ASYMMETRIC IMPACT OF ADVERTISING REVENUES ON CONSUMER BEHAVIOR: A BIVARIATE APPROACH

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Abstract

There is very little research in the extant literature on the asymmetry that may exist in consumers reactions to changes in the aggregate level of advertising in the marketplace. Aggregate levels of advertising act as a signal to consumers regarding the health of the economy. In this study, we investigate the extent of this asymmetry in terms of how consumer confidence, which is a proxy for future consumer spending, responds to upturns and downturns in advertising revenues. We find that consumers react with higher levels of confidence to upturns in advertising revenues. However, consumers do not react to downturns in advertising revenue with commensurate reductions in consumer confidence. They ignore the signaling effects of a downturn in advertising revenues, displaying asymmetric behavior in response to changes in advertising revenue. The increase in consumer confidence resulting from an increase in advertising revenue is a delayed response effect and comes after two quarters lag. It is statistically significant at conventional levels for the following two quarters as a response to a one-time upturn in advertising revenues. The results provide important information to practitioners and researchers on the asymmetric signaling and ratchet effects of advertising on consumer behavior. The implication for practitioners and policy makers is that aggregate increases in advertising has a delayed positive effect on consumer confidence with positive implications for consumer spending. The implications for researchers is another example of asymmetry in human decision-making and specifically the tendency to embrace positive and ignore negative economic signals. The implication for investors is a better understanding of how macro advertising expenditures function as a leading indicator for consumer confidence, consumer spending, and economic growth.

Keywords: asymmetric impact, advertising, consumer behavior
JEL Classification: M37

Introduction and conceptual background

There is very little research in the extant literature on the asymmetry that may exist in the way consumers react to changes in the aggregate level of advertising in the marketplace. The rational for the essential idea that aggregate levels of advertising influence consumer confidence should not be assumed in advance. The null hypothesis is that aggregate levels of advertising have no effect on consumer's behavior. Then the data is analyzed and the

analysis results do not support the null hypothesis. Analysis results report that aggregate levels of advertising influence consumer behavior. The asymmetric effects observed in the analysis results may reveal important information to policymakers, practitioners, and investors.

This research work provides the following novel and unique contributions to the current consumer behavior research works literature. First, we investigate asymmetries in consumer confidence by investigating how consumers respond to upturns and downturns in aggregate levels of advertising revenues. Second, we use a vector autoregression model to investigate the direction and durability and changes in consumer confidence after changes in macro advertising expenditures. Third, we divide macro advertising expenditures into two components, one consisting only of upturns and another consisting only of downturns. Then, we induce one-standard deviation increase in each series and examine how consumer confidence responds to each series.

The theoretical framework that is foundational to this study is the following macro effects of advertising and consumer confidence. Aggregate advertising expenditures in the economy serve as signals or cues to consumers and have an impact on their confidence in the economy regarding perceptions of economic expansion or retraction and thus consumer spending (Corrado et al., 2009). When consumers see more advertising their confidence increases and consumer spending increases. When consumers see less advertising, their confidence wanes and they spend less.

The level of advertising expenditures in the economy is measured in this study by the operational (proxy) variable (USADV) found in Datastream, which is the employment revenues from advertising services of advertising agencies, i.e. advertising expenditures. USADV is widely accepted as a valid proxy for aggregate advertising spending. Consumer confidence is measured via the Datastream variable CCONS. Consumer confidence has an effect on consumer spending from advertising services, proxy for consumer behavior is consumer confidence (CCONS). We hypothesize that in the aggregate advertising expenditures serve as an implicit leading indicator signal to consumers regarding the health of the economy. When advertising expenditures increase, consumers perceive a growing economy, their confidence in the economy increases and consumer spending increases. When advertising expenditures decrease, consumers perceive a slowing economy, their confidence in the economy decreases and a lag is observed in consumer spending decrease. We observe that the signaling effect of advertising expenditures on consumer confidence to have a lagged effect. We also observe that the possibility of asymmetrical responses in consumer confidence is influenced by changes in advertising expenditures.

