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THE IMPACT OF LOCAL MEDIA PESSIMISM ON RESIDENTIAL REAL ESTATE MARKETS

BY

CHANGHA JIN

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

Of

Doctor of Philosophy

In the Robinson College of Business

Of

Georgia State University

GEORGIA STATE UNIVERSITY
ROBINSON COLLEGE OF BUSINESS
2009

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ACCEPTANCE

This dissertation was prepared under the direction of the candidate's Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor in Philosophy in Business Administration in the Robinson College of Business of Georgia State University.

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Thank you, God, for your plans for me with all of above through my visible life.

ABSTRACT

The Impact of Local Media Pessimism on Residential Real Estate Markets

By

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April 20, 2009

Committee Chair: Dr. Julian Diaz III

Major Department: Real Estate

Abstract

The behavior of real estate market decision makers is a function of, among other things, the set of available information. Quality decision making in real estate is therefore to some extent dependent upon quality information. Relative to other markets, the residential real estate market can be characterized as dominated by occasional decision makers relying upon unsophisticated information often acquired from the public media rather than from esoteric sources. However, the precise nature of the relationship between the content of newspaper as public media and activity in the real estate market is largely unexplored..

The Nobel Prize winning work of Simon (1978) and Tversky and Kahneman (1974,1982 1984, and 2000) has set the stage for this research that examines actual problem solving behavior adopted by people while processing the content of newspaper about residential real estate markets. In addition, affect heuristics were studied by Slovic (2002). An affect heuristic occurs when a decision maker is influenced by the emotional content of information. In such a case deliberative analytical decision processing is replaced by quicker, easier, and more efficient emotional processing that may be contrary to logic and introduce bias. In the study, the affect heuristic provides the theoretical basis for studying the relationship between the emotional content of local media information and decision making in the residential real estate market. To what extent does pessimistic phrasing in the local news media, such as "residential market crash," "bursting housing market bubble," and "housing crisis," as opposed to

optimistic phasing, such as "hot real estate market" and "soaring home prices", shape market perceptions and influence the decisions that home buyers and sellers make?

The research also seeks to measure the "framing effect" of news on activities in the real estate market. It is posited that the way local real estate news is framed influences sale prices and the number of pending sales. A behavioral approach is used to understand the underlying relationship between a residential real estate market and a news article to audiences; an effect called frame setting. The study explores how the opinions of an individual are affected by framing, or agenda setting, by investigation of how a positive or negative portrayal of information on the residential real estate markets affects individual perception about the residential real estate market. It is conjectured that when a news article about the real estate market is pessimistic, there would be more downward pressure on the market through relative pessimistic market perception compared to when a news article is more optimistic and includes supportive descriptive statistics on the current real estate market.

To investigate these suspected beliefs, the relationship between the content of a local newspaper and residential real estate market activity is studied. Data is generated to test the affects heuristic hypothesis by employing the contents analysis program 'General Inquirer (GI)' to evaluate the contents of real estate articles in a local newspaper, the Atlanta Journal Constitution. Data generated from a controlled experiment are used to test the hypothesis about framing effects.

A data evaluative method, Vector Error Correction Modeling (VECM,) is used to determine if there is a long-run equilibrium relationship among our research variables, the pessimistic word usage and optimistic word usage in news content, and the real estate market activity which is home price and number of home sales. A two-samples mean tests is also applied to test the hypothesis generated from the theory of framing. The use of VECM is helpful not only to specify a long-run equilibrium but also in clarifying theshort-run error correction model.

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The Impact of Local Media Pessimism on Residential Real Estate Markets

Changha Jin *
Georgia State University

This version: May 28, 2009

Abstract

This study uses content analysis and a controlled experiment as data generation methods to investigate the precise nature of the largely unexplored relationship between the content of real estate news and activities in the real estate market. The theoretical base of the research is Kahneman's two system view (2003) of cognitive processing, which is applied to an individual's decision-making about the residential real estate market. The affect heuristic provides the theoretical basis for studying the relationship between the emotional content of local media information and decision making in the residential real estate market. The research question seeks to measure the "framing effect" of news on real estate market activity. It is posited that the way local real estate news is framed will influence transaction prices and the number of pending sales. A behavioral approach is utilized to understand the underlying relationship between a residential real estate market and a news article to audiences; an effect called frame setting. It is conjectured that when media coverage about the real estate market is negative there is more downward pressure on the market compared to when media coverage is more objective and includes descriptive statistics on the current real estate market.

Keywords: Residential Real Estate; Home Price; Home Sales; Affect Heuristics; Two System View of Cognitive Processing; Framing; Public Media; News Article.

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CHAPTER ONE

Introduction

Purpose of the Study

A growing body of literature[1] contends that the content of public media has an effect on an individual's psychology, which in turn has an impact on public perceptions of the economy and equity market. However, the precise nature of the relationship between the content of real estate news and activity in the real estate market has been largely unexplored. The link between the aforementioned relationship and the idea of irrationality and heuristics suggests a novel research approach within the behavioral paradigm for explaining activities in the residential real estate market.

Individuals who adopt a behavioral approach in explaining activities in the real estate market believe a residential real estate market can be partly explained by irrationality. Investors and home buyers become increasingly confident of their purchase as an investment (overconfidence bias) and they rely on short term, myopic information about the future when evaluating future appreciation in value and interest rates.

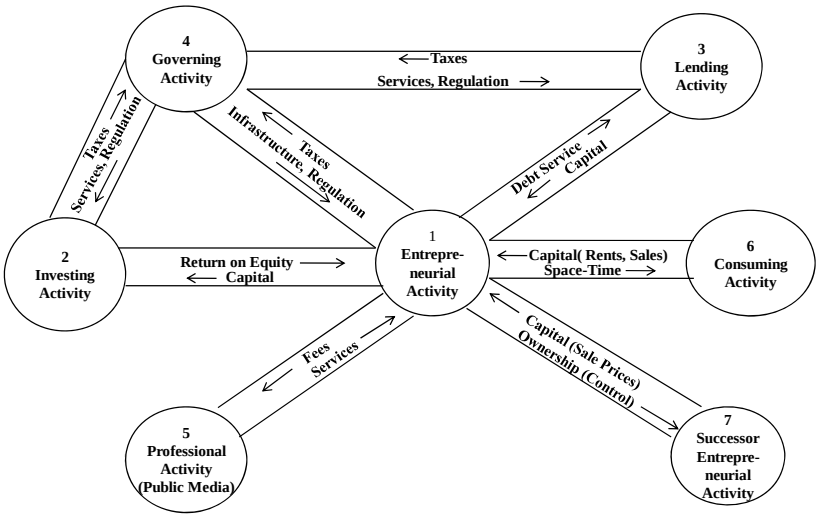
In Case and Shiller's (2003) analysis of the public perception of the residential real estate market, the authors find that the popular press is filled with information about real estate. According to Case and Shiller the expectation of large price increases may have a strong impact on demand if people believe that home prices are very unlikely to drop and certainly not likely to

[1] The detail of previous literature will be discussed in Chapter 2 including Gross and D'Ambrosio (2004), Aday (2006)), Tetlock(2007), Tetlock et al(2008), and Soroka(2006)

drop for long. In this situation, there is little perceived risk associated with a single–family residential investment.

The foundation of the research, identifying the underlying relationship between the content of newspapers and residential market activities, stems from the phenomena observed in activity models defined by Diaz (1993). In Diaz's models, the framework or territory for the real estate discipline is provided by the activities model illustrated in figure 1.

Figure 1 : Real Estate as a System of Activities Linked by Markets



Source : Diaz (1993)

The hypothesis formulated is that there is a relationship between the content of local news about the residential real estate market and a home buyer's perception of the residential real estate market. Thus, the professional and entrepreneurial activities (shown in figure 1) are critical components in the study. An attempt is therefore made to identify a source of real estate information that could help people make an intuitive judgment (Kahneman 2003) about the residential market, an intuitive judgment positioned between the automatic operations of

perception and the deliberate operations of reasoning. For example, the stock market has been described as an information game; the basic principle of an efficient market is the more information, the better. In inefficient markets, superior information is the key to above average returns, and those who have this information are wise to hoard it. This is also applicable to the real estate industry. It is a network of arrangements and relationships functioning to transmit information about products and prices so that buyers and sellers of real estate can make rational decisions and conduct informed real estate trades.

However, it is necessary to raise a fundamental philosophical question: how many of our families and friends access the same information used by fund managers and individual investors, who also have a better understanding of specialized financial language? Relative to other markets, the residential real estate market can be characterized as dominated by occasional decision-makers relying upon unsophisticated information often acquired from the public media rather than more esoteric sources. Thus, it is assumed assume that the behavior of real estate market decision makers is a function of, among other things, the set of available information. Quality decision-making in real estate is therefore to some extent dependent upon quality information.

Because modern technology has generated a significant amount of academic information about real estate, more data are readily available to homebuyers, brokers and investors. Essentially, this information contains various useful guides from applied mathematics, including hedonic pricing and Bayesian probability models to support people in making rational judgments. However, the difficulty in interpreting this information skillfully, particularly in the residential real estate market, has been largely ignored. Due to human processing limitations and the need

for efficiency, people may often bypass formal statistical forecasting procedures when making judgments and thus they act as intuitive statisticians.

In this sense, the study is based on a behavioral approach to understanding activities in the residential real estate market. It is assumed that unsophisticated investors in the residential real estate market have a limited capacity to sort and analyze a complex task; and therefore they utilize cognitive heuristics or other problem solving shortcuts. It is argued that the processing of all available residential market information often involves complex issues calling out for complex and ill-structured cognitive processing which thereby increases the possibility that people will employ cognitive short cuts. The media, for example a local newspaper, may have a significant effect on an individual's use of heuristics by providing readily available, easily processed and emotionally laden content. This provides the theoretical basis for the study.

Research Questions

The affect heuristic provides the theoretical basis for studying the relationship between the emotional content of local media information and decision making in the residential real estate market. This leads to the research questions (RQ1) and (RQ2):

Research Question 1: How does pessimism in the media effect housing prices?

Research Question 2: How does pessimism in the media affect the number of home sales?

The research question also seeks to measure the "framing effect" of news on activities in the real estate market. It is posited that the way local real estate news is framed will influence people's perception on the residential real estate markets. This may further have impacts on

home prices and the number of pending home sales. Since the number of pending home sales also includes the transactions agreed to but not closed, it has relative advantage over the number of home sales in reflecting more immediately information in newspapers. A cognitive based model is proposed for understanding of frame effects through a differently framed news article. The study explores how individuals' perceptions on the residential real estate markets are affected by framing, or agenda setting. An investigation is conducted into how a positive or negative portrayal of real estate market information affects the thoughts and recall of an individual. It is hypothesized that when content of local newspaper coverage about the real estate market is pessimistic there is relatively more pessimistic response on market perception than when media coverage is more optimistic. Thus, the third research question (RQ3) of the study is: how does optimistic versus pessimistic framing affect the market perception of an individual?

Importance of Study

This study is designed to uncover the underlying relationship between the content of newspapers and activity in residential real estate markets. There is a consensus that public media, particularly local newspapers, play a role in keeping people informed about activities in the residential real estate market since newspapers transmit information about the residential real estate market every day, including the relative changes of market indicators such as home prices and number of home sales. However, it is unclear if there is an underlying relationship between pessimistic word usage and optimistic word usage in newspaper articles, and the residential real

estate market. Does the content of real estate news influence activities in residential real estate markets? Since this topic has been largely unexplored, the currently available literature does not provide a concrete answer to this question.

