

## **Macroeconomic factors affecting US retail furniture/home furnishings industry sales**

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### **ABSTRACT**

This study evaluates whether disposable personal income, consumer debt burden, and consumer sentiment influence changes in furniture/home furnishings industry sales. Results using quarterly, secondary data from the period 1992 through 2013 revealed significant, positive relationships between industry sales and disposable personal income and consumer sentiment, respectively. In addition, this study found a significant, negative relationship between industry sales and consumer debt burden. Of the three explanatory variables, disposable personal income and consumer sentiment were the principal explanatory variables. The results contribute to the body of econometrics by extending extant literature to a particular line of retail trade during two decades of unprecedented economic activity. The findings should be of interest to industry practitioners, economists, investors and other industry observers.

Keywords: Furniture and Home Furnishings Industry, Sales, Disposable Personal Income, Consumer Debt, Consumer Sentiment

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## INTRODUCTION

Economists, academics, investors, and other stakeholders frequently attempt to understand the economic drivers of retail sales because retail sales are a proxy for US economic performance. One retail sector frequently cited as a bellwether for overall economic activity is the retail furniture/home furnishings industry. Remarkably while the US economy has seemingly rebounded from the 2008 great recession (Dyran, 2014) and new home sales show strength (United States Census Bureau, 2015), the furniture/home furnishings industry languishes. As evidence, 2013 year-on-year real industry sales growth is one percent. More striking is that the 5-year compound annual nominal sales growth in the sector has deteriorated from three percent in 2007 to zero percent in 2013. The apparent disconnect between current economic conditions and industry performance caused one industry insider to ask, “So, with the high-end of the [furniture] market quiet, [and] the mid-tier products still fairly sleepy, what can we do to wake the market up (Allegrezza, 2014, para. 11)?”

It should be obvious that macroeconomic factors influence the furniture/home furnishings sector. One economic indicator commonly cited in literature is housing starts (Muth & Falk, 1996; United States Department of Commerce, 2009); yet, given the current conundrum between housing market conditions and furniture/home furnishings industry revenue, it should be evident that other macroeconomic factors must also be present. The aim of this research is to investigate what influence disposable personal income, consumer debt burden, and consumer sentiment have on changes in furniture/home furnishing industry sales. Here, disposable personal income measures a consumer’s ability to purchase from current earnings while consumer debt burden assesses a consumer’s ability to purchase based on their expectation of future earnings, assuming that rationale consumers pay off their current debt with future earnings. Consumer sentiment provides a measure of how individuals perceive their financial health. Together, these three constructs provide a picture of the current and future spending power in consideration of a consumer’s feelings about her personal economy. This research contributes to the body of economic literature through its consideration of sales determinants for a specific line of retail trade. The results should be of interest to industry practitioners, economists, investors, and other industry observers.

## FURNITURE/HOME FURNISHINGS INDUSTRY PROFILE

The North American Industry Classification System (NAICS) identifies the retail furniture/home furnishings industry as:

[A] subsector [that retails] new furniture and home furnishings from fixed point-of-sale locations. Establishments in this subsector usually operate from showrooms and have substantial areas for the presentation of their products. Many offer interior decorating services in addition to the sale of products. (United States Census Bureau, 2013)

According to the NAICS Association (2015), the industry is comprised of over 100,000 businesses. Major firms within the industry include Haverly Furniture Company, Williams-Sonoma, and Gordmans Stores. The industry is monopolistically competitive with firms selling normal goods.

Industry revenues (nominal dollars) grew from \$52 billion in 1992 to \$98 billion in 2013 (United States Census Bureau, 2015), suggesting a compound annual growth rate over the time period of three percent. On the surface, this growth seems impressive. However, in real terms, 2013 industry sales are largely equivalent to 1992 levels. Further, the housing market crash and subsequent economic recession in the 2000's led to numerous bankruptcy filings among furniture/home furnishing retailers, including Levitz, Wickes Furniture, Bombay Company, Linens 'n Things, and Fortunoff. Many of these firms did not emerge from bankruptcy, and the industry has struggled to recover to its pre-recession growth pace. Despite this evidence, some believe the industry is rebounding (Chavez, 2014).

