



January 2015

Changes In Consumer Behavior Since 1992: A Case Study Of American Shopping Malls

Caitlin Adeline Elliott

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CHANGES IN CONSUMER BEHAVIOR SINCE 1992: A CASE STUDY OF
AMERICAN SHOPPING MALLS

by

Caitlin Adeline Elliott
Bachelor of Business Administration, University of North Dakota, 2015
Master of Science, University of North Dakota, 2015

A Thesis
Submitted to the Graduate Faculty

of the

University of North Dakota

in partial fulfillment of the requirements

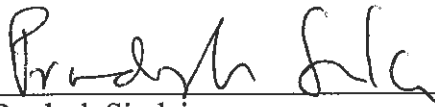
for the degree of

Master of Science in Applied Economics

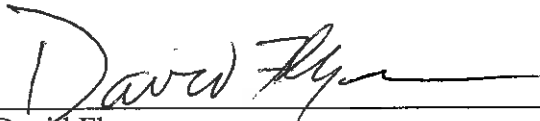
Grand Forks, North Dakota
December
2015

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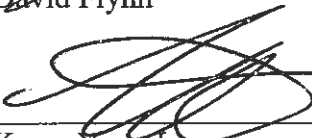
This thesis submitted by Caitlin Elliott in partial fulfillment of the requirements for the Degree of Master of Science from the University of North Dakota, has been read by the Faculty Advisory Committee under whom the work has been done and is hereby approved.



Prodosh Simlai

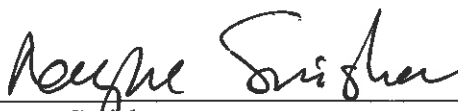


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This thesis is being submitted by the appointed advisory committee as having met all of the requirements of the School of Graduate Studies at the University of North Dakota and is hereby approved.



Wayne Swisher
Dean of the School of Graduate Studies



Date

PERMISSION

Title Changes in Consumer Behavior since 1992: A Case Study of American Shopping Malls

Department Economics and Finance

Degree Master of Science in Applied Economics

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Caitlin A Elliott

November 17, 2015

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ACKNOWLEDGMENTS

I would like to thank my advisors for their consistent feedback and support this semester. I would especially like to thank Dr. Prodosh Simlai for his guidance in all things data, and Dr. David Flynn for his advice on organization and writing style. I would like to thank my parents for their constant support and love. Finally I would like to thank Tami Swiers for always being there for moral support. The Economics department at UND has been a second home to me and I could not think of a better place to complete my graduate degree.

ABSTRACT

Consumer behavior is highly correlated with economic conditions. The American shopping mall, an innovation of the 1950's was built as a retail hub for consumption and entertainment purposes. Utilizing a data set ranging from 1992 – 2014, this paper researches the rapid decline and disappearance of shopping malls. To account for the number of shopping malls that have failed, I use the seasonally adjusted quarterly sales of department stores. Regressions are completed using ordinary least square (OLS) methodology. Three economic and societal changes are studied in regards to the cause behind the decline. The rising income inequality gap, the short term effects of the Great Recession, and the growth of Ecommerce and internet (mobile) connectivity. Of these threats, the most significant cause behind the decline is the growth of Ecommerce and the associated innovation of the internet and mobile phone usage. The rising income inequality gap, and the decreasing size of the middle class also offers explanation into the decline. The Gini coefficient is significantly inversely related to the sales of department stores. The least effective theory behind the decline is the Great Recession. The effects of the recession were experienced in every aspect of the economy, and department store sales declined as a results of declining purchasing power and disposable income.

CHAPTER I

INTRODUCTION

Of the major industries, retail is one of the more difficult markets to maintain profitability. This is due to high fixed costs, large inventory, and constantly changing preferences. Shopping centers are large complexes with the sole purpose of providing retail space. With a history of success beginning in the 1950's, shopping centers are a part of childhood memories across the country. These once powerful retail spaces that offered shopping, food, and a social environment, are now on the brink of becoming extinct. The objective of this paper is to determine what major change of the last 20 years has caused the disappearance of shopping centers.

Shopping centers were in their prime in the 70's, but ever since they have slowly begun to disappear. Many threats to shopping centers have occurred over the last few decades, from recessionary times to the growth of online shopping. It is not possible to look at one specific cause and determine it is to blame for the decline. Instead, this paper focuses on three topics and their individual and joint contributions. Of the potential causes toward decline, the three of interest are increasing income inequality, the great recession, and the growth of the internet and online shopping.

Individually, all three areas have explanatory power into the decline of sales. The most significant is the growth of the internet. The innovation of the internet has caused many changes within society, and shopping malls are hurting as a result. Online shopping has

greatly increased the ease and speed of consumption, and social media has changed the way Americans spend leisure time. The dot com revolution brought large scale retailers into the industry, and shopping centers market share has quickly diminished. Retailers like Amazon have become a few of the most powerful companies in the industry, and do not operate traditional brick and mortar stores.

The recession affected the economy as a whole, especially shopping centers. Decreased purchasing power and disposable income was felt by the majority of Americans, and spending time at the mall became no longer affordable. The variables utilized to capture the effects of the recession are proven to be the least relevant within the data. The growth of income inequality has begun to diminish the middle class, and changing demographic makeup of the suburbs has caused the market strategies of malls to become obsolete. This change has a significant impact on sales within the dataset.

A data set has been created utilizing measures found through various government related sources. This paper studies variables on a quarterly basis, in 2014 dollars, and seasonal adjustments are made where appropriate.

