## *Mini-Case – The Vibes Company, Inc., Part Two*

*The questions in this mini-case should be answered by each Integrated-Project Group (IPG) working independently. Please turn in one set of answers – preferably typed or, if necessary, very neatly handwritten – from each IPG, with the names of all members clearly indicated at the top of the first page. It is the responsibility of each IPG to make sure that all members participate equally in completing this exercise. Please do not discuss this or other mini-cases or compare answers with the members of other IPGs. All IPG answers must be turned in at the beginning of class on the day when the assignment is due.*

*Unlike other mini-cases used in B6601, answers to questions pertaining to the Vibes Company may be obtained by using a spreadsheet with data manipulations provided by a financial/statistical software package such as Excel. For example, the present exercise encourages the use of Excel's regression-analysis option. Specifically, it may be helpful to enter the relevant data as a row for each make-and-model with columns of data representing the various features given in the mini-case and with the first row containing labels for those features. For example, suppose that you had data for25 makes-and-models on five features (A through E) and one dependent variable (F). You should enter labels for the features and dependent variable in the first row of data in each of the relevant columns. You should then identify these labels by clicking on "Insert"; then clicking on "Name"; then clicking on "Label"; then, under "Add Label Range," typing "A:F." Then click on "Tools"→ "Data Analysis"→"Regression." Click "Labels" and "New Worksheet Ply." Enter the "Input Y Range"as "F1:F26"; enter the "Input X Range" as "B1:E26." Click "OK" and pray. This approach should give you the needed flexibility in running the relevant regression analyses. However, please hand in <u>only</u> your answers and <u>not</u> all the intervening steps involving individual regression analyses. Good luck and have fun.*

This mini-case – The Vibes Company, Inc., Part Two picks up where Part One left off. Specifically, as a further input into his decisions concerning the possible introduction of a new make and model – the Deagan Millennium Vibraharp – the company CEO, Mr. Milt Burton, wishes to undertake additional analyses of the competitive market environment. In particular, he has asked his Director of Marketing Research – Mr. Victor "Red" Hutcherson – to undertake an analysis of brand equity in the current marketplace for vibraphones.

Mr. Hutcherson realizes that the formal quantitative analysis of brand equity is a challenge fraught with all sorts of conceptual, empirical, and emotional difficulties. However, he believes that the data set he has already collected on make-and-model features and market prices (described at some length in Part One of this mini-case) might

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enable him to estimate brand equities in the form of price premiums – or the lack thereof – for the currently available brands.

Toward that end, Mr. Hutcherson has conducted exhaustive and exhausting regression analyses to determine a set of features that combine to account for market prices with an explained variance of 76.5 percent ($R = .875$, $R^2 = .765$) and with statistically significant contributions for all features included in the model (at $p < .10$ or beyond). Recalling the descriptions provided in Part One of this mini-case, these five features may be described as follows:

Number x Average Width (numxwidth) = the number of bars multiplied by their average width = the length of all the bars laid out side-to-side (in inches)

Gold/Silver (goldsilver) = scored 9/1 for bars that are gold/silver in color (a purely cosmetic feature that does not affect the sound of the instrument)

Weight (weight) = weight of the instrument (in pounds)

Height Adjustment (hghtadj) = 9 if the height of the instrument can be adjusted for playing comfort; 1 if the height is fixed

Variable Speed (varspeed) = 9 if the instrument features a variable-speed motor; 5 if it features a single-speed motor; 1 if it has no motor

Market Price (mktprice) = an average of prices at which the relevant make and model is offered for sale on the Web or via direct distribution from the manufacturer (in dollars)

The detailed data pertaining to these five features and market prices for each make-and-model included in the sample of market offerings appear in the following table.