## LITERATURE REVIEW

The investigation of factors affecting retail sales is an intermittent topic of interest in academic writing. Grounded in economics, prior literature suggests that per capita disposable income, a household's debt burden, and consumer sentiment may be contributing factors affecting retail sales. The research question under consideration in this study extends prior literature by analyzing a specific line of trade during two decades of unprecedented economic activity.

Consumer behavior theory provides the theoretical base for per capita disposable income as an explanatory variable of furniture/home furnishing industry sales. Consumer behavior theory explains how consumers allocate their income among goods and services (McConnell, Brue, & Flynn, 2009). Since furniture and home furnishings are normal goods, consumer behavior theory suggests that consumers would tend to buy more as their incomes increase and less when their incomes fall. Building on consumer behavior theory, two prominent studies by Liu (1970) and Ingene and Yu (1982) examined the role of per capita income in determining retail sales. While both studies found statistically significant relationships between higher per capita income and higher retail sales, Ingene and Yu's research thoughtfully extended sales determinants to various lines of retail trade, including furniture. However, their study is dated; more so, Ingene and Yu found that disposable income along with consumer age explained less than 10 percent of the variation in per capita furniture sales. Clearly it is time to revisit the relationship between disposable income and furniture/home furnishings sales. Hence, based on prior literature and given the relationship between income and normal goods, this research expects a direct relationship between disposable personal income and furniture/home furnishings industry sales. A positive beta should represent the positive income elasticity associated with normal goods. Therefore, it is hypothesized:

H<sub>1</sub>: There is a positive relationship between disposable personal income and retail furniture/home furnishing industry sales.

Economic theory also suggests that the availability and use of consumer credit may affect consumer expenditures on all goods, particularly durable goods. Importantly, consumers frequently borrow funds to purchase long-lasting goods, thereby exceeding their current income levels and ultimately choosing to trade future consumption opportunities for current debt payments. However, a consumer's ability to procure credit in the short-term may be moderated by their current debt burden which in turn impacts his ability to purchase long-lasting goods. A study by Murphy (1998) explored the extent to which consumer debt burden explains aggregate

consumer spending; he found that the debt burden of households is a statistically significant predictor of future consumer spending growth. He suggested that increases in a household's debt burden leads financial institutions to tighten lending standards for borrowing-constrained households, thereby restricting their ability to finance additional purchases with credit. Murphy's findings are consistent with the widely held belief that constrained consumers will limit their spending most sharply on discretionary items like durable goods and services but not for non-durable goods like food and clothing. Given this, it is easy to infer that as household debt rises, the ability of the consumer to obtain additional credit (e.g., a furniture installment loan) should decrease. Therefore, one can expect that there is an inverse relationship between debt burden and industry sales; that is, the higher the debt burden, the less likely a consumer will be able to buy furniture/home furnishings. Thus, it is hypothesized:

H<sub>2</sub>: There is a negative relationship between consumer debt and retail furniture/home furnishing industry sales.

Finally, on balance, literature suggests that consumer sentiment influences consumption. For example, studies by Carroll, Fuhrer, and Wilcox (1994) and Bryant and Macri (2005) suggest that consumer sentiment explains some variation in the growth of consumer expenditures. In a different study that focused on classification of goods, Jennings and McGrath (1994) noted that consumer sentiment is a fundamental determinant in sales of durables. Importantly, all three of these studies observed that changes in consumption lagged changes in sentiment. Taken together, there is strong evidence that consumer sentiment may play a role in understanding changes in furniture/home furnishing sales. Therefore, consistent with prior literature, there should be a direct, but lagged, relationship between consumer sentiment and industry sales. That is higher consumer sentiment should lead to higher industry sales. As such, it is hypothesized:

H<sub>3</sub>: There is a positive relationship between consumer sentiment and retail furniture/home furnishing industry sales.