This study also important in that behavioral theories have been adopted to interpret the relationship among our research variables: the content of newspapers and activity in the residential real estate markets. Behavioral theories adopted are two-system of cognitive process, affect heuristics and framing effect. These behavioral theories provide an understanding and explanation of the phenomena observed in real estate activity. In this study, two system of cognitive process has incorporated affect heuristics. They explain that language plays a critical role in evoking a situation and drawing an individual's attention toward a certain aspect of a social phenomenon. People's attention and their responses can be explained by the role of two-system cognitive process and affect heuristics. The overall tone of a message can be determined by the number of pessimistic words versus optimistic word usage in the message. Therefore pessimistic and optimistic word usage in newspaper articles are treated as behavioral research variables since the words deliver more perceptual images than logical narrative description.

Also, framing effect can be incorporated when an individual's perception is assumed be affected by different presentation of the same object and social phenomenon. This framing affect can be utilized through different manipulations in news articles. Therefore, the different frames can affect human behavior, especially in their perception of residential real estate markets. This presumption is the foundation of the research described here that seeks to identify the underlying relationship between newspaper content and the residential real estate market.

In the third component of the study, content analysis is used to extend currently available methodologies in behavioral real estate studies. Because there is no readily available

quantitative data about pessimistic and optimistic word usage in the content of newspaper, it is necessary to convert qualitative news content into a quantitative research variable to test for residential market activity. The study introduces content analysis as a new data generation method in the behavioral research field (the traditional methods in the behavioral research field of real estate being the field survey, the process tracing protocol, and the controlled experiment).

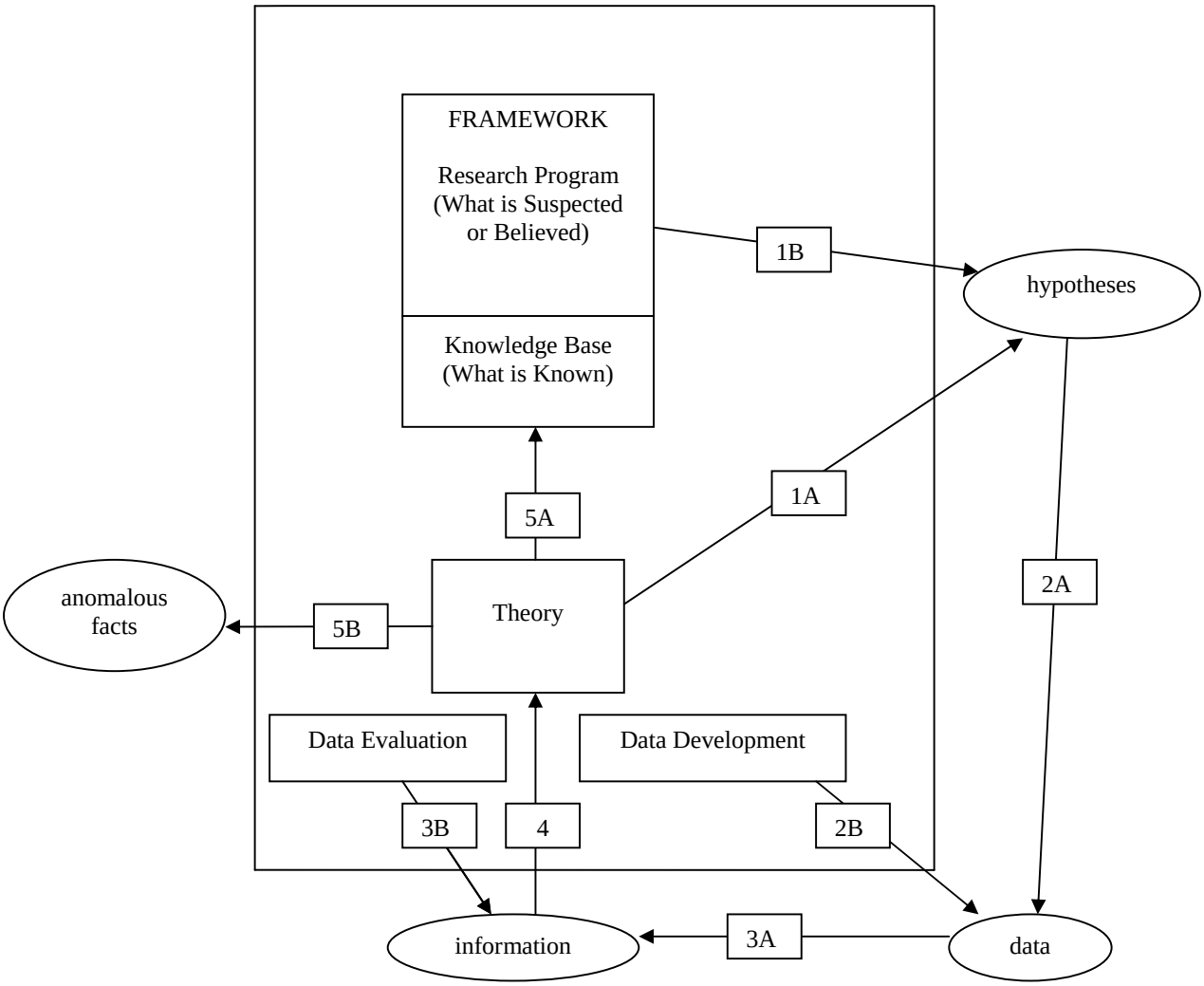
In the final section of the study, a seemingly related research agenda is explored with two different approaches. The main objective of the study is to identify the underlying relationship between newspaper content, activities in the real estate market, and people's perceptions about the residential real estate market. This means each market activity is affected by an individual's perception of the market, which in turn is heavily influenced by media content. However, in order to prove these underlying relationships, the underlying relationship at both the individual and market levels must be illustrated.

In parallel, the study also provides in-depth analysis about the individual level process in the residential real estate market. Thus, the critical question is, how are individuals affected by relatively optimistically and pessimistically framed news articles? Accordingly, focus in Part II of our study (controlled experiment) is upon the analysis at the individual level in examining the role of pessimistic and optimistic words within the framing effect. This provides a more individualized measure about perception of activities in the residential real estate market. Therefore, Part II of the research, which focuses on the use of a controlled experiment, complements the content analysis in Part I and vice versa, mutually reinforcing an understanding of the true underlying relationship among the research factors.

Organization of Research Approach

Diaz's (2002) *Paradigmatic Knowledge Production System* is used to develop the research approach adopted in this study. The critical components this system are its framework, theory, data development methods, and data evaluative methods (as shown in figure 2).

Figure 2 Paradigmatic Knowledge Production System



(Source: Diaz & Hansz 2002)

A paradigm's framework defines the territory of the discipline by identifying both what is known within the discipline and what is unknown within the discipline yet may be suspected

because of suggestive theory. This area of what is unknown, but likely suspected, forms the discipline's research program or agenda, in this case the relationship between public news media, a local newspaper and residential market activities. Researchers who adhere to the paradigm work to convert suspected beliefs into knowledge by identifying supporting evidence in a process. In this process, a theory is applied to situations not yet researched generating formal statements of belief called ‘hypotheses.’, as described in previous sections.

Data generation methods in this study, a content analysis and controlled experiment, are then applied to the hypotheses to generate relevant data. Next, evaluative methods, in the case, time series modeling, Vector Error Correction Model (VECM) and two sample-mean difference tests, are applied to the generated data to create information; and information if supportive of the hypotheses is structured by theory into the framework, expanding the knowledge base and shrinking the unknown territory. Information that is inconsistent with the suggestive theory, and therefore cannot be structured into knowledge, is set aside as anomalous facts.

This dissertation consists of the following five chapters structured in correspondence to the Paradigmatic Knowledge Production System shown in Figure 2. The first chapter includes introductory material, the purpose and importance of the study. In the second chapter, a review of important literature is discussed and this part relates to the Theory (1A) and Framework (1B). This literature discussion includes both theoretical and empirical literature relevant to the hypothesis regarding the relationship between the content of the local public media and activities in the real estate market. A review of behavioral literature forms the theoretical foundation and understanding of the experimental approach of the study. Chapter 3 includes descriptions of how data are generated and the evaluative methods used to test the hypothesis. This section includes Data (2A) and Data Development (2B). Also presented are the research hypotheses (2A) and a

discussion of methodological issues, as between empirical methodology and experimental methodology.

In Chapter 4, there is a discussion of the empirical experimental data analyses (3A) used to test the hypothesis on the relationship between the content of newspaper and activity in the residential real estate market (hereafter part I). In Chapter 4, a description is presented of the experimental data analyses (3A) used to test the hypothesis on how the framing of real estate news impacts an individual's perception of the real estate market (hereafter part II). Chapter 5 presents the conclusions drawn from the study and the implications

CHAPTER TWO

LITERATURE REVIEW

Overview of Literature Review

This chapter reviews the literature forming the foundation for the study. Chapter two is divided into five sections, in addition to this brief overview. Section one introduces the overview and explores the foundation of behavioral research. Section two introduces the overview of behavioral research applied in real estate fields. It explores this as applied in real estate topics including the appraisal valuation process, appraiser objectivity, and other applied real estate areas. Section three presents the two-system view of reasoning as a cognitive process which is the theoretical base for this dissertation. It describes how this theory can be applied to an individual's decision-making about the residential real estate market. Detail description about two-system view of reasoning is shown in this section. The next section presents the concept of affect heuristics as it relates to this study. Also, the idea of a framing effect is also presented with both theoretical and applied illustrations. The literature on public news media is also included.

Introduction of Behavioral Research

The foundation of behavioral research is a series of works by Amos Tversky and Daniel Kahneman (1974,1982, 1984, and 2000). Their works on "heuristics and biases" substantially contribute to academic research on human judgment. The idea that judgment under uncertainty often rests on a limited number of simplifying heuristics rather than extensive algorithmic processing soon spread beyond academic psychology, and influenced theory and research across

a range of disciplines including economics and political science. Their models of heuristics and biases have been applied most vigorously in the discipline of economics, but their considerable influence can be felt in all the behavioral and social sciences.

An important related theoretical development in this field was the theory of human problem solving developed by Simon (1978). This theory suggests that the “full” rationality implied by the rational choice model is an unrealistic standard for human judgment. What is proposed is a more limited criterion for actual performance, famously dubbed bounded rationality, which acknowledges the inherent processing limitations of the human mind. Interestingly, Simon noted that people could cope effectively with inherent limitations with bounded rationality. Although they acknowledge the role of task complexity and limited processing capacity in erroneous judgment, Kahneman and Tversky were convinced that the processes of intuitive judgment were not merely simpler than rational models demanded, but were categorically different in kind. Kahneman and Tversky (1974) described a set of heuristics such as representativeness, availability, and anchoring and adjustment heuristics along with a dozen systematic biases, including non-regressive prediction, neglect of base-rate information, overconfidence, and overestimates of the frequency of events that are easy to recall.

The availability heuristic (Kahneman & Tversky, 1974, 1979) is defined as the ease by which one bring to mind examples of a certain event, and how that ease of retrieval affects judgments on the frequency of that event. Use of the availability heuristic leads to error whenever memory retrieval is a biased cue to actual frequency, because of an individual’s tendency to seek out and remember dramatic cases or because of the broader tendency to call attention to examples of a particular (restricted) type. Some of these biases are defined as

deviations from some “true” or objective value, but most are violations of basic laws of probability.

Representativeness is a judgement heuristic in which the probability of an event is judged by the similarity of the event to the relevant population of events without regard to other factors. The problem with representativenss occurs when base rate information is ignored and redundant information is given greater weight. Kahneman and Tversky(1974) were the first researchers to indentify the anchoring and adjustment heuristic. Anchoring occurs when a person adopts an initial starting point (which may be given, estimated, or implied) as a reference point and then proceeds to use this information as the basis of evaluating a given option. Some of the biases are identified by systematic errors in estimates of known quantities and statistical facts. Other biases are identified by systematic discrepancies between the regularities of intuitive judgments and the principles of probability theory, Bayesian inference, or regression analysis.