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Table

Data on Key Features and Market Prices for 58 Makes and Models of Vibraphones

| Make&Model | Number x Width = Length in Inches | Gold / Silver | Weight in Pounds | Height Var. Adj. | Speed | Market Price in Dollars |
|---|---|---|---|---|---|---|
| Adams AV1 | 69.26400 | 1 | 132.0 | 9 | 9 | 3222.00 |
| Adams AV1F | 69.26400 | 1 | 132.0 | 9 | 9 | 3657.00 |
| Adams AV2F | 69.26400 | 1 | 132.0 | 9 | 1 | 3362.00 |
| Bergerault VA | 72.84375 | 1 | 144.0 | 9 | 9 | 5759.50 |
| Bergerault VGC | 72.84375 | 9 | 187.0 | 1 | 9 | 6804.50 |
| Bergerault VP4 | 105.65625 | 9 | 285.0 | 9 | 9 | 7407.00 |
| Bergerault VPS | 90.56250 | 9 | 206.0 | 9 | 9 | 6785.00 |
| Bergerault VPV | 72.84375 | 9 | 157.0 | 9 | 9 | 6695.00 |
| Bergerault VR | 57.81250 | 1 | 121.0 | 9 | 9 | 5755.00 |
| Bergerault VU II | 57.81250 | 1 | 121.0 | 9 | 9 | 4224.00 |
| Dynasty DVP30 | 79.78125 | 9 | 202.0 | 9 | 9 | 6749.00 |
| Dynasty DVP35 | 90.56250 | 9 | 247.0 | 9 | 9 | 7015.00 |
| Marcon VP300 | 67.09950 | 5 | 134.0 | 9 | 5 | 4923.60 |
| Marcon VP400 | 98.41650 | 5 | 278.0 | 9 | 5 | 7729.56 |
| Mus’l Perc Antiqued | 70.30000 | 1 | 155.0 | 1 | 1 | 1000.00 |
| Mus’l Perc Shiny | 70.30000 | 1 | 155.0 | 1 | 1 | 1000.00 |
| Musser M44 Combo | 46.25000 | 1 | 75.0 | 9 | 5 | 2100.66 |
| Musser M7044 Combo | 46.25000 | 1 | 120.0 | 1 | 5 | 2452.99 |
| Musser M8044 Combo | 46.25000 | 1 | 116.0 | 9 | 5 | 2189.00 |
| Musser M46 1-Night | 69.37500 | 1 | 130.0 | 9 | 1 | 2818.00 |
| Musser M46M 1-Night | 69.37500 | 1 | 140.0 | 9 | 5 | 3311.00 |
| Musser M7046 1-Night | 69.37500 | 1 | 165.0 | 1 | 1 | 3199.50 |
| Musser M7046M 1-N | 69.37500 | 1 | 185.0 | 1 | 5 | 3663.00 |
| Musser M8046 1-Night | 69.37500 | 1 | 165.0 | 9 | 1 | 2934.00 |
| Musser M8046M 1-N | 69.37500 | 1 | 170.0 | 9 | 5 | 3498.00 |
| Musser M48 Pro Trav | 69.37500 | 9 | 112.5 | 1 | 9 | 3971.33 |
| Musser M48S Pro Trav | 69.37500 | 1 | 112.5 | 1 | 9 | 3752.00 |
| Musser M55 Pro | 69.37500 | 1 | 137.0 | 9 | 9 | 3595.99 |
| Musser M55G Pro | 69.37500 | 9 | 137.0 | 9 | 9 | 3728.99 |
| Musser M7055 Pro | 69.37500 | 1 | 187.0 | 1 | 9 | 3825.50 |
| Musser M7055G Pro | 69.37500 | 9 | 187.0 | 1 | 9 | 4119.50 |
| Musser M8055 Pro | 69.37500 | 1 | 170.0 | 9 | 9 | 3615.00 |
| Musser M8055G Pro | 69.37500 | 9 | 170.0 | 9 | 9 | 3824.00 |
| Musser M58 Piper | 69.37500 | 1 | 230.0 | 9 | 1 | 3758.00 |
| Musser M58M Piper | 69.37500 | 1 | 240.0 | 9 | 9 | 4320.00 |
| Musser M75 Century | 69.37500 | 9 | 175.0 | 1 | 9 | 3988.50 |
| Musser M75LH | 69.37500 | 9 | 175.0 | 1 | 9 | 5163.00 |