## METHODOLOGY

The purpose of this study is to evaluate whether three macroeconomic factors influence changes in sales within the furniture/home furnishings industry. This is accomplished through correlation analysis and ordinary least squares (OLS) regression. The regression variate is:

$$S_q = \alpha + b_1 (INC_q) + b_2 (DEBT_q) + b_3 (CS_{q-2})$$

Where,

- S seasonally adjusted, quarterly furniture/home furnishings industry sales
- INC seasonally adjusted, quarterly disposable personal income per capita
- DEBT remaining quarterly credit capacity as a percentage of disposable personal income
- CS quarterly consumer sentiment lagged two-quarters
- $\alpha$  intercept term, and
- $b_i$  the regression coefficients

A regression analysis was deemed sufficient to identify statistically significant relationships; both the sample size and the ratio of observations to independent variables (29:1) suggest that the model is generalizable (Hair, Black, Babin, Anderson, & Tatham, 2006). The criterion for statistical significance is 95%.

Publicly available, secondary data were used to test the hypotheses; quarterly values for the period 1992 through 2013 provided 88 quarterly observations. The dependent variable is industry sales (S) and is measured by seasonally adjusted retail furniture/home furnishings industry sales from the United States Census Bureau (2015). The data was retrieved under NAICS code 442, Furniture and Home Furnishings Stores. The data was downloaded to a spreadsheet from the internet and converted from text to columns. Since the data was not adjusted for price changes, factors were applied to convert the data from current dollars to real dollars (base year of 2009 = 100%). The data is stored in billions of dollars.

The principal explanatory measures are per capita disposable personal income (INC), consumer debt burden (DEBT), and consumer sentiment (CS). To represent per capita disposable personal income, this study used seasonally adjusted, real disposable personal income per capita (chained to 2009) from the United States Bureau of Economic Analysis (BEA) (2015). The data was retrieved from the BEA's interactive National Income and Accounts Table; monthly data was extracted to a spreadsheet. The data is stored in whole dollars.

As a proxy for the consumer debt burden, this research used the household debt service ratio (DSR) from the Federal Reserve Board (2014). The household debt service ratio is "an estimate of the ratio of debt payments to disposable personal income (Federal Reserve Bank, 2009, para. 3)." Quarterly data was downloaded from the internet to a spreadsheet; the data was modified by subtracting the DSR ratio from 20%. Kapoor, Dlabay, and Hughes (2009) suggested that 20% was a fair standard for a maximum debt ceiling for a consumer. As a result of the modification, DEBT represents the remaining credit capacity as a percentage of disposable personal income that consumers can access before exceeding recommended debt limits. The underlying assumption is that rational consumers will not exceed the general rules of credit capacity to purchase furniture or home furnishings. The data is stored in percentages.

Consumer sentiment is represented by the Index of Consumer Sentiment from the Survey Research Center at the University of Michigan (2015). Since the index expresses how consumers view prospects for their financial situation, a quarterly index above/below 100 suggests positive/negative sentiment. The quarterly data was electronically copied from the source tables to a spreadsheet. For this variable alone, the data retrieved covered the period 1991 (3rd Quarter) to 2013 (2nd Quarter). The two-quarter difference between this variable and the dependent variable represents the recognized lag between consumer sentiment and retail sales. Lagging consumer sentiment is consistent with prior research (see e.g., Bryant & Macri, 2005). Since the data is an index, the data is stored in whole numbers.

Regression assumptions for the individual variables including linearity, constant variance, and normality were examined. Scatter plots of the explanatory variables did not indicate nonlinearity. However, the homoscedastic assumption was violated (Levene's Test,  $p < .05$ ). In addition, probability plots revealed substantial deviation from normality in the dependent variable and in two of the three independent variables. Transformations provided insufficient remedy.