CHAPTER II

LITERATURE REVIEW

Historical Development of Shopping Centers

Suburban Culture

During the 1950's the United States was thriving and the middle class was growing. Owning an automobile was attainable, and suburbs were being built across the country. People no longer had to be confined to urban life due to the automobile and the ease of travel. Suburban culture was perceived to be safer than city environments, and was the perfect place for young couples to begin raising their families. These changes ushered in another innovation, the American shopping mall – a centralized retail hub that was the most convenient way for consumers to shop, eat, and socialize in one central location.

Growth of a New Industry

In 1986, The New York Times ran a story, *Why Everyone goes to the Mall*, in which they stated that “by 1960 there were 4500 malls accounting for 14% of retail sales. By 1975 there were 16,400 shopping centers accounting for 33% of retail sales. In 1987, there were 30,000 malls accounting for over 50% of all retail dollars spent (about 676 billion dollars, 8% of the labor force, and 13% of our gross national product)” (Keinfeldis, N). The same year, Consumer Reports stated “The "air-conditioned, sanitized, standardized" shopping malls "have become the new Main Streets of America" (Consumer Reports,

1986). The pillars of these great malls were department stores, another shopping innovation that were becoming increasingly popular due to Sears's shopping catalogs and Christmas time sales. Post WWII, the United States consumers had money to spend and retail sales were at a high.

Shopping centers were not only popular for consumers, but for retailers too. Through renting space, they exposed their business to increased foot traffic and sale opportunities. Retailers experienced reduced operating costs, as the shopping centers were maintained, heated, and secured at the expense of the developer. Due to the popularity of shopping centers, retailers' revenues exceeded their rental costs by large margins, and expected profitability was high.

Rapid Decline

The last large-scale shopping center developed in the United States occurred in 2006. It has been 10 years since this development, and shopping centers are shutting down at exponential rates. There are only 1000 shopping malls left across the nation. A 300% decrease in just 30 years. It is predicted that within the next decade, 50% of the malls remaining will also close their doors (Solman 2014). What is behind this trend? Why are these shopping malls that once accounted for over 50% of retail sales now abandoned and left to rot? Many newspaper articles discuss the decline of shopping malls – but no academic research has been conducted on this specific topic. My contribution to this literature is finding data driven conclusions as to why it is occurring. The media reports many different reasons as to why shopping malls are failing: the most popular reasoning being the growth of online shopping.

Current Threats to Shopping Centers or Potential Causes behind the Decline

Connectivity and the Growth of E-Commerce

The ITU database (2015) conducted research on how our world is connected and found that in the developed world, 77 of every 100 people are connected to the internet. Further, the World Bank (2015) found that as of 2014, there are 98 mobile service subscriptions for every 100 people. Compared to 4.2 in 1992, our world has drastically changed with the rise of the internet and mobile connectivity. AMP Capital (2013) conducted research and found that since 2005, over 19% of the retail industry growth is directly attributable to online shopping. Figure 1 displays retail trade values since 2000 in Billions of dollars, and the growing portion that is due to e-commerce.

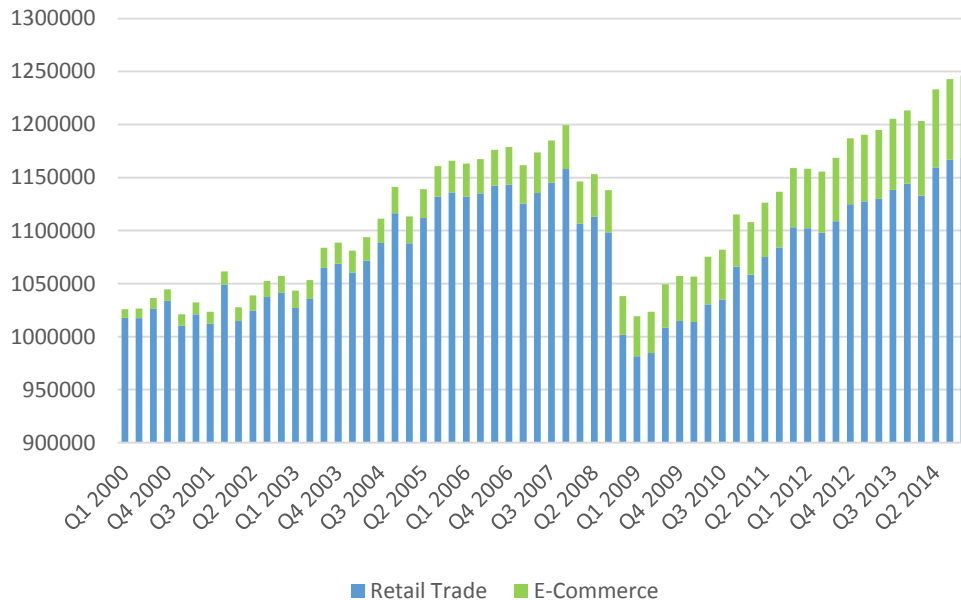


Figure 1: Retail Trade and E-Commerce 2000 - 2014

Figure 2 further illustrates the rapid growth rate of e-commerce, comparing it to the growth rate of the overall retail industry. There is a significant gap between the growth rate of e-commerce and that of overall retail trade.