We find that consumers react more to upturns in advertising expenditures than they do to downturns. Consumer confidence increases, after a lag effect, when advertising expenditures increase. However, consumer confidence does not decrease in response to downturns in advertising, displaying ratchet response downward. Further, the delayed response effect to upturns in advertising expenditures comes after two quarters lag and is found to be statistically significant at the conventional levels for the two quarters that follow to a once and for all change in an upturn in advertising expenditures.

The results provide important information to practitioners, policymakers, and researchers regarding the impact of advertising expenditures on consumer confidence and ultimately consumer spending. Increases in advertising expenditures appear to serve as implicit signals to consumers that the economy is growing and this results in an increase in consumer confidence lagged after two quarters and stable after xyz.

The implication for policy makers is that increases in advertising expenditures have a lagged positive impact on consumer confidence and consumer spending and thus serves as a leading indicator regarding economic growth and serves as another piece of information in managing that growth via interest rates and monetary supply. Implications for practitioners are that advertising in the aggregate has a lagged positive impact on consumer confidence and consumer spending and the challenge is to find the most effective and efficient advertising strategy for a given firm.

In the face of decreasing advertising expenditures, consumers do not decrease their consumer confidence. If the relationship between advertising expenditures and consumer confidence was symmetrical, one would expect that consumer confidence would be commensurately negatively affected by decreases in advertising expenditures. This was not the case. There was a ratchet effect of advertising expenditures on consumer behavior.

Reductions in consumer confidence due to reductions in advertising expenditures were sticky on the way down. There was no implicit signaling from decreases in advertising expenditures causing consumers to reduce their levels of confidence. on the asymmetric signaling and ratchet effects of advertising on consumer behavior. It appears that consumers do not want to change their spending habits after a downturn in advertising expenditures. Why consumers would be liberal relative to spending in the face of signals indicating a possibly contracting economy is an asymmetric response that warrants more study.

As the literature review revealed asymmetry in decision making generally, and economic and consumer behavior literature specifically is complicated and it is difficult to find a grand theory to capture the disparate findings. The implication for policy makers may be a better understanding of how advertising expenditures function as leading indicator of consumer confidence and spending. Consumers are slow to scale back confidence in the face of signals such as advertising expenditures. Policy makers should not overreact to decreases in leading indicators such as advertising expenditures. Of course, other leading indicators may have a positive impact on consumer confidence.

The implication for practitioners, at least from a macro perspective, is that decrease in advertising expenditures do not have an immediate effect on consumer confidence and consumer spending and this may also be true at the firm level to some degree for some short period of time. Clearly, this notion needs more research.

For researchers studying asymmetry in economic decision-making, this is another example of how human beings vary from simple rational decision-making. Why would the implicit impact of an increase in advertising revenue on consumer confidence vary asymmetrically from a decrease in advertising expenditures? Consumers maintaining their confidence in the face of negative signaling is counterintuitive, especially given that negative

repercussions from overspending in an economic downturn are much worse than underspending in an economic upturn. Obviously, at some point in an economic downturn consumers reduce spending. Does this only happen when they suffer income losses? Are there more powerful leading indicators that affect consumers to reduce confidence before income losses? Are there combinations of leading indicators that have an additive effect on consumer confidence beyond one such as advertising expenditures? Consumers increase their spending patterns as they are exposed to upturns in advertising revenues, which signal even more advertising and consumer spending activity.