## FINDINGS OF THE STUDY

Descriptive statistics for the dependent and independent variables are shown in Table 1 (Appendix). Mean quarterly industry sales were \$24.3 billion (2009 dollars), with a peak quarterly sale of \$30.3 billion in Q1 2006 (2009 dollars). While per capita disposable personal income increased throughout the study period, the average quarterly index of consumer sentiment for the subject period was below 100, with the median sentiment at 88.70. One can infer that consumer sentiment was adversely affected by the internet bubble burst of the late 1990s, the 9/11 terrorist bombings, and the economic meltdown in the financial and home markets of the late 2000's. Finally, mean consumers' credit capacity as a percentage of disposable personal income was 8.4%.

Summarized results of the correlation analysis and ordinary least squares regression are listed in Table 2 and Table 3 (Appendix), respectively. The results of the regression indicated that the independent variables jointly explained 87% of the variance in the dependent variable ( $R^2 = .871$ ,  $F(3, 84) = 188.99$ ,  $p = .000$ ). A review of the standardized coefficients suggests that consumer sentiment and per capita disposable personal income were the most important explanatory variables, followed by consumer debt burden. Based on these results, the following linear function is put forth:

$$S_q = 9.48 + 0.000522 (INC_q) + (-1.826) (DEBT_q) + 0.1544 (CS_{q-2})$$

Customary regression diagnostics including collinearity, autocorrelation, and residual analysis were completed. The tolerance/variance inflation factor (VIF) statistic suggests no collinearity. Positive autocorrelation may be present ( $DW = .444$ ) but as noted by Lind, Marchal, and Wathen (2005), autocorrelation typically occurs with time-series data. A normal probability plot of the standardized residuals revealed that the error term follows a normal distribution ( $AD = 0.570$ ,  $p = 0.135$ ). Further, reviews of the residual plots did not expose a uniform pattern. Therefore, normality issues should not be a concern.

In line with theory, the results presented in Table 3 (Appendix) confirm  $H_1$ . The regression coefficient indicated a positive relationship between per capita disposable personal income and industry sales; the relationship also validated a normal good hypothesis as the positive regression coefficient suggests that more furniture and home furnishings will be purchased as income rises and less as income falls. Industry sales and per capita disposable personal income were significantly correlated ( $r_s = 0.387$ ,  $p = .000$ ).

The results support  $H_2$  which confirms the inverse relationship between consumer debt burden and industry sales. As consumers take on more debt, thereby reducing their ability to borrow additional funds before exceeding recommended debt limits, their propensity to purchase furniture and home furnishings decreases. Industry sales and consumer debt burden were significantly and negatively correlated ( $r_s = -0.742$ ,  $p = .000$ ).

Finally, the results show that lagged consumer sentiment is positively associated with industry sales as evidenced by the positive regression coefficient; therefore,  $H_3$  is supported. Increases in consumer sentiment suggest that industry sales will increase; the inverse of this relationship would also hold true. Industry sales and consumer sentiment were significantly correlated ( $r_s = 0.413$ ,  $p = .000$ ).

## **DISCUSSION**

The importance of a particular retail sector like furniture/home furnishings in the nation's economy is widely recognized. Seeking to provide insights into possible macroeconomic determinants of this industry's sales beyond the widely accepted determinant of new housing starts, this research explored the influence of three additional explanatory variables: disposable personal income, consumer debt burden, and consumer sentiment. The results provided quantitative support that all three constructs influence changes in total industry sales.

Collectively, the results suggest that consumers consider both their current financial condition and their future financial condition in the context of their personal economy when deciding whether to purchase big-ticket items like furniture and home furnishings. The reaction of industry sales to changes in per capita disposable personal income was not unexpected given the line of trade and the nature of the goods under review. Clearly stated, the more disposable income consumers have, the better off the industry. However, the surprising importance of consumer debt burden suggests that furniture/home furnishing retailers should be sensitive to both a consumer's ability and desire to take on additional debt, especially if a consumer is nearing her debt ceiling. Finally, the results affirm that changes in consumer sentiment may be a leading indicator for the industry.