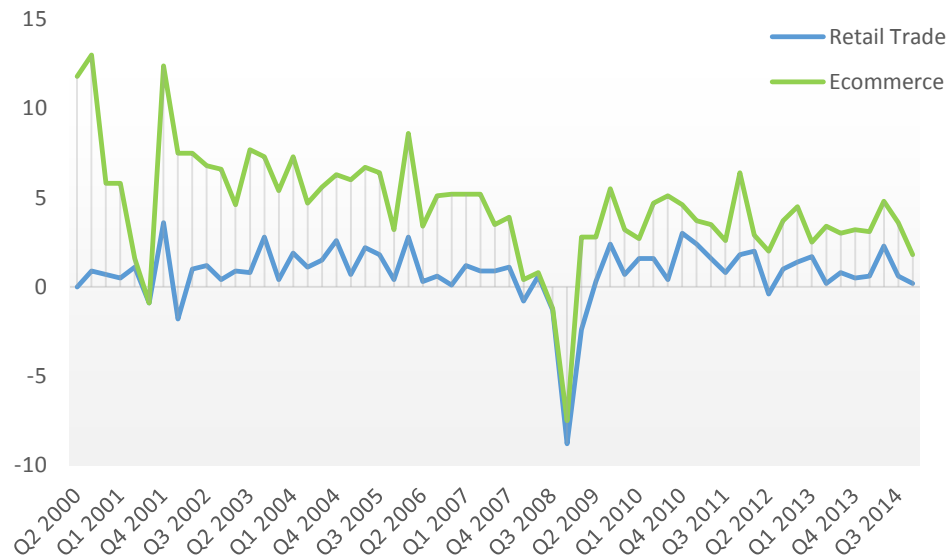


Figure 2: % Change from Previous Quarter 2000 - 2014

In the United Kingdom, over 39% of their retail growth is attributable to online shopping in 2013 (AMC 2013). These numbers suggest that online shopping has become the new norm for younger generations. If the United States follows in the footsteps of the UK, retail growth of the future is dependent on online sales. A study on the impact of social media on the consumer, conducted by researchers in Romania found that of their sample group, 67% of the male respondents preferred shopping online versus in a physical store. Their research discusses why consumers prefer to shop online, and they found that convenience was the number one reason. Other reasons behind the preference was direct delivery, less time spent shopping, and ability to easily compare prices (Ioanas, Stoica (2014)).

The growth of e-commerce directly caused large shifts in market behavior. Specifically, market shares have been relocating from high-cost producers to their low-cost counterparts. The causation behind this trend has been mainly attributable to a sharp decline in search costs associated with consumption (Goldmanis, Hortacsu, Syverson, and Emre (2009)). Search costs can be defined as the “time, energy and money expended by a consumer who is researching a product or service for purchase” (Investopedia 2015)¹. The rise of the internet offered consumers the ability to compare hundreds of prices all while in the comfort of their own home. This convenience was perfect for the modern day consumer where time was, and still is, limited and valuable. Another modern innovation that had interesting effects on consumption behavior was the invention of the smart phone. The internet became largely accessible, and over 98% of Americans owned a mobile device in 2014 (Pew Research Center). A study by Rulz and Sanz (2005) looked at the most common characteristics of the mobile shopper in Spain. They found that 61.9% were between the ages of 14-24, over 47% were of the middle class, and 64% lived in Spain’s version of the United States suburbs. The popularity of mobile shopping in the younger demographic has inherently negative effects on shopping center sales. The rise of mobile connectivity was highly negatively correlated with shopping center sales. Market researcher by Burt and Sparks (2003) found that “existing retail floor space would need enhancement in quality and presentation if it was to continue to provide retail functions.” In order for malls to stay relevant and profitable, they had to develop a competitive edge to draw in customers and retain retailers.

¹ The definition of search costs was obtained through Investopedia.com

The Great Recession

The Great Recession of 2008 caused many problems for shopping centers that were already having trouble staying alive. The recession caused decreased purchasing power for most Americans, and many had to cut shopping out of their budget. The type of goods offered at your typical shopping mall are classified as normal goods with a high elasticity. During the recession normal goods were exchanged with substitute goods that came at a lower price. This caused decreased demand for the non-durable goods sold in the shopping center. Decreased revenues caused the marginal revenues of retailers to diminish. In addition, there are large risks associated with renting space within a shopping center. Zentner and Campbell (2014) found that “rental expenses can account for anywhere up to 45% of a retailers operating costs base.” Without sustainable profitability, shopping center tenants can-not afford rental space and have to vacate. This relationship occurred on a large scale; many malls were not able to keep tenants, but still incurred the same fixed operating costs, and many developers had to close their doors.

A case study done in the Kingdom of Bahrain discusses how the global business crisis affected consumption behavior. They discussed how the recession that hit America caused a ripple effect that changed consumer behavior across the globe. They found that within their sample group, the recession caused decreased consumption due to “lowered disposable income, increased opportunity cost risk, decreased savings, and overall job uncertainty” (Mansoor, Jalal (2010)). The reasons behind decreased consumption in

Bahrain holds true for American consumers. The recession caused decreased disposable income, and shopping was no longer a priority for many Americans. Unless a shopping mall was built for high end clients, in a wealthy neighborhood, the recession could very well have been the cause all to end all for many malls.

Even prior to the recession, consumers had been decreasing their consumption of normal, non-durable goods. Significant research has been done on the use of “spontaneous consumption contractions” as a predictor of economic downturn. Research has suggested that consumption patterns have been influenced by more than just disposable income. Instead, factors such as unemployment, market outlook, and government spending were also explanatory toward changes in consumption (Hall 1993). Further, Stephens (2001) found that increased probability of future job loss caused households to reduce their consumption well before knowledge of actual job loss occurred. Carroll, Dynan, and Krane (2003) find that those taking precautionary steps are typically in the middle to higher income households. Using lagged values of expenditure variables we can test to see if this precautionary behavior has a strong relationship with declining shopping center sales.