1 Literature review

A variety of social science and marketing research report findings of asymmetrical decision-making reflect a deep level of complexity that contradicts straightforward models of homo economicus. For example, psychology and marketing research evidence indicates a fundamental asymmetry in consumer decision-making and consumption behavior (Tversky & Kahneman, 1991, 1992). For example, in response to negative news about decreases in future income consumers were more resistant to lowering consumption when compared with their resistance to increasing consumption in response to positive news regarding their future income (Bowman et al., 1999). This phenomenon concurs with Prospect Theory according to which a fundamental asymmetry in the evaluation of consumption increases and decreases is the basis for many instances of consumer dependence on reference points (Kahneman & Tversky, 1979). Therefore, consumers are far more emotionally invested, sensitive and care about losses in relation to their reference point, which reflects their current standard of living, than about profits (Tversky & Kahneman, 1992). Therefore, consumers exhibit a loss aversion behavior by being risk averse in potential losses which may reduce their consumer spending, standard of living and consumer confidence.

A similar behavior, being risk averse in potential losses, is observed in investment activity (Bowman et al., 1999). For example, one dollar for a homeless human being is far more meaningful and valuable than a dollar for a billionaire (Hansson, 1988; Rabin, 2013). A consumer with constant relative risk aversion utility is very likely to reject risk involved enterprises even if the probable loss is a few thousand dollars and the potential gain is hundreds of millions dollars (granted that currently probability of gaining millions dollars is very low) (Barberis et al., 2006; Kőszegi & Rabin, 2007). Asymmetric consumer behavior is also evident in durables, non-durables, and services (major components of consumption) (Baghestani & Kherfi, 2015).

Psychological negativity bias (human nature sustains far greater impact from negative than positive news) may also explain to a certain extent assymetric consumer behavior (Ito et al., 1998; Skowronski & Carlston, 1989; Rozin & Royzman, 2001; Vaish et al., 2008). Interest rate effect also impacts assymetric consumer behavior. For example, when *x* occurred there was *y* asymmetry because of *abc*. When *z* occurred there was an interest rate effect, where fewer consumers were able to afford to purchase a non-durable.

Carpenter et al. (1988) report that asymmetric competition can arise because of differences in the vulnerability of one brand to the efforts of others, and the temporal distinctiveness of brands' marketing efforts. These asymmetries are compounded by marketing dynamics,

including cumulative advertising spending. Therefore, the outcome of any brand strategy fundamentally depends on the diversity of competitive patterns that exist.

Researchers describe a diversity of specification alternatives (cross-competitive effects, dynamic attraction components, and ways to represent the distinctiveness of competitive position), as well as estimation methods to model asymmetric competition and design effective competitive strategy (Nerlove & Arrow, 1962; Carpenter et al., 1988). Rucker et al. (2012) report how the possession or lack of power has a very significant impact on psychology, perception, cognition, and behavior of consumers. Power possession causes the individual to act autonomously, dominantly as an agent (agency behavior) and avoid submission to anyone. Lack of power causes the individual to think and act with no autonomy, only after consideration of others, (communal behavior) with sensitivity and participation in a greater social group such as family, University, business, society (Rucker et al., 2012). Pitelis (1991) reported that advertising and investment impact aggregate profits at a macroeconomic level (Pitelis, 1991). Carruth and Dickerson (2003) report evidence of the ephemeral nature of assymetric consumer behavior (Carruth & Dickerson, 2003). Rucker et al. (2010) report how psychological states of power influence consumer spending behavior for self or others (Rucker et al., 2010).

Kurt et al. (2011) report that consumer spending is expensive for males shopping with friends but not for females (Kurt et al., 2011). Morgan (1993) reports that switching from tight to relaxed monetary policy causes asymmetric effects for the economy (Morgan, 1993). Numerous studies report that taxes, stocks, house and oil prices significant changes cause asymmetric effects for consumer spending behavior and for the economy (Hamilton, 2003; Bernanke, 1983; Mehra & Petersen, 2005; Watanabe et al., 2001; Mishkin, 1995; Paiella, 2009; Greasley et al., 2001; Carruth & Henley, 1990; Edelstein & Kilian, 2009; Granger & Lee, 1989; Stevans, 2004; Apergis & Miller, 2006; Agarwal et al., 2015).