The Behavioral Literature about Real Estate

Early behavioral research in real estate examined the valuation processes of professionals. Much of the research still remains in this area although some other activities including lending and negotiation have also been studied. The valuation processes are broken into four categories: departures from normative models (Diaz, 1990a; Diaz, Gallimore, and Levy, 2004); comparable sale selection (Diaz ,1990b; Gallimore and Wolverton, 1999)); valuation biases (Diaz and Wolverton, 1998; and Diaz, 1997)); and agency-related impacts or feedback (Diaz and Hansz, 2001).

As noted above, important behavioral research has been conducted in relation to both lending and negotiation. In relation to lending, Hardin (1997) applied process tracing techniques,

which provide direct access to what information is used and how it is used by a decision maker during decision making or problem solving. This is a useful tool for the development and testing of theories. Hardin applied this data generating process to loan officers and found that a lender's perception of the attractiveness of a potential loan was a function of the lender's training and experience. In relation to property negotiation, the anchoring role that asking price plays was explored in a series of controlled negotiating experiments detailed by Black, Diaz and Wolverton (1997). Real estate professionals and real estate students gave inappropriate weight to asking price in these experiments. This tendency prevailed even when asking price was incongruent with available market data and when a reward system contingent upon negotiating performance was in place.

Mori (2006) raised a research question related to Kahneman and Tversky's (1984) Prospect Theory, which seeks to describe how individuals evaluate potential gains and losses differently. According to the theory, people have different risk attitudes towards gains and losses, and they generally care more about potential losses than potential gains. Prospect Theory suggests that people tend to consider outcomes relative to a certain reference point, also called the *status quo*, rather than to the final status. This phenomenon is linked to the concept of a framing effect. Mori (2006) used prospect theory to investigate whether a 'riskier' mortgage type (ARMs) would be chosen by individuals when framed as a choice that involved loss. He found evidence to support this. This means that risk-averse people tend to become more risk-seeking when choosing a mortgage type, being drawn more to an adjustable rate mortgage (ARMs) when framing the mortgage choice problem as part of a loss situation.

Two-System View of Reasoning: Cognitive Processes Used to Evaluate the Residential Real Estate Market

The theoretical base of this dissertation is Kahneman's two-system view (2003) of cognitive processing, as applied to an individual's decision-making about the residential real estate market. The two- system view is labeled as System 1 and System 2. According to Kahneman (2003), cognitive processing in System 1 generally operates in an effortless, fast, automatic, associative, implicit and often emotionally charged manner. Cognitive processing in System 2 activates an effortful, controlled, slower, serial, more deliberate, and consciously monitored response.

In general, both Simon (1973) and Kahneman & Tversky (1974) treat the overall mental capacity of human beings as limited and thus the effortful processes tend to disrupt each other, whereas relatively natural processes such as perception and intuition neither make nor provide conflicts when processing co-existing complex tasks. Correspondingly, individuals attempt to follow a cognitive process with two-systems of reasoning when faced with complex tasks. Figure 3 illustrates the components of the overall process.

Figure 3 Process and Content in Two Cognitive System

	PERCEPTION	***INTUITION*** ***System 1***	***REASONING*** ***System 2***
PROCESS	Fast Parallel Automatic Effortless Associative Slow-learning Emotional		Slow Serial Controlled Effortful Rule-governed Flexible Neutral
CONTENT	Percepts Current stimulation Stimulus-bound	Conceptual representations Past, Present and Future Can be evoked by language	

Source: Kahneman (2003)

In Figure 3, System 1 generates impressions of the attributes of objects. These impressions are based on perception and intuition; and do not rely on deliberate reasoning or logic. In System 1, intuitive judgments relate to concepts as well as perceptions in terms of process and content, and they can be evoked by language. The fact that perceptions and intuitive judgments can be evoked by language offers a valuable insight for this dissertation. It prompts formulation of research questions on the relationship between activity in the residential real estate market and the content of local newspapers as a language between perception and intuition.

In contrast, judgments are always intentional and explicit even when they are not overtly expressed. Thus, System 2 is involved in all judgments, whether they originate in impressions or in deliberate reasoning. The label ‘intuitive’ is applied to judgments that directly reflect impressions and they are not modified by System 2. In relation to testing the conjectures in this

dissertation, content analysis attempts to measure the proxy of System 1, real estate market perception, and identify its relationship to real estate market outcomes such as sales price and the number of pending home sales. Sales price and the number of pending home sales are normally assumed to be only from System 2 because utility theory suggests that people determine the sales price and make sales decisions based on purely rational assumptions.

There is some available literature about perceptual response. This asserts that system 2 relies more on the operation of system 1, which adopts heuristics and bias approaches, and is more likely associated with errors. This suggests that the validity of system 1 is related to the accuracy of the system 2. Kelly and Jacoby (1996) analyze system 1 and system 2, investigating in two experiments the influence on the subjective experience of later problem-solving. They use the solution words to anagrams in the first phase of the experiments to lead to faster solution of those anagrams in a second phase. Participants interpreted their easy solution of old anagrams as due to characteristics of the anagrams and judged them as easier for others to solve, relative to new anagrams. When participants were deprived of the subjective experience of solving the anagrams by presenting the solution with the anagram, they switched to an alternative basis for judgment such as a theory or rules, which leads to different ordering of items according to judged difficulty.

Reber, Winkielman, and Schwart (1998) found that repeated exposure leads to the subjective feeling of perceptual fluency, which in turn influences preference. In their experiment, they found higher perceptual fluency was achieved by presenting a matching rather than no matching prime. Perceptual fluency was also manipulated by presentation duration. Stimuli shown for a longer duration were liked more, and disliked less. They found that perceptual fluency is affectively positive.

Turning to the relationship between the content of newspapers and the residential real estate markets, these findings suggest that individuals may be exposed to a wide array of environmental manipulations from given news information about the residential real estate markets, and make systematic errors when they adopt heuristics in system 1. The two-cognitive system is therefore adopted as the theoretical base and the foundation of the hypotheses that are investigated in this study.

Affect Heuristics Focusing on Risk Side

The research naturally turns to the following questions: what type of heuristics does an individual adopt when they process complex residential real estate market information in the two-system view? As used here, affect means the specific assessment of whether an object or a phenomenon is good, and thus it should be approached, or bad, and accordingly should be avoided.

According to Slovic, Finucane, Peters and MacGregor (2002), affect heuristics play a critical role in evaluating stimuli as good or bad and are a particularly important natural assessment. Affective responses occur rapidly and automatically. They also discuss the benefit of aspects of experience or association-based processing in the context of risk, which enables mankind to survive during the long period of human evolution and remains the most natural and most common way to respond to threat, even in the modern world. However, there is a potentially dangerous situation in affective processing, since this needs some action to be taken to reduce the diagnosed risk. The affective responses on a certain negative feeling or feeling of uneasiness and fear will serve as a salient reminder to take such action and should remain in place until such action is completed and the impending danger flag can be removed. Slovic *et al*

(2002) adopt this affective response to interpret peoples' reactions to the events of September 11 and consider their aftermaths are important illustration of insights into the psychology of risk perception and response to risk. This perspective can also provide insight when interpreting people's response to the current residential real estate markets.

Slovic *et al* (2002) also provide some empirical evidence of affect heuristics. They find evidence that a stimulus image is reflected in the affective feelings associated with that image. Several empirical studies have demonstrated a strong relationship between imagery, affect, and decision making. Many of these studies used a word-association method. This method involves presenting subjects with a target stimulus, usually a word or very brief phrase and asking them to provide the first thought or image that comes to mind. The affective manipulation often works directly with language. Communicators desiring to change attitudes toward stigmatized technologies, for example, created "nukespeak" to extol the virtues of "clean bombs" and "peacekeeper missiles," while promoters of nuclear power coined a new term for reactor accidents: "excursions." Genetically modified food has been promoted as "enhanced" by proponents and condemned as "frankenfood" by opponents. Manipulation of attitudes and behavior by persuasive argumentation is often quite effective, but can also be recognized as an attempt to persuade.

Findings from experiments with gambles suggest that, without a context to give affective perspective, quantities of dollars may convey little meaning (Slovic *et al*, 2002). The affect heuristic can explain a finding that points at compatibility between stimulus attributes and response scales as an explanation for preference reversals. Extremely high-weight probabilities when rating attractiveness may be explained by the fact that the probabilities are more readily coded as attractive or unattractive than are the payoffs. Such reversals were exhibited when an

individual chose Gamble A (with a high probability of winning a modest amount of money) over Gamble B (with a smaller probability of a larger payoff) but assigned a larger monetary value (buying price or selling price) to Gamble B. Choice A provides more easy accessible attractiveness based on chance to win rather than chance to lose.

Holtgrave and Weber (1993) examined the relative impact of the two experiential/feeling based and the rational/rule-based processing systems on people's perceptions of risk. They found that a hybrid model of risk perception that incorporates both affective variables (dread) and cognitive-consequentialist variables (outcomes and probabilities) provides the best fit for risk perception of situations with uncertain outcomes in both the financial and health-and-safety domain. This suggests that affective reactions play a crucial role even in seemingly "objective" contexts such as financial investment decisions.

Affect Heuristics & Risk Perception

Finucane, Alhakami, Slovic, and Johnson's (2000) study of the affect heuristic was used to explain the unexpected negative correlation between benefit and risk perception. They theorized that a good feeling towards a situation (i.e., positive affect) would lead to a lower risk perception and a higher benefit perception, even when this is logically not warranted for that situation. This implies that a strong emotional response to a word or other stimulus might alter an individual's judgment, with different decisions based on the same set of facts, leading to a different response.

A study by Slovic and Alhakami (1994) suggests that risk and benefit may be inversely related in people's minds because an affective feeling is referred to when the risk or benefit of specific hazards is judged. Specifically, they observed that the relationship between perceived

risk and perceived benefit was linked to an individual's general affective evaluation of a hazard. If an activity is 'liked', people tend to judge its risks as low and its benefits as high. If the activity is 'disliked', the judgments are the opposite — high risk and low benefit.

According to their argument, individuals may make judgments by deliberating on what the net difference is between the risks and benefits of any particular item. As an example, Finucane *et al* (2000) tested affect heuristics using certain phenomena that can be observed in daily life. These included nuclear power plants, natural gas, and food preservatives, phenomena the risks of which are hard to quantify in terms of a standard deviation. They found that information about risk doesn't necessarily bear any relationship to information about benefits. Increased risk appears to make people perceive lower benefits and vice versa. Building from this finding, the current study attempts to examine residential real estate decisions where only two distinct approaches, perceived benefit and perceived risk, exist as a function of affect heuristics.

Framing Effect

Intuitive judgments in System 1 relate to concepts as well as perceptions in terms of process and content. These judgments can be evoked by language. This viewpoint has provided a basis for the framing theory on the residential real estate market. In the current study, the term framing refers to differently framed news articles that suggest particular themes and/or different interpretations of the subject matter.

Framing can be traced back to its roots in both psychology (Kahneman and Tversky 1979, 1981, 1984) and sociology (Pan & Kosicki, 1993). The psychological origins of framing lie in experimental work by Kahneman and Tversky (1979, 1984) They examined how different

presentations of essentially identical decision-making scenarios influence people's choices and their evaluation of the various options presented to them. Tversky and Kahneman (1981) demonstrate the framing effects using the following example from the Asian Disease problem which contradicts the traditional argument from utility theory that preferences are not affected by variations of irrelevant features of options or outcomes.

The Asian Disease

Imagine that the United States is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Respondents were randomly allocated to one of two groups. One group use framed with alternative outcome expressed in terms of lives saved, the other groups choice who expected in terms of deaths. Both groups choice involves a certain outcome and 'risky'(probabilistic alternative) outcomes.