In addition to the precautionary behavior displayed by many Americans, the recession of 2008 caused overall negative feelings toward future economic stability that have cast long term effects on consumption behavior. Many Americans acted in response to the rapid decline of the market by decreasing their expected future spending habits. Hurd and Rohwedder (2010) found that between 2008 – 2009, nearly 39% of American households had faced unemployment, had negative equity on their house, or were behind in house payments. They further discovered that 79% of Americans had decreased their spending,

with only 8% of those surveyed expecting an increase in spending habits in the future. This overall negative outlook on future disposable income gives insight as to the lack of new shopping center construction since 2006.

Growth of Income Inequality

Data from the Census Bureau (2015) states that the Gini Coefficient (a popular way to measure income inequality) has risen over 20% since 1968. In addition, the difference between the mean income and the median income in America has consistently grown over the last 20 years. With the exception of 3 years, the growth rate has been at minimum 2%. Research has found that “the top 1% of our population has as much wealth as the other 99% combined... the richest 1% have seen their share of global wealth increase from 44% in 2009 to 48% in 2014” (Slater 2015). Foster and Wolfson completed a study in 1992, where our data set begins, and found evidence that polarization of the income distribution was indeed on the rise in the United States. This rise of inequality has been shown to effects many aspects of an individual’s spending habits, causing decreased consumption for those negatively affected. Cutler and Katz (1991) discussed this relationship using evidence from the 1980’s, and found a highly correlated relationship between changes in the distribution of consumption and changes in the distribution of income. This relationship is interesting for researching the demise of shopping centers because of the demographic makeup of those most affected by income inequality. By nature, the lowest fifth of the income distribution are effected the most by declining income and mobility, but it is interesting to look at what happens to the middle class. Figure 3 shows the growth rate of income inequality between 1992 and 2014. The top line is the highest 5% of the population, and the second line is the top fifth of the

population. The gap between the top fifth and the bottom fifth (the lowest line) has been steadily increasing.

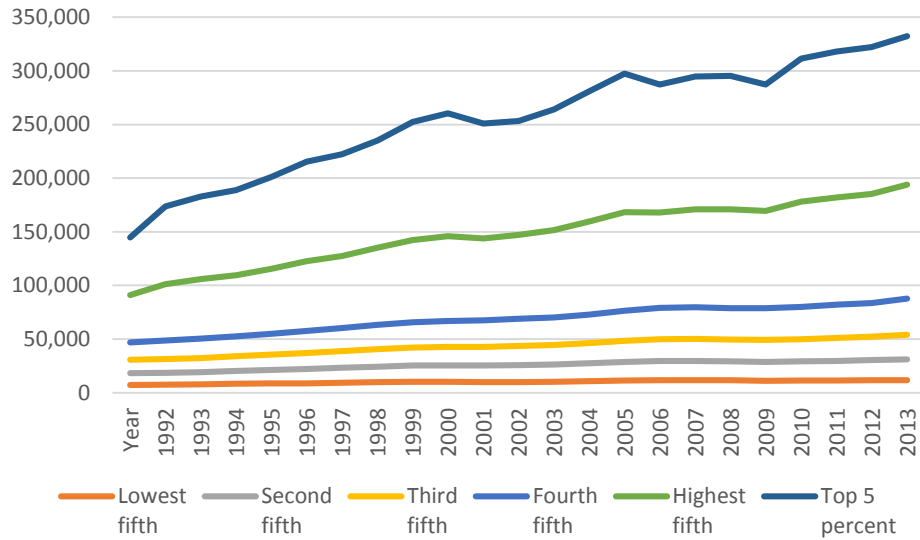


Figure 3: Mean Income 1992 – 2014²

Income inequality has been growing at a rapid rate with no signs of slowing down. With the growth of the inequality gap, the middle class has diminished. A report published by Deloitte suggests that the middle class has split into upper middle class and lower middle class. The upper middle class tends to shop at higher end, name brand stores, and the lower middle class tends to shop at discount stores (Kalish 2011). With this splitting of a market, the department stores that were built for the middle class have experienced declined sales. Figure 4 displays the overall decline of sales experienced by the department store industry. Sales have fallen over 42% between 1992 and 2014.

² Data collected from the Census Bureau (2015)

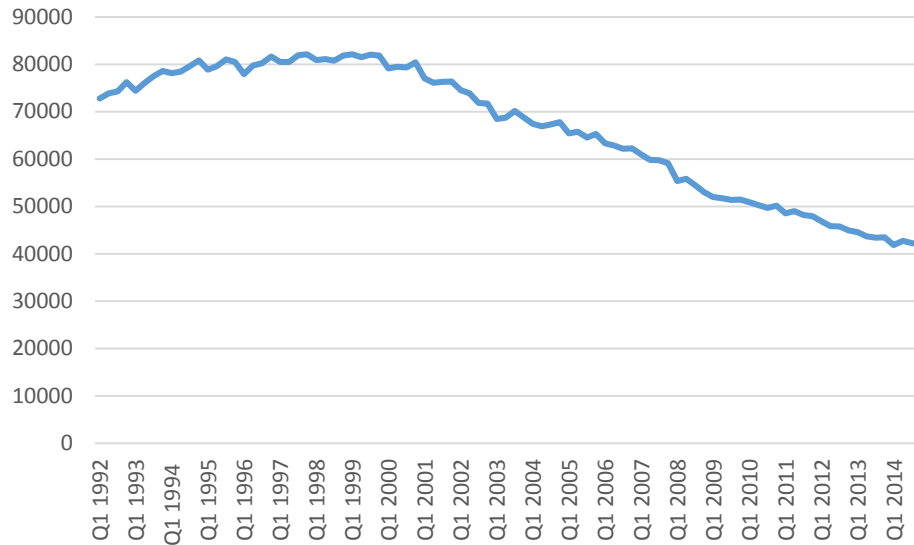


Figure 4: Seasonally Adjusted Department Store Sales 1992 - 2014³

Large stores such as JC Penny’s and Sears had been announcing store closings and layoffs left and right. The once strong pillars of shopping malls were failing, and no longer able to support the rest of the mall. Those most affected by the increasing size of the inequality gap are the same target demographic of shopping malls.