2 Data and Methods

2.1 A simple Keynesian model of employment and interest rates

In a simple closed economy Keynesian framework, the familiar consumption function can be expressed as:

$$C = a + bYd + cINF, \quad (1)$$

where Yd is disposable income, C is consumption expenditure and INF is consumers' information set. Consequently, INF can be expressed as a function of advertisement A in the following way:

$$INF = m + nADV, \quad (2)$$

where ADV depends on a representative company's revenues from advertising AR and sales S as:

$$ADV = \alpha + \gamma AR \quad (3)$$

Simple substitution and rearranging yields:

$$C = cn\gamma AR \quad (4)$$

where,

$$\delta C / \delta AR = cn\gamma \text{ where } c \geq 0, n \geq 0 \text{ and } \gamma \geq 0 \quad (5)$$

Defining AR_{it} has upturn and AR_{jt} as downturn in AR, an asymmetry occurs when:

$$AR_{it} = AR_t > AR_{t-1} \quad (6)$$

$$AR_{jt} = AR_t < AR_{t-1} \quad (7)$$

Thus, consumers' expenditure function can be traced in a bivariate framework in which the response of consumers can be measured in a way attributable to changes only to changes in advertising revenues where one can conjecture that AR_{it} is an upturn while AR_{jt} is a downturn in advertising revenues.

2.2 Econometric methodology

Sample investigated covers a period of about 2 decades from the 4th quarter of 1998 - 2nd quarter of 2018. Datastream provides all data in quarterly frequency. The proxy variable used for advertisement is (USADV) for the employment revenues from advertising services, and the proxy for consumer behavior is consumer confidence (CCONS), while the analysis method uses the vector autoregression model (VAR) (Doan, 1990; Sims, 1980; Hamilton, 1995). The VAR model can be expressed as:

$$Z(t) = C + \sum_{s=1}^{m} A(s)Z(t-s) + e(t) \quad (8)$$

Unit root tests are employed to analyze the time series properties of the data. We model the postulated asymmetry in advertising revenues by dividing the original series into two components in the following way, upturn in advertising revenues, if $X_1 < X_2$, X_2 otherwise, 0 and downturn in advertising revenues, if $X_1 < X_2$, X_1 otherwise, 0.

The time series properties analysis reveal that all series appear to be stationary in the form of first differences but do not appear to be cointegrated at a level. Therefore our estimations utilize series in the form of differences rather than in levels. Cointegration test using the Johansen's approach (1988) did not point to any existence of long-run linear relationships between the two variables. In this section, we estimate a bivariate VAR model and obtain impulse response functions using Monte Carlo integration of 1000 draws to come up with 95 percent upper and lower confidence bands for statistical inference, since conventional t-values from the VAR estimations are void. When the upper and lower bands carry the same sign the IRF becomes statistically significant at the 95 percent confidence level.

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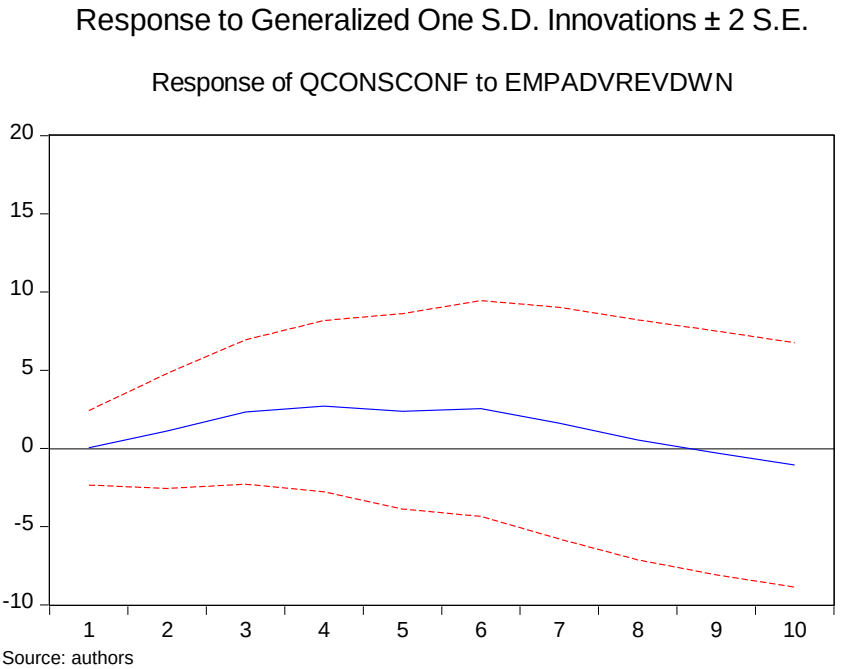
3 Results

