72084	23.7314	<.0001
AM	1	6.58789	0.63240	108.5210	<.0001
MP	1	1.28826	0.08563	226.3528	<.0001
OTH	0	0	.	.	.
PR_HN	1	-0.40769	0.01544	697.1617	<.0001
PR_SN	1	-0.26598	0.01807	216.6710	<.0001
PR_SA	1	-0.46051	0.01620	808.4871	<.0001
PR_XG	1	-0.50303	0.10338	23.6759	<.0001
PR_AM	1	-0.27314	0.01990	188.3456	<.0001
SA_AM	1	0.03416	0.01970	3.0049	0.0830

The Choice Sets

- Used Experimental Design to select 27 choice sets
  - To minimise respondent fatigue and maximise cost efficiency
  - If we included all possible choices - across 5 brands, there would be 243 different choice sets

- Key features
  - Captured 3 price levels so that we can capture changes in effect by price level
  - Were able to capture quadratic effects.
  - The choice sets were orthogonal i.e. no correlation between the sets
  - Efficient in Measuring price effects we want to measure

Choice Set	HN	AM	SN	SA	XG
1	$ 25.95	$ 25.95	$ 25.95	$ 25.95	$ 22.95
2	$ 25.95	$ 25.95	$ 22.95	$ 22.95	$ 25.95
3	$ 25.95	$ 25.95	$ 19.95	$ 19.95	$ 19.95
4	$ 25.95	$ 22.95	$ 25.95	$ 22.95	$ 19.95
5	$ 25.95	$ 22.95	$ 22.95	$ 19.95	$ 22.95
6	$ 25.95	$ 22.95	$ 19.95	$ 25.95	$ 25.95
7	$ 25.95	$ 19.95	$ 25.95	$ 19.95	$ 25.95
8	$ 25.95	$ 19.95	$ 22.95	$ 25.95	$ 19.95
9	$ 25.95	$ 19.95	$ 19.95	$ 22.95	$ 22.95
10	$ 22.95	$ 25.95	$ 25.95	$ 22.95	$ 19.95
11	$ 22.95	$ 25.95	$ 22.95	$ 19.95	$ 22.95
12	$ 22.95	$ 25.95	$ 19.95	$ 25.95	$ 25.95
13	$ 22.95	$ 22.95	$ 25.95	$ 19.95	$ 25.95
14	$ 22.95	$ 22.95	$ 22.95	$ 25.95	$ 19.95
15	$ 22.95	$ 22.95	$ 19.95	$ 22.95	$ 22.95
16	$ 22.95	$ 19.95	$ 25.95	$ 25.95	$ 22.95
17	$ 22.95	$ 19.95	$ 22.95	$ 22.95	$ 25.95
18	$ 22.95	$ 19.95	$ 19.95	$ 19.95	$ 19.95
19	$ 19.95	$ 25.95	$ 25.95	$ 19.95	$ 25.95
20	$ 19.95	$ 25.95	$ 22.95	$ 25.95	$ 19.95
21	$ 19.95	$ 25.95	$ 19.95	$ 22.95	$ 22.95
22	$ 19.95	$ 22.95	$ 25.95	$ 25.95	$ 22.95
23	$ 19.95	$ 22.95	$ 22.95	$ 22.95	$ 25.95
24	$ 19.95	$ 22.95	$ 19.95	$ 19.95	$ 19.95
25	$ 19.95	$ 19.95	$ 25.95	$ 22.95	$ 19.95
26	$ 19.95	$ 19.95	$ 22.95	$ 19.95	$ 22.95
27	$ 19.95	$ 19.95	$ 19.95	$ 25.95	$ 25.95

Capturing First and Second Order Effects

The choice sets included variation in prices that helped us measure both these effects:

- First order – effect of change in price of the brand itself
- Second order – effect of change in prices of other brands

Assumptions

- A consumer will go for a brand that is cheaper, if he/she likes 2 brands equally.
- Consumer choices don't vary by point of sale e.g. A consumer in a pub could be less price sensitive than a liquor store.

First Order Effect:
Will the consumer still prefer to buy AM, if its price drops?

Brand	Old Price	New Price
AM	$25.95	$22.95
SA	$25.95	No change

Second Order Effect:
Will the consumer still prefer to buy AM, if its price drops?

Brand	Old Price	New Price
AM	$25.95	No change
SA	$25.95	$22.95

Thanks