Change in Preferences

A popular topic of social scientists across the board, is the behavior of millennials (generations y and x), and how their preferences are shaping our culture. The once appealing suburbs of the prior generations are no longer preferable to today’s young adults. Cities were once thought of as a place of poverty, crime, and violence, and young couples were not interested in raising a family in those environments. Today, cities have changed to be a place of wealth, where young, educated professionals prefer to live.

Researchers at the University of Virginia did a report called “The Changing Shape of

³ Data on the adjusted department store sales was collected from the Census Bureau (2015).

American Cities,” in which they discussed these trends. Evidence was found to support the notion that “resurgence of historic downtown and urban neighborhoods (has caused) rising demand, and the potential to drive up prices and bring new opportunities the neighborhoods abandoned by middle-class residents in the 1950’s and 60’s” (Juday 2015). With the influx of millennials to once abandoned neighborhoods, and increased prices of housing, lower income residents could no longer afford to live in the cities and have been “switching places” with the middle class, moving to the original suburbs.

These original suburbs were where the shopping centers were built. The new demographic makeup of the suburbs now demanded different types of retail markets than what the typical mall has offered. Many malls suffered due to increased gang behavior and decreased neighborhood income. These changes caused malls to change their marketing dynamic, offering discount and outlets stores that were unable to keep the malls alive (Solman 2014).

This trend also affected the increasingly wealthy cities that had been booming with young, educated millennials. Those who moved into the newly renovated downtown areas, tended to prefer shopping in downtown shops and boutiques rather than a shopping center. A completed in Russia discussed the role of retail gravitation, a concept proposed in 1931, and its effect on whether consumers shop downtown or in the suburbs. Simply put, while suburbia culture was popular, the malls were booming because of proximity and lack of competition (Ushchev, Sloev (2015)). Now that living downtown was the trend, malls were losing their steam because they were no longer competitive, nor in close proximity. Utilizing the information provided, this research attempts to find which area of threat causes the most harm to shopping center sales.

CHAPTER III

DATA SELECTION AND METHODOLOGY

The majority of the data used for this research has been obtained from the Census Bureau, The Bureau of Labor Statistics, and The Federal Reserve: St. Louis (2015). The data is in quarterly observations beginning in the first quarter of 1992 and ending in the fourth quarter of 2014. The data has been price adjusted to be in 2014 dollars, and is seasonally adjusted when appropriate.

Dependent Variable

For the dependent variable, there is not readily available data on the number of shopping centers that close each year. In looking for a variable that accounts for the successes and failures of shopping centers, it is natural to look at the stores that are the pillars of said malls. Department stores have been anchoring shopping centers since day one, and there is readily available data on the monthly sales of department stores as an industry. I converted the data into quarterly frequency, adjusted it to 2014 dollars, and utilized the seasonally adjusted version made available by the Census Bureau. We need to exercise some caution using this as a “replacement” for shopping center closure data. To defend this choice, we can look at the theory of shopping centers, the overall decline of department store sales that is highly correlated with the closure of shopping centers, and common knowledge of several occasions when a department store goes out of business and an entire mall has failed as a repercussion.

Equation (1) demonstrates the basic regression formula utilized in this paper. I estimate each regression with OLS methodology. Where the $\text{Log}(S)$ is the logged value of department store sales, X 's are independent regressors, and ε_i is the error term.

$$\text{Log}(S) = \alpha + \beta_1 X_1 + \dots + \beta_k X_k + \varepsilon_i \quad (1)$$

Independent Variables

To test a variety of hypotheses to explain what threat has the largest effect, many independent variables are used. In addition to government sources, data was collected from the Pew Research Center, Yahoo Finance, and the World Bank. Given the nature of the data, multicollinearity was an issue and has been corrected for by creation of proxy variables.

Recessionary Variables

To test for a recessionary cause the dummy variable `up_gdp` is used in each regression as seen in equation (2). This variable takes a value of 1 when the change in GDP from the previous quarter is positive.

$$\text{Log}(S) = \alpha + \beta_1 X_1 + \beta_2(\text{up_gdp}) + \dots + \beta_k X_k + \varepsilon_i \quad (2)$$

This is done to test for changes in consumer behavior caused by recessionary periods. By utilizing this variable we will be able to separate behavior from that caused by internet accessibility, income inequality, and e-commerce sales. The lagged value of PCE is utilized to test if consumers take precautionary measures. PCE is the personal consumption expenditure. It is defined as “the primary measure of consumer spending on goods and services in the U.S. economy. It accounts for about two-thirds of domestic

final spending, and thus it is the primary engine that drives future economic growth” (BEA).⁴ The lagged value was used to test the theory developed by Stephens (2001) who found increased probability of future job loss caused households to reduce their consumption well before knowledge of actual job loss occurred.

Seasonally adjusted unemployment rates (SA_UR), percent change in GDP (Change_GDP), and the log of overall retail trade figures (ln_retailtrade) were utilized to capture additional recessionary effects. Retail trade can be defined as “the re-sale (sale without transformation) of new and used goods to the general public, for personal or household consumption or utilization” (OECD).⁵ I used the values of retail trade that capture the sale of non-durable goods. The majority of goods sold within department stores are classified as non-durables.