Assume that the exact scientific estimates of the consequences of the programs are as follows:

If Program A is adopted, 200 people will be saved.
If Program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved.

Which one of the two programs would you favor? In this version of the problem, a substantial majority of respondents favor Program A, indicating risk aversion.

Other respondents, selected at random, receive a question in which the same cover story is followed by a different description of the options:

If Program A_ is adopted, 400 people will die.
If Program B_ is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die.

A clear majority of respondents now favor Program B, the risk-seeking option. These immediate affective responses respectively favor Program A over Program B and Program B over Program A. Although there is no substantive difference between the versions, they

evidently evoke different associations and evaluations through language (Kahneman & Tversky, 1981).

The sociological foundations of framing were laid by Goffman (1974) and others who assumed that individuals cannot understand the world fully and constantly struggle to interpret their life experiences and to make sense of the world around them. In order to efficiently process new information, Goffman (1974) argues that individuals apply interpretive schemas or ‘‘primary frameworks’’ to classify information and interpret it meaningfully. Therefore framing is both a macrolevel and a microlevel construct (Scheufele, 2007).

As a *macroconstruct*, the term ‘‘framing’’ can refer to modes of presentation that journalists and other communicators use to present information in a way that resonates with existing underlying schemas among their audience (Reese, 2007). This does not mean, of course, that most journalists try to spin a story or deceive their audiences. In fact, framing, for them, is a necessary tool to reduce the complexity of an issue, given the constraints of their respective media. Frames become valuable tools for presenting relatively complex issues efficiently and in a way that makes them accessible to lay audiences because they play to existing cognitive schemas. As a *microconstruct*, framing describes how people use information and presentation features regarding issues, as those subject to the framing form impressions.

The current study assumes that the framing effect is critical at both the micro level (where individuals use information and presentation features related to issues as they form impressions) and the macro level (where journalists present the same information in their articles). It may be suspected that in a residential real estate market, individuals have difficulty in obtaining information and in understanding the information they receive. Therefore people utilize frames to help them understand relatively complex issues, and journalists present information in a way

that is more accessible to audiences. The latter comments are significant in helping to introduce a more practical description of the macro level framing of newspapers: this is the theory of agenda setting.

According to McComb and Shaw (1972), agenda setting refers to the idea that there is a strong correlation between the emphasis that mass media place on certain issues, based on relative placement or amount of coverage, and the importance attributed to these issues by mass audiences. They study presidential elections and attempt to investigate the relationship between the people's recognition of important issues and the content of mass media. They find that mass media exerts a significant impacts on people's recognition of the major issues in presidential elections. In the residential real estate market, the conjecture in this study is that this also occurs when news content on the real estate market suggests to audiences that they should focus on certain issues and their importance.

The Literature Review on Public News Media

There is relatively little literature about the relationship between local media content and activities in the residential real estate market. However, there is a large and growing body of work on the political significance of news about the economy. Erikcson, Mackuen and Stimson (2002) found that news coverage about the economy has an effect on the public's perceptions of the economy, which in turn has an effect on the public support of government.

Gross and D'Ambrosio (2004) investigated whether different frames on news coverage also lead to different levels of emotional response. They conducted an experiment examining emotional reactions to newspaper coverage of the 1992 Los Angeles riots. The experiment focused on a particular kind of frame: causal attributions offered for racial unrest. They used an

experimental approach with randomly assigned participants to one of three treatment conditions in which they read one of three newspaper articles about the 1992 Los Angeles riot. The basic riot description condition was a news story about what happened in Los Angeles. The other two conditions replicated the details of the basic riot article but went on to make arguments about the underlying cause. The situational attribution condition focused on the social conditions in south-central Los Angeles—poverty, joblessness, and a history of tension between police and minority residents. The dispositional attribution condition emphasized individual responsibility and criminality to explain the cause of the riots. Each contained a variety of details and arguments which might elicit emotional response. Across all three frames, a high proportion of respondents reported feeling anger, sympathy, and disgust, with slightly fewer reporting feelings of pity. Participants in the situational frame were also more likely to report feeling sympathy or pity for the situation of the city or the plight of minorities. Those in the description or dispositional frames, however, reported more sympathy and pity emotions that focused on the individuals involved in the riot, sympathy or pity for the innocent victims, and pity for the rioters. Finally, their findings support the argument that emotions are not irrational impulses but in fact may be central to people's ability to reason. They found that frames can alter emotional reactions. When people evaluate a situation, they experience perceptions according to the information and beliefs accessible to them at that time, as well as their feelings of whether the situation violates their values or affects their pursuit of a goal. This implies that two people with different information or with differing values or goals might experience the same phenomenon and report feeling different emotions.

Tetlock (2007) measured the relationship between the daily content of a popular Wall Street Journal column and activities in the stock market. Tetlock (2007) is the first to find

evidence that news media content can predict movements in broad indicators of stock market activity. Using principal components analysis, a simple measure of media pessimism was constructed from the content of the *WSJ* column. An estimate was made of the intertemporal links between this measure of media pessimism and the stock market. The methodology adopted was basic vector autoregressions (VARs). Telock finds that high levels of media pessimism robustly predict downward pressure on market prices, followed by a reversion to fundamentals. Second, unusually high or low values of media pessimism forecast high market trading volume. Third, low market returns lead to high media pessimism. These findings suggest that measures of media content serve as a proxy for investor sentiment or non informational trading. Tetlock contends that high values of media pessimism induce downward pressure on market prices; unusually high or low values of pessimism lead to temporarily high market trading volume. It is interesting to note that this work is the first to find evidence of the relationship between the content of media and daily stock market activity. Tetlock's research was based on a purely efficient market hypothesis, with stock prices reflecting all publically available information. A market such as that for residential real estate, however, tends to be less efficient, being populated by a different pattern of participants, and involving assets that are traded infrequently, with large transaction and information costs.

In studying the asymmetric response to news, Soroka (2006) confirmed that an individual's response to positive and negative information is asymmetric where the unit increase in negative news is not simply the opposite of a unit decrease in bad news. He used a term 'Media' measured using coverage of unemployment and inflation in The Times (London) from July 1986 to December 2000. Just over 5,000 relevant articles were coded as positive, negative, or neutral in their coverage. Soroka found that public responses to negative economic

information are much greater than are public responses to positive economic information. Mass media respond asymmetrically to economic information, and the public then responds asymmetrically to both media content and the economy itself. Interestingly, Soroka notes that this asymmetric response observed in public news media relates to the theory of loss aversion and Kahneman and Tversky's prospect theory (1997). Thus, he provides evidence that asymmetric responses to positive and negative news are widespread amongst media, the public, and policymakers. This research for this dissertation is also concerned with pessimism in news content and its relationship with market activities. Thus asymmetric responses may be expected where people react more promptly or significantly to pessimism from a local newspaper.

Conclusion of Literature Review

This chapter incorporated mainly three theoretical foundations: a two-system view of cognitive processing, affect heuristics, and the framing effect. The overall approach provides readers with a set of conceptual underlying links between the content of real estate news articles and residential real estate markets.

According to Kahneman's (2003) theory of intuitive judgment, the operation of system 1 (perception and intuition) and system 2 (reasoning) are not independent of each other. It is contended in this study that intuitive judgments deal with concepts as well as with percepts and can be evoked by language, such as the content of newspaper. This is the foundation for both the further content analysis and the controlled experiment.

In contemplating the workings of the affect heuristic it is argued that the concept of a residential real estate market is not only dependent on analytical comprehension; it also incorporates an individual's perceptual understanding of the residential real estate market, which

utilizes affect heuristics. In addition, framing is based on the assumption that the way in which an issue is characterized in a news articles can have an influence on how it is understood by readers. The framing exposes people to highly accessible features though manipulation and it influences decisions, whereas features of low accessibility by manipulation are largely ignored. In this sense, the affect heuristics and framing will help formulate people's overall perceptions of the residential real estate market in one of two ways: a positive and good manner that suggests we may approach something or a negative and bad manner that suggests we must avoid something.

The study of affect heuristics, framing and the decision making process is in the early stages in the field of real estate studies. Thus, it is worthwhile to consider these theories as a foundation of further applied research in the real estate.

CHAPTER THREE

DATA GENERATION AND METHODOLOGY

Data Generation and Data Evaluative Methodology for Part I

In order to test underlying relationship between the content of newspapers and residential real estate market activities, the behavioral methodologies that are adopted differ from those used in the financial paradigm. The traditional data generation methods in the behavioral research field of real estate are the field survey, the process tracing protocol, and the controlled experiment. In this study, content analysis is introduced as a new data generation method in the behavioral research field.

The first and second research hypotheses of this study seek to determine how media pessimism affects housing prices and the number of homes sales. To investigate these, the content of real estate articles from a local newspaper, *The Atlanta Journal-Constitution (AJC)* are analyzed, although the analysis considers the effects of both optimistic and pessimistic contents in real estate news articles. Following Soroka (2006), however, it is expected that pessimistic content plays a critical role in the perceptual and the intuitive systems thereby generating a negative overall perception of the residential real estate market. Furthermore, pessimistic media content affects some portion of the reasoning process which in turn has an effect on market activities. This reasoning process does not rely on the deliberate and logically explicit; judgments can also be influenced by language. This leads to use of content analysis as a method to generate data and provides a foundation to test the causal relationship between media pessimism and activities in a residential real estate market.

Content analysis enables simultaneous application of both quantitative and qualitative techniques. The method is widely adopted in studies in various academic areas including marketing, mass communication studies, and finance (Wood, Owens and Durham, 2000; Semetko and Valkenburg, 2000; Tetlock, 2007). The number of words in real estate articles from a local newspaper can be counted while the content of real estate articles can be classified qualitatively according to perception and attitudes (revealing precise figures of qualitative language which affect the perception and intuition stage (Kahneman, 2003).

In the study, an analysis in conducted of real estate articles in the *AJC* from January 2002 to October 2008 with the main keywords real estate, real estate price and home price. The *AJC* articles are obtained from the Dow Jones Factiva Online Database service. In order to evaluate the accuracy of recollect for the articles, use is made of the method for validating database search term suggested by Stryker, Wray, Hornik, and Yanovitsky (2006). A quantifiable assessment is obtained by examining the precision of the search terms. The accuracy is regarded as an estimate of the conditional probability that a particular text is relevant, given that is retrieved. The minimum accuracy rate applied in the study is approximately at 90% above the recommendation. Over 600 relevant articles captured from the online source are coded to provide complete details for the content analysis.

Residential real estate is regarded as a local industry and thus the *AJC* has a good fit because it covers information on Atlanta's regional residential real estate market. Thus, it is contended that the *AJC* meets the construct validity requirement of the research hypothesis because it is a representative information source on the local real estate market. The *AJC* is considered to be a relevant source of information about the residential real estate market for the following reasons. First, it is the most reputable publication in Atlanta's Consolidated

Metropolitan Statistical Areas (CMSA) with the largest number of 1.9 million readers. Second, most influential regional forecasters make use of this newspaper to deliver its findings. The paper has the second highest readership among newspapers in the nation's top markets. The *AJC* is also the largest daily newspaper in the Southeast. Over five weekdays, Monday through Friday, 57 % or 1,675,530 of the adults in the 20-county Atlanta MSA read the *AJC*. Over a month, over four Sundays, 72% or 2,131,416 of the adults in the 20 county Atlanta MSA read the *AJC*.