Combined, the results have practical implications for both industry practitioners and industry observers. First, for industry practitioners, the results provide new insight for revenue forecast builds; practitioners should consider macroeconomic indicators like consumer debt burden and changes in disposable incomes in their forecasting process and not rely solely on traditional revenue forecasting procedures like sales trends and seasonality. The importance of consumer debt burden means that industry retailers may have to continue developing creative ways to entice consumers into showrooms including no-interest loans or variable pricing depending on the payment terms. More so, the industry must be flexible, adapting to ever-changing environmental factors to ensure continued sales growth. For example, retail establishments should price and advertise strategically when consumer sentiment begins to escalate. Likewise, the results should be equally significant to industry observers (i.e., creditors and investors) as an understanding of the role of these macroeconomic influences on the sector may aid in credit issuance or share purchase/sale decisions.

## **STUDY LIMITATIONS AND FUTURE RESEARCH**

Limitations of this study include significant violations of normality and constant variance; while a review of the residuals minimized these concerns, the insights presented in this study may be biased. More so, the use of aggregated macroeconomic data may limit the ability to generalize industry-level outcomes to identifiable firms within the industry. Furthermore, findings are based on a period of unprecedented economic uncertainty; additional longitudinal studies may find different results. While this study advances econometric literature, more research possibilities exist including furniture/home furnishings firm-level field research or other significant macroeconomic variables relevant to the sector.

## SUMMARY

In sum, this study supports extant literature by providing quantitative support for three macroeconomic determinants of retail furniture/home furniture industry sales. The results suggest that disposable personal income, consumer debt burden, and consumer sentiment are relevant when explaining and predicting changes in furniture/home furnishing industry sales. In addition, the results indicate that consumer sentiment and disposable personal income were the most important explanatory variables, followed by consumer debt burden. Importantly, the findings show that consumers rely on current incomes, their expectation of future earnings, and their overall perception of their personal economy when purchasing furniture and home furnishings.

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## APPENDIX

**Table 1: Descriptive Statistics**

| Variable       | N* | M      | SD    | Min    | Median | Max    | Skewness | Kurtosis |
|----------------|----|--------|-------|--------|--------|--------|----------|----------|
| S (\$Billions) | 88 | 24.3   | 3.6   | 18.1   | 23.2   | 30.3   | 0.07     | -1.29    |
| INC (\$)       | 88 | 32,253 | 3,776 | 25,987 | 32,809 | 37,832 | -0.37    | -1.36    |
| DEBT (%)       | 88 | 8.4    | 0.9   | 6.8    | 8.6    | 10.2   | 0.10     | -1.19    |
| CS             | 88 | 86.7   | 13.1  | 57.7   | 88.7   | 110.1  | -0.24    | -0.57    |

\* Quarters

**Table 2: Correlation Matrix (Spearman  $r_s$ )**

|      | S                           | INC                         | DEBT                    |
|------|-----------------------------|-----------------------------|-------------------------|
| INC  | 0.387<br>$p = 0.000^{***}$  |                             |                         |
| DEBT | -0.742<br>$p = 0.000^{***}$ | -0.221<br>$p = 0.038^*$     |                         |
| CS   | 0.413<br>$p = 0.000^{***}$  | -0.458<br>$p = 0.000^{***}$ | -0.222<br>$p = 0.037^*$ |

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

**Table 3: Regression Results**

| Variable | b        | $\beta^{\#}$ | SE b     | t-stat | p-value  | VIF  |
|----------|----------|--------------|----------|--------|----------|------|
| Constant | 9.48     |              | 3.28     | 2.89   | 0.005**  |      |
| INC      | 0.000522 | 0.5522       | 0.000046 | 11.37  | 0.000*** | 1.53 |
| DEBT     | -1.826   | -0.4687      | 0.177    | -10.34 | 0.000*** | 1.34 |
| CS       | 0.1544   | 0.5649       | 0.0128   | 12.05  | 0.000*** | 1.43 |

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

# The standardized coefficient is calculated by multiplying the unstandardized coefficient by the ratio of the standard deviations for the independent and dependent variables, respectively.