Income Inequality Variables

To test the effect of increased income inequality on sales, two measures were utilized to measure overall inequality. The Gini coefficient is the most significant and thus our primary measure. The second inequality measure is derived according to equation (3):

$$\text{Inequality}_t = (\text{Mean Income})_t - (\text{Median Income})_t \quad (3)$$

One important property of this inequality measure is that it is derived on a quarterly basis. The Gini coefficient is an annual index. For robustness sake, both measures are utilized.

⁴ The definition of PCE was obtained from bea.gov.

⁵ The definition of retail trade was obtained from stats.oecd.org.

The logged historical price of Walmart stock prices (\ln_WLMT) can be seen as a recessionary or an income inequality variable. Marketing curriculum suggests that Walmart is a substitute store, booming during times of economic hardships. This effect could be caused by the population as a whole during recessionary times, or representative of the diminishing middle class.

Connectivity and E-Commerce

To explore the effects of internet growth on department store sales, an interaction term was created to exhibit connectivity rates. This term was created by equation (4):

$$\text{Connectivity}_t = (\text{Mobile})_t * (\text{Online})_t \quad (4)$$

The variable Mobile reflects mobile cellular subscriptions per 100 people at time period, t . The variable Online captures the number of Americans online at time t . An interaction term was created due to the high correlation between the terms.

To represent the growth of online shopping I utilized quarterly e-commerce sales and logged historical values of Amazon stock prices (\ln_AMZN). E-commerce represents any sale that is made over the internet. To tackle issues of multicollinearity, I created a proxy variable derived according to equations (5) and (6):

$$\text{E-Commerce} = \beta_0 + \beta_1(\text{Online}) + \beta_2(\text{Mobile}) + \beta_3(\text{AMZN}) + \beta_4(\ln_PCE) + u_i \quad (5)$$

From equation 5 I obtained the fitted value of β_0 and predicted the standard errors. I calculated a proxy for e-commerce using equation (6):

$$\text{E-Commerce proxy} = \beta_0^{\wedge} + u_i^{\wedge} \quad (6)$$

Summary Statistics and Correlation Coefficients

Table 1 displays basic summary statistics of the data. Note the varied frequencies of the independent regressors. The variables associated with online commerce are not made public until 2000, when the Census Bureau began publishing them in their annual Retail Trade Report. The values for retail trade were taken from this report as well. The sample for Amazon begins in 1997.

Table 1: Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent Variable					
ln_deptsales	92	11.07839	0.2218043	10.64175	11.31563
Recessionary Variables					
ln_retailtrade	60	13.89126	0.0495174	13.79674	13.97132
SA_UR	92	6.195951	1.666582	3.950649	10.07823
Change_GDP	92	2.598913	2.502987	-8.2	7.8
lag_lnPCE	91	7.692585	0.1380888	7.467772	7.898114
Income Inequality Variables					
Gini	92	0.4635217	0.0106136	0.433	0.482
MeanIncome	92	74155.06	3421.928	65526.59	78535.19
MedianIncome	92	54581.26	2165.569	50421	57843
inequality	92	20037.57	1362.15	16195	22081
ln_WLMT	92	4.109795	0.2728684	3.481174	4.829718
Connectivity and Ecommerce Variables					
Mobile	92	54.40174	33.27539	4.2	98.4
Online	60	0.7077778	0.1016931	0.52	0.84
connectivity	60	55.19354	21.04025	20.02	82.656
ecommerce	60	1.903089	0.0778968	1.670664	2.064969
ln_AMZN	70	4.247236	1.022555	1.49518	5.970244

The value of Amazon stock has a wider range than Walmart, even though Walmart has been around longer. This shows how quickly Amazon grew while Walmart stayed rather stagnant. The Gini coefficient has a much smaller range than the inequality measure derived in equation (3). This is attributable to the quarterly versus annual frequency of the measures.

The immediate effect of the recession is noticeable by viewing the minimum and maximum values of the unemployment rate (SA_UR). The unemployment rate reached 10% during the height of economic downturn. The average value is around 6%, with the minimum dropping down to 3.9% during the early 2000's. The rate was also noticeably low right before the recession of 2008.

The growth of the internet and mobile phone usage is noticeable by viewing the range in values. The number of Americans that owned a cellphone was at its lowest in 1992 at 4.2%. This drastically increased to 98% within a span of 22 years. The percentage of Americans online displays a similar exponential growth rate. In 2000, when the statistic was first collected by the Pew Research Center, only 50% of Americans utilized the internet. This grew to 84% in 2014. From 2000 – 2014, 32% of Americans began using the internet.

Table 2 represents the correlation coefficients of the dependent and independent variables. Amazon's stock price is highly negatively correlated with department store sales, with a rho value of $-.0901$. Connectivity also exhibits a similar relationship, with a coefficient of $-.9825$.