Data Generation for Part I

Classification of 77 Pre-Determined Characteristics of Words

In this study, the content of real estate related articles are classified by reference to positive and negative words. The classifying methodology used is from the Harvard Psychological Dictionary, which has 77 predetermined categories, to classify content. An article's pessimism or optimism is measured according to the relative frequency of negative words and positive words in each real estate article - the methodology adopted by (Tetlock 2007). The content analysis tool known as General Inquirer (GI) is used to sort each monthly collected article into the 77 categories. This method allows conversion of the content of an article into a numeric measure. All of the numeric measuresand frequency are summarized, and it is possible to derive the number of optimistic word usage as a percentage of the total number of words and the number of pessimistic word usage as a percentage of the total number of words.[2] This

[2] We combine all qualifying real estate article in each month into a single article. We use the following equation to derive the percentage of each pessimistic word and optimistic word usage. Here we only represent the equation of pessimistic words. The equation is as follows:

$$Pessimism = \left(\frac{\#\ of\ \ pessimism\ \ words}{\#\ of\ \ total\ \ words}\right)$$

analysis is based on the frequency of usage classified by the IV-4 Harvard Psychosocial dictionary. The Harvard Psychological Dictionary, published in 1963, is the third major revision of a dictionary including numerous categories of words. Before counting pessimism (a number of pessimistic words) and optimism (a number of positive words), all relevant monthly articles are combined to measure pessimism and optimism in a given month.

Examples of each classification include positive, negative, weak, fall and fail categories[3]. The current version of classifications is available through the General Inquirer website (see http://www.wjh.harvard.edu/~inquirer/). After carefully investigating the pessimistic categories, the author concurred with the classification of the Harvard Psychosocial dictionary of Weak, Fall, Fail and Negative Word as pessimistic words. These words play a critical role in formulating an individual's perception of a residential real estate market.

Secondary Data

Home Prices

The S&P/Case-Shiller Home Price Index, covering a period from Jan. 2003 to Oct. 2008 is used in the analysis. The S&P/Case-Shiller Home Price index is the reference index of transactions used by the Chicago Mercantile Exchange in pricing housing futures and options. One version

[3] The pessimistic category includes 'Weak-Word', 'Negative-Word', 'Fall-Word' and 'Fail-Word'. The some examples of negative-words are ' Crisis', 'Damage', Burden', 'Worry', 'Dread', 'Slash', 'Disaster', 'Trouble', ' Slump', 'Deficit' ' Worst', 'Fear', ' Recession', ' Hurt', 'Drag', 'Chaos', 'Dispute', ' Dangerous', 'Darkness', and 'Struggle'. The typical example of weak-words include ' Drop', 'Fall', 'Lost', 'Sunk', 'Collapse', 'Shrink', 'Decline', 'Loss', 'Concern', and 'Death'. The examples of 'fall & fail' words include 'Bankruptcy', 'Slip', 'Fraud', ' Ruin', 'Abandon', 'Default', 'Tumble', 'Dive', 'Dump', and ' Failure'. The classifications of positive words contain such words as "Positive-Word". The examples are as follows: 'Gain', 'Golden', 'Profit', 'Steady', 'Opportunity', 'Improve', 'Boost', 'Great', 'Shelter', 'Guarantee', 'Bonus', 'Ideal', 'Favorite', 'Best', 'Approve', 'Good', 'Festival', 'Smart', 'Compensate', 'Tumble', 'Worthy', 'Qualify', 'Support', 'Stable', 'Better', 'Effective', 'Advantage', 'Gift', 'Embrace', 'Popular', 'Help', 'Open', 'Confident', 'Asset', 'Bright', 'Appreciation', 'Easy', 'Justify', 'Fair', and 'Reward'. The detail about the classification of the Harvard Psychological Dictionary is shown in Table 2A in appendix.

of the index measures the residential housing market in 10 metropolitan regions across the United States. The S&P/Case-Shiller index for the Atlanta metropolitan region has been adopted for this study as a proxy of for home prices

Pending Home Sales

The monthly number of pending home sales data is obtained from First Multiple Listing Service, Inc (FMLS) service[4]. FMLS is the premier data services provider for real estate professionals in Georgia. The counties selected are based on the S&P /Case-Shiller specification on county inclusion.

Data Evaluative Method for Part – I

In order to test the research questions , the cointegration test suggested Johansen and Juselius (1990) is applied to investigate the relationship between the content of a local newspaper and activities observed in a residential real estate market. If there is evidence of cointegration, then activity in the residential real estate market has a long-run equilibruim relationship with the content of a local newspaper. This cointegration between home prices and number of home sales sales and content of the newspaper is a critical for further research among the variables. The cointegration analysis requires a unit root test to determine if the variables are stationary in the level. If the unit root test indicates that the first differenced series of each variable is non-

[4] FMLS was founded by in Atlanta in 1957. Today, membership covers Georgia and the Southeast. Currently, FMLS has over 2,260 offices and serves more than 36,000 real estate agents. The FMLS listing database contains more than 68,000 active listings located all over Georgia and the Southeast. A network of computers, servers and third party support vendors enable member offices and agents to have immediate electronic access to all listing information maintained in the FMLS web-based system, 1st Connection.

stationary, the cointegration test can confirm that the research variables, content of newspaper and residential real estate market activities, can be cointegrated

The Test of the Unit Root

The unit root test by Dickey and Fuller (1981) is applied to test a stationary condition. To test the unit root hypothesis, the following specifications, namely of the Augmented Dickey-Fuller (ADF) Test, are applied to confirm the stationary condition of research variables.

The basic of unit roots are as follows. Consider a simple AR (1) process:

$$y_t = \rho y_{t-1} + x_t^{'}\delta + \varepsilon_t \qquad (1)$$

where x_t are optional exogenous regressors which may consist of a constant, or a constant and trend, ρ and δ are parameters to be estimated, and the ε_t is assumed to be white noise. If $|\rho| \geq 1$, y is a non-stationary series and the variance of y increases with time and approaches infinity. If $|\rho| \leq 1$, y is a stationary series. Thus, the hypothesis of stationarity can be evaluated by testing whether the absolute value of ρ is strictly less than one.

The Augmented Dickey-Fuller (ADF) Test

The standard ADF test is carried out by estimating Equation (1) after subtracting from y_{t-1} both sides of the equation:

$$\Delta y_t = \alpha y_{t-1} + x_t^{'}\delta + \varepsilon_t \quad (2)$$

Where $\alpha = \rho - 1$. The null and alternative hypotheses may be written as,

$$H_0 : \alpha = 0$$
$$H_1 : \alpha < 0$$

and evaluated using the conventional t-ratio for α :

$$t_a = \hat{\alpha}/(se(\hat{\alpha})) \quad (3)$$

where $\hat{\alpha}$ is the estimate of $\hat{\alpha}$, and $se(\hat{\alpha})$ is the coefficient standard error.

Dickey and Fuller (1979) show that under the null hypothesis of a unit root, this statistic does not follow the conventional Student's t-distribution. They derive asymptotic results and simulate critical values for various test and sample sizes. More recently, MacKinnon (1991, 1996) implemented a much larger set of simulations than those tabulated by Dickey and Fuller. In addition, MacKinnon estimated response surfaces for the simulation results, permitting the calculation of Dickey-Fuller critical values and values for arbitrary sample sizes.

Cointegration Test

The finding that many macro time series may contain a unit root has spurred the development of the theory of non-stationary time series analysis. Engle and Granger (1987)

pointed out that a linear combination of two or more non-stationary series may be stationary. If such a stationary linear combination exists, the non-stationary time series are said to be cointegrated. The stationary linear combination is called the cointegrating equation and may be interpreted as a long-run equilibrium relationship among the variables.

The purpose of the cointegration test is to determine whether a group of non-stationary series is cointegrated or not. As explained below, the presence of a cointegrating relationship forms the basis of the Vector Error Correction specification. We implement VAR-based cointegration tests using the methodology developed by Johansen (1991, 1995a).

Consider a VAR of order p :

$$y_t = A_1 y_{t-1} + ... + A_p y_{t-p} + Bx_t + \varepsilon_t \quad (4)$$

Where y_t is a k-vector of non-stationary I (1) variables, x_t is a d-vector of deterministic variables, and ε_t is a vector of innovations. We may rewrite this VAR as,

$$\Delta y_t = \Pi y_{t-1} + \sum_{t=1}^{p-1} \Gamma_i \Delta y_{t-i} + Bx_t + \varepsilon_t \qquad (5)$$

where:

$$\Pi = \sum_{i=1}^{p} A_i - I, \qquad \Gamma_{\mathrm{i}} = -\sum_{j=i+1}^{p} A_j \qquad (6)$$

Granger's representation theorem asserts that if the coefficient matrix Π_j has reduced rank $r < k$, then there exist $k \times r$ matrices α and β each with rank r such that $\Pi = \alpha\beta'$ and $\beta' y_t$ is I(0). r is the number of cointegrating relations (the cointegrating rank) and each column of β is the cointegrating vector. As explained below, the elements of α are known as the adjustment parameters in the VEC model. Johansen's method is to estimate the Π matrix from an unrestricted VAR and to test whether we can reject the restrictions implied by the reduced rank of Π.

Vector Error Correction Model

The Vector Error Correction Model (VECM) is utilized since it is strongly suspected that the generated time series data has a non-stationary condition. The VECM is a restricted vector error correction model designed for use with non-stationary series that are known to be cointegrated. The VECM has cointegration relationships built into the specification so that it restricts the long-run behavior of the endogenous variable to converge to their cointegrating relationships, while allowing for short-run adjustment dynamics. The cointegration term is known as the error correction term since the deviation from long-run equilibrium is corrected gradually through a series of partial short-run adjustments.

In the first-stage, theory and econometric evidence are used to determine if the various data series contain unit roots and are cointegrated. If the data series are cointegrated, a long-run equilibrium relation (i.e. a cointegrating regression) can be specified in levels as:

$$y_t = \beta_0 + \sum_{i=1}^{n} \beta X_{it} + \upsilon_t \qquad (7)$$

Where y_t is the dependent research variable and X_{it} are theoretical based research variables *i* at time *t.* From this regression, residuals can be estimated as the difference between the actual and estimated equilibrium between testing factors, residential real estate market activity as dependent variables, and causal factors including media pessimism supported by theory. If the residuals from equation (7) are stationary, they may be used as an error correction term in the short run media pessimism effect model as follows:

$$\Delta y_t = \alpha_0 + \sum_{i=1}^{n} \alpha_i \Delta X_{it} - \gamma \hat{\upsilon}_{t-1} + \varepsilon_t \qquad (8)$$

Where $\Delta y_t = y_t - y_{t-1}$ is the first difference of the dependent variables for the study, residential real estate market activity, ΔX_{it} are the first differences of the explanatory variables, and $\hat{\upsilon}_{t-1}$ is the error correction term (the lagged residuals from the long-run regression). Estimation of equation (8) provides evidence of a short-run residential market dynamic and adjustments to the previous disequilibrium in the long-run relation, γ (the speed of adjustment parameter). If $\gamma = 1$, there is full adjustment, while $\gamma = 0$ suggests no adjustment. A more general specification of the short-run model may also include multiple lags of the explanatory and dependent variables.

Data Generation for Part II (*Controlled Experiment Analysis)*

A description has been previously provided of the experimental data adopted to test the underlying relationship between the content of newspapers and the activity in the residential real estate markets. The third research question (RQ3) goes one step further by exploring how optimistic versus pessimistic framing affects an individual's perception of the residential real estate market.

In order to determine the different perceptual responses caused by the framing effect, a controlled experiment is used as a data generation method because this is useful tool for detecting causal relationships; in this study it will be used to identify a casual relationship between news articles as artificially manipulated news article and perceptions of a residential market. The strength of this method is internal validity. A controlled experiment method allows the researcher to isolate the impact of causal research variables and to control for the impact of exogenous influences.

Explanation of Controlled Experiment

Data Generation Procedure & Research Design for Part – II

In designating the controlled experiment to generate relevant data careful organization of the following three major components is necessary: a research instrument, subjects, and manipulation for the treatment group. The following description highlights these three critical components.