Figure 1 plots the impulse response of consumer confidence to a one-time standard deviation shock in the downturns in advertising revenues. Since the lower confidence band carries a different sign that upper response, the impact of the advertising revenue on consumer confidence does not appear to be statistically significant. The cumulative magnitude of this impact from Table 1 is much less than that of the response of consumer confidence to upturns in advertising revenue. Both results point to evidence consistent with the view that consumers do not wish to change their consumption habit after a downturn in advertising revenues.

Figure 1 | Response to generalized one SD innovations ±2SE



Source: authors

Table 1 | Vector Autoregression Estimates

Vector Autoregression Estimates

	EMPADVREVDWN	QCONSCONF
EMPADVREVDWN(-1)	0.438706	22.25096
	(0.16274)	(27.5335)
EMPADVREVDWN(-2)	0.258054	13.84204
	(0.17606)	(29.7878)
EMPADVREVDWN(-3)	0.061576	-8.404511
	(0.17779)	(30.0804)
EMPADVREVDWN(-4)	-0.186130	-20.56368
	(0.17038)	(28.8263)
EMPADVREVDWN(-5)	0.000677	2.938738
	(0.16479)	(27.8806)

EMPADVREVDWN(-6)	-0.130019	-12.17211
	(0.15438)	(26.1186)
QCONSCONF(-1)	0.001090	1.055718
	(0.00102)	(0.17275)
QCONSCONF(-2)	-0.002865	-0.149957
	(0.00142)	(0.24076)
QCONSCONF(-3)	0.001595	0.294659
	(0.00146)	(0.24689)
QCONSCONF(-4)	-0.000351	-0.067483
	(0.00146)	(0.24724)
QCONSCONF(-5)	0.000935	-0.281014
	(0.00146)	(0.24686)
QCONSCONF(-6)	-0.000390	0.076967
	(0.00106)	(0.17875)
C	0.000747	6.007121
	(0.03005)	(5.08377)
R-squared	0.467754	0.902553
Adj. R-squared	0.285269	0.869143
F-statistic	2.563251	27.01420
Log likelihood	84.54939	-161.7393
Akaike AIC	-2.981224	7.280803
Schwarz SC	-2.474441	7.787587
Log likelihood		-77.18950
Akaike information criterion		4.299562
Schwarz criterion		5.313130

Source: authors

Figure 2 plots the response of consumer confidence to a one-time standard deviation shock in the upturns in advertising revenues. The response is statistically significant and higher in terms of cumulative responses than the response of downturns in advertising revenues as displayed in Table 2. The response appears to be clearly asymmetric when both IRFs are compared. The increase in consumer confidence due to an increase in upturns in advertising revenue is positive and statistically significant and higher in cumulative terms than the increase in downturns in advertising revenue.