Table 2: Correlation Coefficients

	In dept sales	store	In retail trade	SA_UR	Change GDP	lag_In PCE	Gini	inequality	In WLMT	connect ecomm	In AMZN
In deptsales	1										
In retailtrade	-0.4309	1									
SA_UR	-0.6874	-0.2191	1								
Change_GDP	0.1303	0.2485	-0.0944	1							
lag_InPCE	-0.931	0.6223	0.4862	-0.1739	1						
Gini	-0.8627	0.504	0.5202	0.0401	0.8007	1					
inequality	-0.2859	0.5304	-0.0878	0.2349	0.3088	0.4717	1				
In_WLMT	0.0204	0.006	-0.1693	0.2097	-0.1616	0.2357	0.2304	1			
connectivity	-0.9825	0.4955	0.647	-0.1373	0.964	0.8204	0.2645	-0.1593	1		
ecommerce	0.0334	0.4219	-0.16	0.3935	0	-0.0605	0.3408	-0.0344	-0.033	1	
In_AMZN	-0.901	0.4491	0.5912	0.0879	0.8321	0.8106	0.328	0.1031	0.87	0	1

CHAPTER IV

RESULTS

I estimate equation (1) and (2) by Ordinary Least Squares (OLS) for recessionary effects, income inequality effects, and e-commerce and connectivity effects. At the end, I estimate equation (1) including every variable to find a model that best explains the decline of sales.

Recession Output

Table 3 displays the OLS regression results for the variables utilized to represent the effects of the great recession on department store sales.

Table 3: Recession OLS Results

	Recession OLS Results				up_GDP	down_GDP	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Change_GDP	0.0217*** (-0.007)	.0171*** (.0038)			-.0029 (.0037)	-.0043 (.0045)	-0.0021 (.0304)
SA_UR	-.0772*** (.0106)	-0.0893*** (.0054)			-.0335*** (.0079)	-.0303*** (.0095)	-0.0536 (.0418)
ln_retailtrade		-2.72*** (.2067)	.9952*** (.2168)		0.0191 (.3759)	0.0917 (.4607)	-0.6584 (2.39)
lag_lnPCE			-2.646*** (0.1291)	-1.448*** (0.0752)	-1.938*** (.2457)	-1.99*** (.2907)	-1.475 (1.642)
RMSE	0.1656	0.0746	0.06456	0.09857	0.05157	0.05081	0.07179
Adj. R2	0.4425	0.8655	0.8993	0.8041	0.9357	0.9386	0.8703

Note: Standard errors in parentheses

*** 1% ** 5% * 10% Significance

The dependent variable is the log of department store sales

The results indicate that the lag of PCE accounts for 80% of the variation in the data alone as seen in column (4). In addition, it is the most significant variable and has the strongest magnitude. Recessionary effects together account for 93% of the variation. Retail trade has a strong negative effect in regression (2), and in regression (7). This implies that even when consumers are spending more money, the inflow isn't entering the department store industry. This theory can be further verified due to the strong negative relationship between personal consumption expenditures and department store sales. Consumers are spending more money, but they are not buying goods in shopping centers. I see this as a sign of changing preferences. In the past consumers preferred to shop in shopping centers due to the convenience, social factors, and variety of goods, but no longer value these incentives due to other options that achieve higher utility.

It is interesting that the seasonally adjusted unemployment rate provides little insight into declining sales, even during periods of economic downturn. In general, none of the recessionary variables are significant in explaining declining sales during periods of economic downturns. It would seem common knowledge that increased unemployment rate occurring with economic downturn would be a significant factor into declining department store sales, but it is not the case.

Income inequality Results

Table 4 displays the OLS regression results for the variables utilized to represent income inequality.

Table 4: Income Inequality OLS Results

Income Inequality OLS Results				up_GDP	down_GDP	
	(1)	(2)	(3)	(4)	(5)	(6)
inequality	-.00005*** (.00001)		-0.00005*** (.00002)	.00007*** (.00001)	.00007*** (.00001)	-.0003** (.0001432)
ln_WLMT		-.1586* (.0840)	-.1019 (.0811)	-.1351*** (.0459)	-.1458*** (.0441)	1.08*** (.3509)
Gini				-23.27*** (1.685)	-22.79*** (.1645)	13.85 (17.588)
RMSE	0.20745	0.21875	0.2067	0.11685	0.11144	0.09407
Adj. R2	0.1253	0.0274	0.1308	0.7225	0.7408	0.7774

Note: Standard errors in parentheses

*** 1% ** 5% * 10% Significance

The dependent variable is the log of department store sales

Of the variables utilized to measure inequality, the Gini coefficient has the highest explanatory power toward the decline of department store sales. The magnitude is strong in all economic cycles, but it is only significant when the change in GDP is positive. If GDP growth is negative, the Gini coefficient is not significant. This implies that when the economy is facing negative conditions, the level of inequality present does not affect department store sales. Instead, sales are declining due to other explanatory variables.

The price of Walmart shares is inversely related with department store sales. This relationship is the strongest when GDP growth is negative. This validates the substitute goods theory, where consumers opt for other cost efficient options when facing economic hardship. Walmart is also significant during times of positive GDP growth. This can signify the changing preferences attributable to those affected by the growing income inequality gap. Those affected are experiencing declining disposable income and prefer to shop at budget friendly stores like Walmart.

The inequality measure determined in equation (3) holds a significant negative relationship with department store sales in the first three regressions. This measure does not have the strength of effect as seen with the Gini coefficient. I attribute this to the additional factors included in calculating the Gini coefficient. Although explanatory, the inequality measure calculated as the difference between mean and median income is theoretically very simple.

Connectivity and E-Commerce Results

Table 5 displays the OLS regression results for the variables representative of connectivity and e-commerce.