Research Instrument

The research instrument used in the study consists of two hypothetical real estate articles. The news articles contain written descriptions of the Atlanta residential real estate market. Half the subjects are given the optimistically framed article as a 'control' version, and the other half of subjects are given the pessimistically framed article as a 'treatment' version. Descriptions of the control and treatment groups and the experimental design are presented in Table 1.

Table 1 Research Design for Framing Effect in Real Estate News Article

	Controlled Experiment Test
Group A	Optimistic Framed Article
Group B	Pessimistic Framed Article

The two framed articles contain objective content about what was happening in the residential real estate market in Atlanta in November 2008. Both articles include numeric figures from S&P/Case-Shiller home price index for Atlanta to reflect the changes of home prices. To enhance the external validity of the study, the written style of real estate articles is followed and the participants told in the controlled experiment that the information had been taken from a major local newspaper. The articles are designed to appear as if they were a snapshot of a whole section of newspaper taken from the *The Atlanta Journal-Constitution*.

Manipulation

The instrument used in the controlled experiment (the optimistically and pessimistically framed articles) is included in Appendix 3. Both the pessimistic and optimistic articles contain common descriptions of the Atlanta market. The following description is a part of both articles:

In the 20 largest metropolitan areas, home prices in November were down an average of 18.2 percent from November 2007, according to Standard & Poor's Case-Shiller Home Price Index.

It has not suffered quite as much with its decline of 11.2 percent over the one-year period of the survey, according to Case-Shiller. From October 2008 to November 2008, Atlanta prices slipped 2.7 percent.

By November 2008, Atlanta prices had dropped 14.6 percent from that peak.

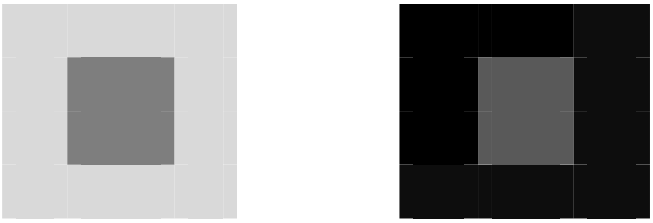
A recent poll taken by the Department of Real Estate at Georgia State University, of real estate industry leaders found that….

Remarkably, a majority of respondents anticipated a two-year stabilizing period for the Atlanta area.

A reference dependent is used, which means target cities such as San Francisco and Las Vegas where the current residential market has been worse than the Atlanta residential real estate market. This is a key to differentiate the two frames and measure the difference of perception for the subjects in the study. This explanation may further be illustrated using the underlying idea in Figure 4.

In Figure 4, there are two enclosed squares which have the same luminance, but they do not appear equally bright. In general, the critical point of this demonstration is that the brightness of an area is an interactive function of the color from the center that reaches the eye from that area. An account of perceived brightness also requires a parameter for a reference value, which is influenced by the luminance of neighboring areas.

Figure 4 Simultaneous Contrasts and Reference Dependence



Contrast same color in term of different background

Source: Kahneman (2003)

In realtion to this study, this implies that written descriptions of the same object can be contrasted or compared with a different situational background. Although the real estate market is a local market, other stimuli are also brought into the optimistically framed article by comparison with highly speculative cities, such as Phoenix, Las Vegas, and San Francisco, to reduce the overall risky perception of Atlanta's residential real estate market.

In the articles, mention is made of a poll about the overall grade of Atlanta's economy and real estate market[5] However, each article adopts a different frame to interpret the outcome of the poll. In the optimistically framed article, the overall economic and real estate condition of Atlanta is considered good or fair as a frame. The article includes a description saying "more than 75 percent of the respondents consider the condition of the Atlanta economy and real estate market to be at a fair or good level. Only 18 percent of the respondents answered poor, and only 5 percent answered falling."

In contrast, the pessimistically framed article changes the angle to include a description that interpret these statistics as "the current condition of the Atlanta economy and real estate

[5] Honorary board members forecast the grade of the current overall Atlanta economy and real estate market condition is at the level of Excellent (0%) Good(10.53%) Fair(65.79%) Poor(18.42%) Falling(5.26%).

market is falling according to 5 percent of the respondents; poor according to 18 percent of the respondents; or fair according to 66 percent of the respondents."

In addition, reference is also made to a professional opinion that two years are required for the market to stabilize. However, each article adopts a different frame on this period, describing it alternately as a recessional period on the pessimistic framed news article and a stabilizing period on the optimistic framed news article. The summary of these manipulations is shown in Table 2.

Table 2 Manipulations for Framing the Real Estate News Article

	Interpretation of Polls	Reference Dependence	Professional's forecasting
Group A (Optimistic Frame)	(A) Good & Fair	(B) Atlanta Historical Market Condition + Reference Dependence with other markets	C) Optimistic Forecasting
Group B (Pessimistic Frame)	(D)Fair & Poor	(E)Atlanta Historical Market Condition only	(F) Pessimistic Forecast

At the end of both articles, subjects are asked to indicate, on a seven-point Likert scale, how optimistic or pessimistic their overall market perception was, based on the information provided. The details on each questionnaire are described in the section IV analysis part.

Subjects

The subjects participating in the study were Georgia State University graduate students taking non-business courses. Because of their age and actual or prospective earning capacity, they are considered valid proxies for actual or potential medium term home buyers. Graduate students taking real estate or business courses were deliberately excluded from the study to avoid

interfering influence stemming from other media and/or academic course, to which such students are more likely to be exposed.

CHAPTER FOUR

RESULTS

Empirical Results from Part I : Underlying Relationship between Newspaper Content and Activity in Residential Real Estate Markets

Content Analysis

Table 3 highlights the descriptive statistics of the frequency of real estate articles from the *AJC* between January 2003 and December 2008. In Table 3, the observations are shown quarterly for concise presentation. Only real estate articles with 2000 words or more are included in our sample since articles of such length should provide a more in-depth analysis of real estate information and therefore be more influential to readers. The highest frequency in total number of real estate articles is observed in year 2006.

Results for both pessimistic and optimistic word usage are shown in Figure 4. The overall use of pessimistic words increased significantly from 2006 to 2008 while the optimistic word usage remained generally flat, declining slightly. The highest peak in pessimistic words occurs at the end of 2008. Optimistic word usage and pessimistic word usage diverge significantly starting in September 2006.

For purpose of comparison with pessimistic and optimistic word usage, the normalized Atlanta home price index and normalized national price index are also shown in Figure 4. Although Atlanta home prices stabilize in June 2006, they peak in September 2007. The divergent pattern between pessimistic word usage and optimistic word usage begins in 2006 when the national home price level begins to decline. Thus, the divergence in pessimistic word

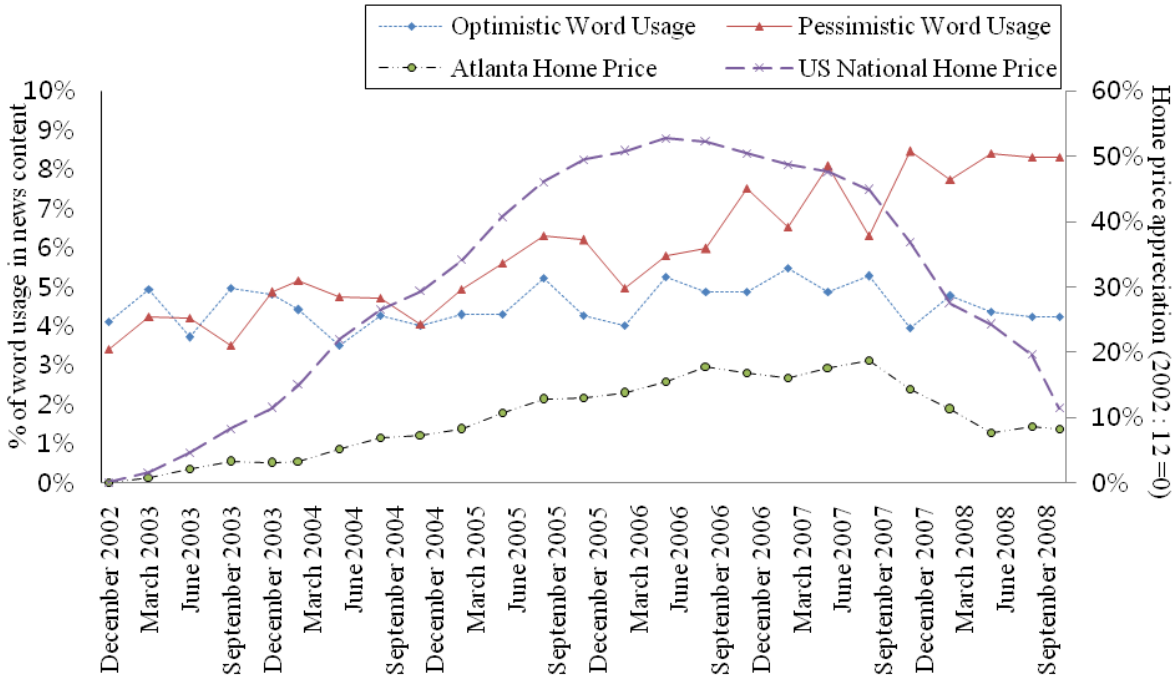
usage and optimistic word usage may be related to decreasing national home prices. Beginning mid-year 2007, when home prices start falling in Atlanta, the divergence between optimistic word usage and pessimistic word usage clearly accelerates in what is likely a reflection of local conditions in the residential real estate market.

Table 3 Descriptive Statistics of Frequency of Real Estate Articles in *AJC*

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total Number of Real Estate Article	Total Number of Articles with 2000 words or more
2003	252	325	331	301	1209	140
2004	339	316	301	276	1232	159
2005	300	276	353	364	1293	162
2006	353	337	300	337	1327	146
2007	274	279	274	286	1113	110
2008	316	286	343	340	1285	144
Average	306	303	317	317	1243	144

Note: Only articles with a word count of 2000 or more are included in the sample.

Figure 4 Percentage of pessimistic and optimistic word usage in newspaper



Note : A quarterly average of the percentage of psssimistic and optimitic words used in The Atlanta Journal Constitution from January 2003 - October 2008. The S&P/Case-Shiller 20- City Composite and S&P Case Shiller Atlanta Home Price Index are used as a proxy for home price ofU.S. national and Altanta level, respectively. The reference point to normalize the begining point is Deceber 2002. Thus, the home price graph shows relative index change from the reference point, December 2002.

Stationarity Test

The data generated from the content analysis is qualitative in nature. However, after the data is converted to a quantitative format, it becomes a time dependent data series or more specifically a quantitative time series. Data analysis begins with a unit root test. Unit root testing is the first stage in identifying an underlying relationship in time series data. It is used to check whether the research variables meet the stationary condition. The unit root results are reported in Table 4.

Table 4 Unit Roots Test for Newspaper Content and Activity in a Residential Real Estate Market

Research Variable	Level		First Difference	
	t-statistic	*p*-value	t-statistic	*p*-value
Home Price ($R_{t,HP}$)	2.396	1.000	-6.432	0.001
Home Sales ($R_{t,Home_Sales}$)	-0.133	0.940	-6.565	0.000
Pessimistic words ($R_{t,Pessm_word}$)	-0.987	0.752	-6.609	0.000
Optimistic word ($R_{t,Optism_word}$)	-2.096	0.246	-7.317	0.000

Note: This study adopts the Augmented Dickey-Fuller test statistic (ADF). The specification of $R_{t,HP}$ is the change of home price, $R_{t,Home_Sales}$ is the change in the number of home sales, $R_{t,Pessm_news}$ is the percentage of pessimistic words, and $R_{t,Optism_word}$ is the percentage of optimistic word.