Table 2 | Vector Autoregression Estimates

Vector Autoregression Estimates

	EMPADVREVUP	QCONSCONF
EMPADVREVUP(-1)	0.265672	59.66691
	(0.16635)	(29.0531)
EMPADVREVUP(-2)	0.116957	5.910228
	(0.14805)	(25.8575)
EMPADVREVUP(-3)	0.082632	-12.19694
	(0.14103)	(24.6300)
EMPADVREVUP(-4)	-0.265361	-41.72508
	(0.13706)	(23.9381)
EMPADVREVUP(-5)	0.051254	40.51046
	(0.14471)	(25.2739)
EMPADVREVUP(-6)	-0.084813	34.17316
	(0.14255)	(24.8958)

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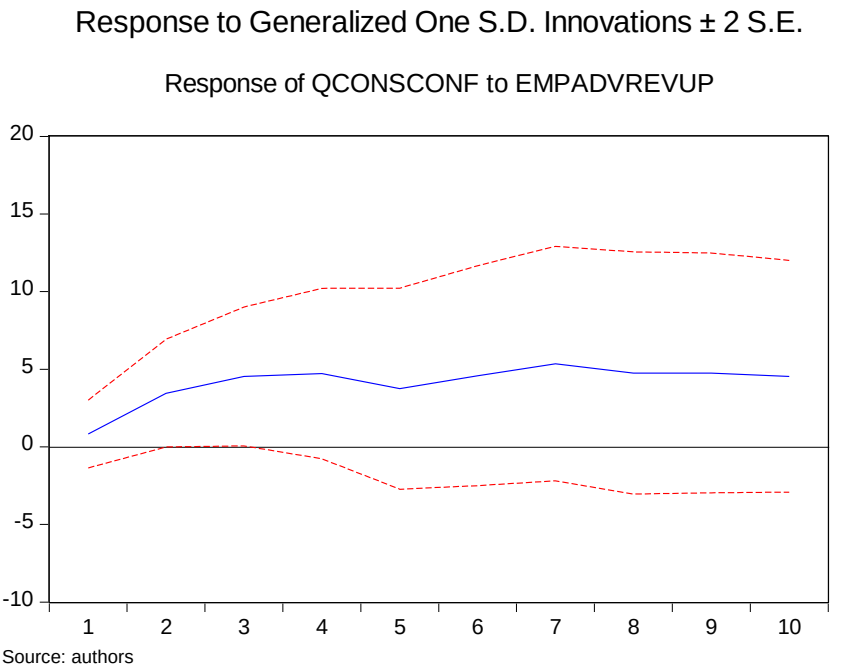
QCONSCONF(-1)	-0.001027	1.055299
	(0.00093)	(0.16170)
QCONSCONF(-2)	0.001087	-0.010376
	(0.00132)	(0.23032)
QCONSCONF(-3)	-0.000737	0.149994
	(0.00127)	(0.22104)
QCONSCONF(-4)	0.003421	-0.095428
	(0.00126)	(0.21931)
QCONSCONF(-5)	-0.003936	-0.545695
	(0.00138)	(0.24114)
QCONSCONF(-6)	0.000971	0.378763
	(0.00103)	(0.17960)
C	0.042117	2.951682
	(0.02828)	(4.93870)
R-squared	0.337361	0.917706
Adj. R-squared	0.110170	0.889491
F-statistic	1.484925	32.52551
Log likelihood	90.13062	-157.6830
Akaike AIC	-3.213776	7.111791
Schwarz SC	-2.706992	7.618575
Akaike information criterion		3.886159
Schwarz criterion		4.899726

Source: authors

Figure 2 | Response to generalized one SD innovations ±2SE



Source: authors

Further the responses in Figure 2 become statistically significant with a delay of two periods and remain statistically significant for two periods showing consumers' delayed response effect when it comes to spending and willingness to increase their spending after a an increase in advertising revenue. However, consumers are reluctant in cutting back their spending when advertising revenue decreases.