Table 5: Connectivity and E-Commerce OLS Results

Connectivity and Ecommerce OLS Results			up_GDP	down_GDP	
	(1)	(2)	(3)	(4)	(5)
Connectivity	-.0094*** (.0002)		-.00789*** (.0004)	-.0075*** (.00045)	-.0067*** (.0019)
ln_AMZN		-0.1772*** (.0153)	-.042*** (.0096)	-.0507*** (.0107)	-0.0617 (.0408)
ecommerce			0.0167 (0.0561)	-0.0377 (.0616)	.1667 (.2518)
RMSE	0.03816	0.12989	0.03354	0.03359	0.02697
Adj. R2	0.9648	0.6602	0.9728	0.9732	0.9817

Note: Standard errors in parentheses
 *** 1% ** 5% * 10% Significance

The dependent variable is the log of department store sales

The connectivity interaction variable created in equations (5) and (6) has a highly significant, inverse relationship with department store sales. This relationship holds when GDP is both up and down, showing that economic cycles have little impact on internet

and mobile phone usage. The innovation of the cellphone and the internet has negatively affected department store sales. This has occurred due to the ease of accessibility to online shopping, and the changing preferences of younger generations. Shopping malls used to be a social hotspot, where young people would go to meet friends and spend free time. This has been replaced with social media and online entertainment, and the draw of “hanging out at the mall” isn’t as strong.

Overall e-commerce sales have a surprisingly small impact on department store sales. Instead, the price of Amazon shares demonstrates how internet shopping has affected shopping centers. Amazon's success is inversely related to department store sales, and is significant in regressions (1) – (3). The variable loses its significance when GDP growth is negative. This reinforces a relationship that has been present in each section of results. When the country is facing economic downturn, there is not a specific variable that can account for the declining sales of department stores. The economy as a whole suffers and the every industry is affected, not just department stores.

The success of Amazon is attributable to changing preferences, ease of use, and a higher chance of consumers maximizing their utility. Department stores and shopping centers in general do not offer the variety or cost efficiency available through big box internet retailers like Amazon. During periods of positive GDP growth, connectivity and e-commerce variables are able to explain 97% of the variations in the dependent variable. The changing scope of society and the preferences that have become the norm do not create a profitable environment for shopping centers.

Combined Results

Table 6 displays the OLS results found using equation (1) including every variable of interest.

Table 6: Combined Effects OLS Results

	Combined OLS Results				
	(1)	(2)	(3)	(4)	(5)
Change_GDP	-0.0029 (.0037)			.00279** (.0012)	.0027*** (.0009)
SA_UR	-0.0335*** (.0079)			0.0023 (.0034)	
ln_retailtrade	0.0191 (.3759)			.5663*** (.1387)	.5280*** (.0529)
lag_lnPCE	-1.938*** (.2457)			0.0966 (.1381)	
inequality		.00007*** (.00001)		4.97E-07 (3.25e-06)	
ln_WLMT		-0.1351*** (.0459)		-0.1534*** (.0222)	-0.1608*** (.0201)
Gini		-23.27*** (1.685)		-3.258*** (.8762)	-2.9464*** (.6944)
ecommerce			0.0167 (.0562)	-0.2022*** (.0367)	-0.1931*** (.0296)
connectivity			-0.0078*** (.0004)	-0.0092*** (.00056)	-0.0088*** (.0003)
ln_AMZN			-0.0421*** (.0096)	-0.0181 (.0055)	-0.0170*** (.7064)
RMSE	0.05157	0.11685	0.03354	0.01457	0.01428
Adj. R2	0.9357	0.7225	0.9782	0.9949	0.9951

Note: Standard errors in parentheses

*** 1% ** 5% * 10% Significance

The dependent variable is the log of department store sales

Columns (1), (2), and (3) represent the results discussed earlier within this section.

Column (4) is a regression including all of the variable of interest. When including every

variable the results explain 99% of the variations in department store sales. Through use of a stepwise regression, column (5) drops the variables that are not significant and increases the explanatory power by .02. This is the best model, and has the highest adjusted R^2 of any prior regression. The RMSE is very low, and every variable is significant at the 1% level.

Every variable used to test connectivity and e-commerce is present in column (5). This suggests that of the three types of threats that are affecting department store sales, the growth of online shopping and the innovation of mobile phones and the internet is the leading cause toward declined sales. The theory of Income inequality is relevant because it offers significant explanation with the Gini coefficient. Of the variables included in the final regression, the Gini coefficient offers the best explanation of declining department store sales. A one unit change of the Gini coefficient causes a 2.9% decrease in sales.

The least effective of the three hypotheses is the great recession and its effect on sales. Holding with the results discussed earlier, the seasonally adjusted unemployment rate consistently offers little explanation into the decline of sales. The results in column (5) show that a positive change in GDP has an upward effect on department store sales.

When viewing recessionary effects alone, this relationship is the opposite. Either way, the magnitude is weak and changes in GDP do not have a significant effect on department store sales. The strongest of the recessionary variables is the value of retail trade.

However, this variable doesn't explain declining sales, as it has a positive relationship with department store sales.

CHAPTER V

CONCLUSION

The objective of this study is to determine which type of societal or economic change has the largest impact on shopping center closures. The strongest of the variables are those demonstrating the growth of connectivity and e-commerce. The internet has caused many changes in society, and shopping centers have become obsolete as a repercussion. Income inequality also offers explanation as to the closures. Those effected by the increasing gap are within the target demographic of shopping centers. The increasing gap has caused declining sales because the target demographic has decreased disposable income. The recession offers slight insight into the declined sales, but rather instead offers insight into what happens to society as a whole during poor economic conditions. By utilizing government provided data and constructing a data set ranging from 1992 – 2014, I find that there is not one single reason behind the disappearance of department stores. This study is a contribution to the broader literature on income inequality, consumer behavior, recessionary effects, and e-commerce/connectivity growth. Rather than believing assumptions as to why shopping centers are closing, with this study we can instead see that it is due to a variety of causes. It is a combination of changes in society, preferences, economic conditions, and demographic makeup.

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