The test data shows evidence of non-stationary conditions in the level series. However, the test data discloses strong evidence of stationary conditions in the first difference series. All four research variables are significant at the 1% level in the Augmented Dickey-Fuller test, with no exceptions. The results also indicate that all of our research variables are non-stationary in level and pass at the first difference level. This implies that the research variables have a cointegrated relationship suggesting that the underlying relationship among the variables is bound by some non-spurious relationship in the long run.

Cointegration Test

A cointegrating relationship between newspaper content and activity in residential real estate markets can be seen as a long-term or equilibrium relationship. It is possible that cointegrating variables may deviate from their relationship in the short run, but their association would return in the long run. We adopt Johansen's procedure to test for cointegration with our

research variables. Since there are four variables in the cointegration test, there can be at most three linearly independent cointegrating vectors, i.e., $r \leq 3$.

Table 5 Johansen's Cointegration Test for Activities in a Residential Real Estate Market and Newspaper Content

Number of Cointegrating Vectors (r) at Null Hypothesis	Eigenvalue	Trace Statistics	Critical Value at 5%	p-value
$r = 0$	0.534	111.358	47.856	0.000
$r \leq 1$	0.437	62.445	29.797	0.000
$r \leq 2$	0.302	25.632	15.494	0.000
$r \leq 3$	0.040	2.619	3.841	0.106

Note: Trace test indicates 3 cointegrating eigenvalues. The parameter estimates are from the Johansen's test using monthly data over the time period of December 2002 to October. 2008. The variables include home prices, number of home sales, pessimistic words, and optimistic word usage.

The results are presented in Table 5. The first column is the number of cointegrating vectors under the null hypothesis, the second column is the ordered eigenvalues, the third column is the trace statistics, and the last two columns are the 5% critical values and p-values. Trace statistics are used to test for the number of cointegrating relationships. The maximum eigenvalue statistic is used to test the null hypothesis of r cointegrating relationships against the alternative of $r+1$ cointegrating relationships. The trace statistic for the null hypothesis $r \leq 3$ (2.619) is smaller than the critical value (3.841), so the null hypothesis that $r \leq 3$ cannot be rejected suggesting there are three linearly independent cointegrating vectors representing the empirical long-run equilibrium relationship among our research variables.

Controlling for Inverse Causality

In evaluating the effects of pessimistic and optimistic word usage in news content on the residential real estate market, it is important to consider the possibility that the change in news content may be nothing more than a reaction to prior residential market indicators. Thus, it is necessary to test the relative responsiveness of changes in pessimistic and optimistic word usage to the changes in other variables by adopting the Granger causality test for inverse causality. The Granger (1969) approach to the question of whether certain variable x causes y is to see how much of the current y can be explained by past values of y and then to see whether adding lagged values of x can improve the explanation. y is said to be Granger-caused by x if x helps in the prediction of y, or equivalently if the coefficients on the lagged x ’s are statistically significant. The Granger Causality test can be equated as

$$\Delta y_t = \alpha_0 + \alpha_1 \Delta y_{t-1} + ... + \alpha_l \Delta y_{t-l} + \beta_1 \Delta x_{t-1} + ... + \beta_l \Delta x_{t-l} + \varepsilon_t \quad (7)$$

$$\Delta x_t = \alpha_0 + \alpha_1 \Delta x_{t-1} + ... + \alpha_l \Delta x_{t-l} + \beta_1 \Delta y_{t-1} + ... + \beta_l \Delta y_{t-l} + u_t \quad (8)$$

for all possible pairs of (x, y) series in the group. The reported p-value results from the Wald statistics for the joint hypothesis:

$$\beta_1 = \beta_2 = ... = \beta_l = 0 \quad (9)$$

The null hypothesis is that x does not Granger-cause y in the first regression and that y does not Granger-cause x in the second regression.

Table 6 Granger Causality Tests for the Change in Newspaper Content and Activity in the Residential Real Estate Market

Independent Variable	Dependent Variable	*P*-value
Panel 1		
$R_{t,Home_Sales}$ *	$R_{t,HP}$	0.04
$R_{t,Optism_word}$ *	$R_{t,HP}$	0.02
$R_{t,Pessm_word}$ **	$R_{t,HP}$	0.00
Panel 2		
$R_{t,HP}$	$R_{t,Home_Sales}$	0.23
$R_{t,Optism_word}$	$R_{t,Home_Sales}$	0.41
$R_{t,Pessm_word}$ *	$R_{t,Home_Sales}$	0.05
Panel 3		
$R_{t,HP}$	$R_{t,Pessm_word}$	0.23
$R_{t,Home_Sales}$ *	$R_{t,Pessm_word}$	0.05
$R_{t,Optism_word}$	$R_{t,Pessm_word}$	0.27
Panel 4		
$R_{t,HP}$	$R_{t,Optism_word}$	0.40
$R_{t,Home_Sales}$	$R_{t,Optism_word}$	0.58
$R_{t,Pessm_word}$	$R_{t,Optism_word}$	0.69

Note: $R_{t,HP}$ is the change in home price, $R_{t,HomeSales}$ is the change in number of home sales, $R_{t,Pessm_word}$ is the percentage of pessimistic word usage, and $R_{t,Optism_word}$ is the percentage of optimistic word usage. The parameter estimates are from the time period Jan 2003 Oct 2008. ** and * denote p-value at 1% and 5%, respectively.

In Table 6, the panel 1 shows that the change in home prices responds significantly to the change in the number of home sales, pessimistic words and optimistic word usage. Thus, the number of home sales, pessimistic words, and optimistic word usage, do Granger cause the change in home prices.

However, the panel 2 shows that number of home sales does not respond significantly to the change in home prices or optimistic word usage, but it responds significantly to pessimistic words. In panel 3, pessimistic words do not respond significantly to the change in home prices or optimistic word usage, but do respond significantly to the number of home sales. No statistically significant results are found in panel 4. In sum, the results provided in Table 6 support the underlying directional relationship among variables shown in panel 1.

Long-Run Equilibrium Relationships and Short-Run Dynamic Relationships

The following model has been adopted to confirm the long-term relationship among research factors. If the data series are cointegrated, a long-run equilibrium relationship (i.e. cointegrating equation) can be specified in levels as:

$$R_{t,HP} = \beta_0 + \beta_1 R_{t,Home_Sales} + \beta_2 R_{t,Pessm_word} + \beta_3 R_{t,Optism_word} + \upsilon_t \qquad (10)$$

Where $R_{t,HP}$ is the change in monthly home prices, $R_{t,Home_Sales}$ is the change in monthly number of home sales, $R_{t,Pessm_word}$ is the number of pessimistic words as a percentage of the total number of words monthly used, and $R_{t,Optism_word}$ is the number of optimistic word as a percentage of the total number of words monthly used. Also β_0 is a constant and υ is the error correction term. Thus, equation (10) represents the equilibrium long-run relationship where the change in home prices is a function of the change in home sales, pessimistic word usage in news content and optimistic word usage in news content.

One definition of long-run equilibrium is that the relationship between residential real estate market activity and news content are no longer changing. Thus all the differences specified in equation (11) will be zero and everything in the equation cancels in a hypothetical equilibrium. The Error Correction Model can overcome this interpretation problem by using a combination of first differenced and lagged levels of cointegrated variables. The Error Correction Model is interpreted as follows.

$$\Delta R_{t,HP} = \alpha_0 + \alpha_1 \Delta R_{t,Home_Sales} + \alpha_2 \Delta R_{t,Pessm_word} + \alpha_3 \Delta R_{t,Optism_word} + \gamma \hat{\upsilon}_t \qquad (11)$$

Δ denotes the first difference of each research factor. γ is the speed adjustment parameter. If γ=1, there is full adjustment, while γ=0 suggests no adjustment. Each variable will include lag 2. $\Delta R_{t,HP}$ is purported to change between t-1 and t as a result of changes in the values of the research variables, $\Delta R_{t,Home_Sales}$ $\Delta R_{t,Pessm_word}$ $\Delta R_{t,Optism_word}$ and also in part to correct for any disequilibrium υ that existed during the previous period. Broadly γ in equation (11) describes the speed adjustment back to the equilibrium and its strict definition is that it measures the proportion of the last periods' equilibrium error that is corrected for.

Table 7: Long-run Equilibrium Model for the Relationship Between Newspaper Content and Activity in a Residential Real Estate Market

Long-run Equilibrium Relationship Dependent Variable $R_{t,HP}$	β_0	$R_{t,Home_Sales}$	$R_{t,Pessm_word}$	$R_{t,Optism_word}$	Adj. R^2
Dec. 2002 - Oct. 2008	0.0135	0.019*	-0.382**	0.226*	0.568
		(2.06)	(6.32)	(2.39)	

Note: $R_{t,HP}$ is the change in home prices, $R_{t,Home_Sales}$ is the change in the number of homes sold, $R_{t,Pessm_words}$ is a percentage of pessimistic words, and $R_{t,Optism_words}$ is a percentage of optimistic word usage. β_0 is a constant and υ is the error correction term. The parameter estimates are from the Johansen's procedure using monthly data over the time periods of January 2003 to October 2008. T-statistics are in parentheses. ** and * denote p-value at 1% and 5%, respectively.

Table 7 contains parameter estimates and t statistics for our long-run model (Eq. 9) for the time period December. 2002 to Oct. 2008. The corresponding estimated coefficient on the optimistic word usage and the change in the number of home sales is positive and highly significant for the change in home prices while the estimated coefficient on the pessimistic news content is negative and also highly significant. The estimated coefficient on the pessimistic words is - 0.382 for the change in home prices. The corresponding coefficient estimates on the number of home sales and optimistic news are 0.0194 and 0.219, respectively. The adjusted R^2 for a long-run equilibrium model is 0.568.

Table 8: Error Correction Model for the Relationship between Newspaper Content and Activity in the Residential Real Estate Market

Short-Run Error Correction Toward Long-Run Equilibrium Model						
$\Delta R_{t,HP}$	=	α_0	+	$\alpha_2 \Delta R_{t-2,HP}$	+	$\gamma_{speed_Adj} \hat{\upsilon}_t$
		0.000		0.394*		0.331**
		(0.28)		(2.95)		(4.04)

Note: The full specification of the short-run error correction model includes two lags of each of the variables: α_0 , $\Delta R_{t,Home_Sales}$, $\Delta R_{t,Pessm_word}$, $\Delta R_{t,Optism_word}$, $R_{t,HP}$, and $\gamma_{Speed\ Adj.}$ where $\Delta R_{t,Home_Sales}$ is the first difference in the change of home sales, $\Delta R_{t,Pessm_word}$ is the first difference in pessimistic word usage, and $\Delta R_{t,Optism_word}$ is the first difference of optimistic word usage. Also α_0 is a constant and $\gamma_{Speed\ Adj.}$ is the speed adjustment toward long-run equilibrium. The parameter estimates are using monthly data over the time period of January 2003 to October 2008 time periods. The parentheses contain t-statistics. ** and * denote p-values significant at 1% and 5% levels, respectively.

The short-run error correction equilibrium relationships are shown in Table 8. Error correction models are based on the idea that two or more time series exhibit a long-run time varying equilibrium to which the systems tend to converge. The long-run equilibrium influence in the error correction model is achieved through an error correction term which is speed adjustment ($\gamma_{Speed\ Adj.}$). The results from December 2002 to October 2008 show that the corresponding estimated coefficients on the error correction term (speed adjustment) is – 0.331 and is significant at the 1% level. The corresponding estimated coefficient on change in home prices has 0.394 and is significant at the 1 % level. Thus this finding suggests that the error correction term and the change of home prices with two months lags converge as a dynamic adjustment toward long-run equilibrium.