Table 3 | Response of qconsconf

Response of qconsconf to

Period	EMPADVREVDWN	EMPADVREVUP
1	0.033712	0.821733
	(1.18881)	(1.08926)
2	1.118799	3.452998
	(1.83965)	(1.73390)
3	2.325959	4.528187
	(2.31000)	(2.23744)
4	2.698044	4.713771
	(2.73524)	(2.74385)
5	2.366438	3.741279
	(3.12037)	(3.23666)
6	2.545434	4.573452
	(3.44727)	(3.54241)
7	1.608460	5.354673
	(3.70613)	(3.77413)
8	0.540511	4.746679
	(3.83679)	(3.90235)
9	-0.295250	4.755858
	(3.89451)	(3.86286)
10	-1.063526	4.541643
	(3.90557)	(3.73382)
Total for the first 5 periods: 8.54		Total up for the first 5 periods: 17.25

Source: authors

Conclusions

In this paper, we investigate whether upward and downward movements in advertising expenditures have different impacts on consumer spending as proxied by consumer confidence. Findings reveal asymmetric consumer spending in response to changes in advertising expenditures. In particular, consumer confidence responds more to a one-time shock to upturns in advertising revenues than they do to a similar shock to downturns in advertising revenues. Further, the response of consumer confidence to upturns in advertising revenues comes with a lag and remains statistically significant for two periods displaying persistence. However, there is no statistically significant response of consumer confidence to a downturn in advertising revenues consistent with the view that consumers do not change their consumption in downturns are willing to increase consumption when advertising revenues increases.

The results have important implications for policymakers, practitioners, and investors in terms of factoring in this asymmetry and the ratchet effect in their decision-making. One implication for policy makers is a better understanding of how advertising expenditures

function as leading indicator of consumer confidence and spending. This study found that increases in advertising expenditures have a lagged positive impact on consumer confidence and consumer spending and thus serves as a leading indicator regarding economic growth and serves as another piece of information in managing that growth via interest rates and monetary supply. For example, policy decisions to decrease consumer spending to cool off the economy in the face of an inflationary threat may find that more difficult during a time when advertising expenditures are increasing. Consumers are slow to scale back confidence in the face of signals such as increasing advertising expenditures. Policy makers also should not overreact to decreases in leading indicators such as advertising expenditures, given this analysis shows that consumers did not reduce confidence (and presumably spending) in the face of reduced advertising expenditures. Of course, other leading indicators may have differing and/or additive effects on consumer confidence and should be investigated and considered.

The implication for practitioners, at least from a macro perspective, is that a decrease in advertising expenditures did not have an immediate effect on decreasing consumer confidence and consumer spending and this may also be true at the firm level to some degree for some short period of time. Clearly, this notion needs more research. Additionally, this research shows practitioners that advertising in the aggregate has a lagged positive impact on consumer confidence and consumer spending and a given firm's challenge is to find the most effective and efficient advertising strategy for their organization. However, the unsurprising finding is that advertising expenditures have a positive effect on consumer confidence and by extrapolation spending.

An implication of this research for investors is that they may receive better returns investing in industries where the aggregate level of advertising is increasing and having a positive impact on consumer spending in that industry. However, this research did not investigate the relationship between advertising expenditures and consumer confidence within industries. Further research will be necessary to verify if the macro relationships uncovered in this study are present at the industry level. Additionally, it may also be true that investing in those companies that continuously increase their advertising revenues may yield greater returns in the long run. This notion also needs confirmation by studies on advertising expenditures by individual firms. For researchers studying asymmetry in economic decision-making, this is another example of how human beings vary from simple rational decision-making. Why would the implicit impact of an increase in advertising revenue on consumer confidence vary asymmetrically from a decrease in advertising expenditures? Consumers maintaining their confidence in the face of negative signaling is counterintuitive, especially given that negative repercussions from overspending in an economic downturn are much worse than underspending in an economic upturn. These findings are also counter to a number of studies cited in the literature review. Obviously, at some point in an economic downturn consumers reduce spending. Does retrenchment only happen when consumers suffer income losses? Are there more powerful leading indicators that when they turn negative cause consumers to reduce confidence and change spending before actual income is reduced? Are there combinations of leading indicators that have an additive effect on consumer confidence beyond one such as advertising expenditures? These are interesting research questions that warrant study to improve decision making by policy makers and practitioners.

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