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TV Product: Bootstrapped Willingness to Pay

Introduction

This report presents the results of a bootstrapped regression analysis used to obtain 95% confidence intervals (CI) for willingness to pay (WTP) for all non-price attribute levels of TV products. The analysis incorporates individual preferences from Team - R, using both residual and data bootstrapping methods to ensure a robust statistical approach.

Methodology

Bootstrap regression is a non-parametric method that allows for estimating the precision of sample statistics by resampling with replacement from the original dataset and calculating the statistic of interest repeatedly. In this analysis, we employ two bootstrapping methods:

Residual Bootstrap

This technique involves generating new datasets by resampling the residuals of a regression model. Here's the process:

- Fit the linear regression model to original data.
- Calculate residuals from the model.
- Create new outcome variables by adding the resampled residuals to the predicted values.
- Re-fit the model to the new datasets to assess the distribution of estimated coefficients.
- Estimate WTP for TV attributes relative to the price attribute.

Data Bootstrap

This method resamples the original data with replacement, creating new samples as follows:

- Generate new datasets by resampling the original data.
- Fit the linear regression model to each new dataset.
- Repeat to accumulate a distribution of coefficients.
- Calculate WTP from these coefficients.

Results

Each team member's preference data was analyzed, yielding the following confidence intervals and mean estimates for WTP across various TV attributes:

Sreeja's Preferences:

Non-price Attributes	Residual Bootstrap Mean	Lower CI	Upper CI	Data Bootstrap Mean	Lower CI	Upper CI
75 Inch Screen	962.0554	626.4675	1467.82	961.9262	585.0896	1566.051
85 Inch Screen	1109.583	727.7821	1687.422	1108.973	690.0931	1816.8
Sony Brand	153.3632	-26.47787	362.4159	146.3255	-64.28408	371.1504
4K Resolution	1311.242	919.1205	1932.184	1313.542	806.4245	2261.972

- Shows a higher WTP for larger screen sizes, with the mean WTP for an 85-inch screen at approximately $1109 (residual bootstrap) and $1108 (data bootstrap).
- Brand value is moderately important with a WTP around $153 for Sony.
- High value placed on 4K resolution with the mean WTP over $1300 for both methods.

Sujai's Preferences:

Non-price Attributes	Residual Bootstrap Mean	Lower CI	Upper CI	Data Bootstrap Mean	Lower CI	Upper CI
75 Inch Screen	611.7676	422.1324	853.6004	614.7052	385.4706	911.0017
85 Inch Screen	1143.176	871.9561	1507.43	1146.955	795.8715	1621.512
Sony Brand	309.4294	178.0157	474.1053	305.6599	157.3863	457.079
4K Resolution	813.8702	610.0288	1083.902	821.0886	559.3812	1186.548

- Values larger screens with a significant increase in WTP for an 85-inch screen compared to a 75-inch screen.
- Brand value for Sony is notably higher than Sreeja's at approximately $309 (residual) and $305 (data).
- Places a high value on 4K resolution, but less than Sreeja, with a mean WTP around $813 (residual) and $821 (data).

Krittika's Preferences:

Non-price Attributes	Residual Bootstrap Mean	Lower CI	Upper CI	Data Bootstrap Mean	Lower CI	Upper CI
75 Inch Screen	444.1193	351.1538	549.8505	451.3213	318.1439	609.7349
85 Inch Screen	558.6419	448.7045	673.5669	563.0843	418.7794	743.5673
Sony Brand	74.16119	8.33654	143.3351	76.82288	1.240811	152.3383
4K Resolution	278.3695	208.1895	363.6718	278.3709	195.6038	373.7535

- Moderate WTP increase for an 85-inch screen compared to 75 inches.
- Relatively low WTP for Sony brand at around $74 (residual) and $76 (data).
- WTP for 4K resolution is the lowest among the team at approximately $278 for both methods.

Ruben's Preferences:

Non-price Attributes	Residual Bootstrap Mean	Lower CI	Upper CI	Data Bootstrap Mean	Lower CI	Upper CI
75 Inch Screen	670.0094	506.9162	855.2387	679.0026	481.6599	910.4365
85 Inch Screen	1220.262	976.952	1529.242	1228.345	923.6029	1627.691
Sony Brand	194.592	94.20066	306.1453	194.0376	81.87107	303.5008
4K Resolution	2020.105	1650.126	2502.775	2028.456	1567.031	2613.88

- Indicates the highest WTP for an 85-inch screen at approximately $1220 (residual) and $1228 (data).
- Sony brand has a higher mean WTP at $194 for both methods.
- 4K resolution has the highest WTP of all attributes and team members at over $2000 for both methods.

Sushma's Preferences:

Non-price Attributes	Residual Bootstrap Mean	Lower CI	Upper CI	Data Bootstrap Mean	Lower CI	Upper CI
75 Inch Screen	721.6737	315.2701	1510.021	763.0089	253.2283	2031.583
85 Inch	990.9706	517.6232	1895.611	1085.078	454.5543	2726.176

Screen						
Sony Brand	254.7864	-24.18242	606.4296	284.1124	-95.87594	917.248
4K Resolution	610.9268	271.2176	1343.744	656.3149	197.6187	1689.959

- Exhibits a broad CI range, indicating more uncertainty or variability in WTP.
- Higher mean WTP for larger screens and 4K resolution.
- Sony brand has a mean WTP of $254 (residual) and $284 (data), reflecting a relatively higher valuation of the brand compared to some peers.
- Shows a high WTP for 4K resolution, similar to Ruben, with mean WTP around $610 (residual) and $656 (data).

Overall Observations:

- Preference for Size: All members demonstrate a clear preference for larger screen sizes with consistently higher WTP for 85-inch screens over 75-inch screens.
- Brand Valuation: There is variability in how much extra participants are willing to pay for the Sony brand. While some show moderate value, for others, the brand significantly affects their WTP.
- 4K Resolution: This feature has a consistently high WTP across all participants, indicating a general consensus on the value of higher resolution.
- Variability in Valuation: The confidence intervals vary among participants, suggesting that the valuation of attributes is quite personal and subject to individual preference.

Conclusion

The bootstrapped regression analysis on the TV product preferences of Team R reveals distinct individual valuations for non-price attributes. All members displayed a stronger willingness to pay for larger screen sizes and 4K resolution, pointing to these features as likely drivers of product value. Notably, the Sony brand elicited varying degrees of additional WTP, indicating differing levels of brand loyalty. The confidence intervals suggest that while the preference for certain attributes is quite personal, there's a consensus on the high value of advanced technology

features in TVs. These insights, although based on a limited sample, could guide exploratory strategies for market segmentation and product differentiation.