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Table – Continued

| Make&Model | Number x Width = Length in Inches | Gold / Silver | Weight in Pounds | Height Adj. | Var. Speed | Market Price in Dollars |
|---|---|---|---|---|---|---|
| Premier OAV300 | 70.30000 | 1 | 120.0 | 9 | 9 | 3154.00 |
| Premier Pro Symph | 70.30000 | 1 | 120.0 | 9 | 9 | 3669.99 |
| Ross R705 Challenger | 55.50000 | 1 | 100.0 | 9 | 9 | 2046.66 |
| Ross R715G Pro Artist | 69.37500 | 9 | 108.00 | 9 | 9 | 3028.99 |
| Ross R715S Pro Artist | 69.37500 | 1 | 108.00 | 9 | 9 | 2742.00 |
| Ross R715SF Pro Art | 69.37500 | 1 | 108.00 | 9 | 9 | 2756.00 |
| Ross RU1715S Pro Art | 69.37500 | 1 | 139.00 | 9 | 9 | 3016.00 |
| VanderPlas LW30 | 76.31250 | 9 | 161.00 | 9 | 1 | 4590.00 |
| VanderPlas LW30V | 76.31250 | 9 | 147.00 | 9 | 9 | 5756.00 |
| VanderPlas LW32 | 80.43750 | 9 | 178.00 | 9 | 1 | 5475.00 |
| VanderPlas LW32V | 80.43750 | 9 | 164.00 | 9 | 9 | 6642.00 |
| VanderPlas LW35 | 86.62500 | 9 | 205.00 | 9 | 1 | 6275.00 |
| VanderPlas LW35V | 86.62500 | 9 | 191.00 | 9 | 9 | 7440.00 |
| VanderPlas LW40 | 101.06250 | 9 | 304.00 | 9 | 1 | 6830.00 |
| VanderPlas LW40V | 101.06250 | 9 | 291.00 | 9 | 9 | 7995.00 |
| Yamaha YV1600 | 55.50000 | 1 | 83.33 | 9 | 9 | 2380.00 |
| Yamaha YV2700 G Res | 69.37500 | 1 | 127.75 | 9 | 9 | 4020.00 |
| Yamaha YV2700 S Res | 69.37500 | 1 | 127.75 | 9 | 9 | 3520.00 |
| Yamaha YV3710 | 69.37500 | 9 | 127.75 | 9 | 9 | 5036.00 |
| Yamaha YV3910 | 78.75000 | 9 | 145.00 | 9 | 9 | 5499.99 |
| Yamaha YV520 | 46.25000 | 1 | 69.00 | 9 | 9 | 1973.00 |

Based on his regression analysis of market prices (the dependent variable) predicted by these five key features (the independent variables), Mr. Hutcherson provided Mr. Burton with some helpful insights considering the extent to which each feature contributes to the market value of an instrument.

> *<u>Question #1</u>. Using the data just provided in Excel or any other multiple-regression program of your choosing, please derive the relevant regression coefficients for the five key features of interest. Based on these regression coefficients, please indicate the market-price dollar value (to the nearest penny) of (a) a 10-inch increase in length; (b) a switch from silver to gold bars; (c) an addition of 10 pounds in weight; (d) the addition of a mechanism that permits height adjustments; (e) the addition of a motor with a variable speed control.*

Having gone this far in determining the quality-related design features that contribute significantly to market prices, Mr. Burton has asked Mr. Hutcherson to estimate the price

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premiums – if any – associated with six major competing brands of interest – namely, Adams, Bergerault, Musser, Ross, VanderPlas, and Yamaha. Toward this end, Mr. Hutcherson plans to code each brand name as a 0/1 dummy variable and then to regress market prices on the five key features plus each of the various brand-name dummies (considered separately and sequentially) to estimate any statistically significant price premiums or decrements for the various brand names when compared with all other brands in the market.

> *Question #2. Please use this approach in separate analyses for each of the six relevant brand names to determine which – considered by themselves while controlling for the five features – are associated with statistically significant price premiums or decrements and to estimate the magnitudes of those price premiums or decrements.*

Mr. Hutcherson also plans to conduct a stepwise regression to enter statistically significant brand-name dummies simultaneously into the model while controlling for the five quality-related design features. This will indicate which brand names are associated with significant price premiums when compared with the remaining brands in the market.

> *Question #3. For purposes of illustration, suppose that Mr. Hutcherson finds significant price premiums for three brands included simultaneously – namely, Bergerault, Ross, and VanderPlas. Please conduct the relevant regression analysis and report the price premiums associated with (a) Bergerault, (b) Ross, and (c) VanderPlas.*

> *Question #4. Please explain why the price premium for VanderPlas is not significant when considered by itself (Question #2) but becomes significant when considered simultaneously with those of two other brands (Question #3).*

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