As relative pessimistic or optimistic news about the residential real estate market becomes available, potential buyers and sellers obtain information about the market from public media. In

response, both the buyer and seller populations revise their reservation prices, but not necessarily in identical ways. This is a key to the change in the number of home sales and to the change in home prices. The number of home sales varies overtime through the relative shrinking or expansion of overlapping price ranges of sellers and buyers. The variation of overlapped area has an influence on the change in home prices. Home prices and pessimistic word usage are negatively related with a statistically significant corresponding coefficient of -0.382. The magnitude of the interactive responses to home price is positive 0.226 and statistically significant at 5% level.

Empirical Results from Part II (Controlled Experiment)

Impact of Framing Effects in a Newspaper Article on an Individual's Perception of the Real Estate Market

Profile of Subjects

The experiment was carried out in March 2009 in Atlanta, GA as a controlled experiment. Seventy non-business graduate students at Georgia State University participated in the study The descriptive statistics for the subjects are in Table 9. The subjects ranged in age from 23 to 46. Sixty percent of the subjects were female. Fourteen subjects lived in Atlanta for over 10 years (20.%), while thirteen subjects lived in the area for 5-10 years (18.57%), and 16 subjects for 2-5 years (22.86%). 22 subjects have been living in Atlanta for 1-2 years(31.43%) and 5 subjects have been living in Atlanta less than 1 year (7.14%). The nationality of students shows a balanced proportion of American (52%) and foreign born (48%). Subjects were asked their opinion on the usefulness of news articles in general.

The purpose of the question is about the credibility on newspaper since subjects answer a low level of usefulness of news articles, this result may reduce the credibility of our findings. Three of subjects considered the news articles very useful (4%). 32 subjects considered the news articles useful (46%) and 30 subjects considered them somewhat useful (43%). 7% of subject considers news articles 'not useful'. Additional question is designed to gauge their prior experience in purchasing a single family home. 22 of the subjects (32%) have had experience at purchasing a single family home. These demographical attributes will be further analyzed as indicating variables affecting framing effect in news articles on the residential real estate market, demographic attributes such as gender, nationality, and prior experience of purchasing a single family home.

Table 9 Descriptive Statistics for Participating Subjects (n=70)

Variable	Categories	Number of Subject	Percent
Gender	Male	28	40%
	Female	42	60%
Nationality	U.S.	36	52%
	Non-U.S.	34	48%
Credibility of newspaper	a. very useful	3	4%
	b. useful	32	46%
	c. somewhat useful	30	43%
	d. not useful	5	7%
	e. never useful	0	0%
Experience of purchasing a single family home	Yes	22	32%
	No	48	68%

Experimental Procedure

In this controlled experiment, subjects were randomly assigned to group A given the optimistically framed article (optimistic hereafter) and group B given the pessimistically framed news article (pessimistic hereafter). After reading each framed news article, subjects were asked to answer 10 questions using a seven point Likert scale (Appendix 3-C). The questions were similar consumer confidence questions used in the University of Michigan Confidence Survey, one of the foremost indicators of U.S. consumer sentiment. In detail, the first question (How positive or negative are you about Atlanta's residential real estate market?) is designed to capture market perception. This question is very similar to the last question in the survey (How optimistic or pessimistic are you about Atlanta's residential real estate market?). This is intentional. Comparison of answers to these questions will be used to measure relative subjects' variations on answers on the overall market perception after reviewing questions 5 to 9. Questions 2 through 4 relate to the ease of understanding (Q2 How easy or difficult did you find it to understand the information provided in the article?), trusts (Q3 Do you trust the information provided in the article?), and helpfulness of the given real estate news article (Q4 How helpful was the article to your in gaining an understanding of Atlanta's housing market?). These questions are designed to measure the subjects' response as to the reliability of the differently framed articles.

Questions 5 through 9 are related to the present condition and future expectations of the residential real estate market. In designing the questionnaire, it is difficult to determine how the applied manipulations will affect market sentiment. Thus, the responses to these questions will be useful in interpreting the impact of the manipulations applied. The subjects' perception of current residential market conditions is evaluated with question 7 (How much confidence do you have that the residential real estate market in Atlanta?), question 8 (Considering the last two years, how much volatility has

there been in the Atlanta residential market compared to other U.S. cities?) and question 9 (Would you advise a friend that now is a good time to buy a home in Atlanta?) The subjects' expectations for the residential market is evaluated in question 5 (How serious could the future downside consequences be to the Atlanta residential market?) and question 6 (How great is the risk of housing prices decreasing a substantial amount in the next two years?)

General Responses on Ease of Understanding, Trustworthiness, and Helpfulness of a Given Real Estate News Article as Reliability Measurement

Table 10 highlights the subjects' general responses on ease of understanding, trustworthiness, and helpfulness. These questions are prepared to measure the reliability on the news article. A low score on these questions would suggest a problem with the reliability of the articles and thus reduce the credibility on our findings. The hypothesized mean difference test is used where the standard null hypothesis is that the mean scores are equal.

Table 10 Responses on Ease of Understanding, Trustworthiness, and Helpfulness of News Articles

Questions	Mean Scores		
	Group A	Group B	
	Optimistic	Pessimistic	*p*-value
Q2 Easy or difficult to understand? (1 = Difficult)	5.60	5.40	0.29
Q3 The news article perceived as trustworthy? (1 = Not trustworthy)	4.51	4.60	0.40
Q4 The news article perceived as helpful? (1 = Not helpful at all)	4.54	4.40	0.31

Note: Hypothesized Mean Difference is equal to 0. N=70 subjects. Group A & B are each given framed articles with manipulations described in the previous table 2. We use a 7 point Likert scale to measure their answers, thus the maximum scale is 7 in each question. The definition of scale 1 is explained in parentheses above.

Despite the difference in the tone of the two articles, the responses of group A (optimistic) and B (pessimistic) to these questions are not statistically different from each other. Thus it can be concluded that the subject's level of ease of understanding, trustworthiness, and sense of helpfulness toward the given real estate news articles is not affected by optimistic and pessimistic framing.

Market Sentiment Responses to a Real Estate News Article

Table 11 contains the subjects' responses on market sentiment to a real estate news article. The questions about current market conditions are required to answer the current confidence on residential real estate market (Question 7), volatility in Atlanta's residential market (Question 8) and opinion on timing of buying a home (Question 9). The result shows that the mean scores from groups A (optimistic) and B(pessimistic) are not statistically different from each other. The results suggest that the limited

manipulations applied on a single news article do not influence the individual's perception on current market conditions on.

The questions about future market expectations are the question 5 (Serious future downside consequences be to the Atlanta residential market) and the question 6 (Risk of housing prices decreasing in the next two years). When subjects were asked to judge about the future serious downside consequence of the Atlanta residential real estate market, the subjects' mean scores in both groups A and B are not statistically different from each other. However, the result shows a statistically significant difference on the question 6. The group B (pessimistic) shows a 3.54 mean score which is lower than the 4.45 mean score for group A (optimistic). The mean difference between group A (optimistic) and B (pessimistic)'s perception of risk of decreasing housing price is statistically significant at 5% alpha level. This finding suggests that the limited manipulations adopted in the study may affect an individual's perception of future market expectations.

Table 11 Market Sentiment Responses to Real Estate News Article by Frame

Questions	Mean Scores		
	Group A	Group B	
	Optimistic	Pessimistic	*p*-value
Questions on Future Market Expectation			
Q5 Serious consequences in the market? (1 = Not serious)	4.94	4.97	0.464
Q6 Risk of decreasing housing price? (1 = Great risk)	4.45	3.54	0.010
Questions on Current Market Condition			
Q7 Confidence in the residential market? (1 = Not at all confident)	4.34	4.17	0.280
Q8 Volatility in the residential market? (1 = Less Volatility)	3.71	3.94	0.203
Q9 A good time to buy a home? (1= A bad time to buy)	5.54	5.22	0.175

Note: Hypothesized Mean Difference is 0. N=70 subjects. Group A & B are each given framed articles with manipulations described in the previous table 2. We use a 7 point Likert scale to measure their answers, thus the maximum scale is 7 in each question. The definition of scale 1 is explained in parentheses above.

Analysis of a Market Risk Perception: How Optimistic or Pessimistic Are You about Atlanta's Residential Real Estate Market?

The main purpose of this controlled experiment was to examine if the framing of news articles may affect an individual's perception about a residential real estate market. The primary question was "How optimistic or pessimistic are you about Atlanta's residential real estate market?" In order to find more credibility on the findings, the first question (How positive or negative are you about Atlanta's residential real estate market?) were intentionally designed to capture market perception as the first

question. Comparison of answers to these questions will be used to measure relative subjects' variations on answers on the overall market perception after reviewing questions 5 to 9. The result is shown in Table 12.

Table 12 The Impact of Framing Effect on Market Perception

Questions	Mean Scores		*p*-value
	Group A	Group B	
	Optimistic Article	Pessimistic Article	
Q1 How positive or negative are you about Atlanta's residential real estate market? (1 = Negative)	4.71	3.62	0.001
Q 10 How optimistic or pessimistic are you about Atlanta's residential real estate market? (1= pessimistic)	5.14	4.37	0.003

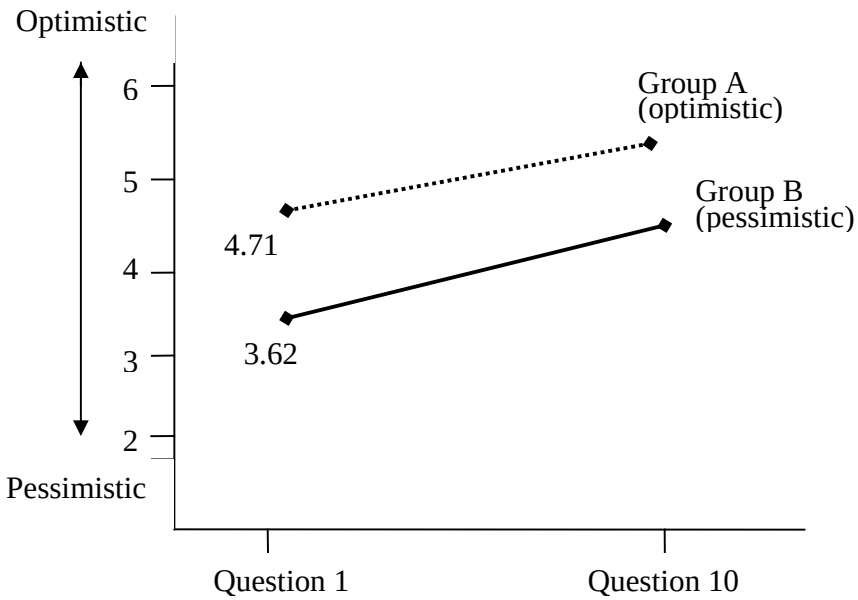
Note: Hypothesized Mean Difference is 0. N=70 subjects. We use a 7 point Likert scale to measure their answers, thus the maximum scale is 7 in each question. The definition of scale 1 is explained in parentheses above.

When subjects were asked to answer Q 1(How positive or negative are you about Atlanta's residential real estate market?), group B (pessimistic) shows a 3.62 mean score which is statistically lower than the 4.71 mean score of group A (optimistic). The mean difference of the two groups on Q 1 is statistically significant at 5% alpha level.

When subjects were asked to answer Q 10(How optimistic or pessimistic are you about Atlanta's residential real estate market?), group B(pessimistic) showed a 4.37 mean score which is lower than the 5.14 mean score for group A(optimistic). The mean difference of the two groups on Q 10 is statistically significant at 5% alpha level. We can infer that the group exposed to the optimistically framed news

article has more positive perception about residential real estate in Atlanta relative to the group exposed to the negatively framed article, respectively. The overall mean scores for Q1 (How positive or negative are you about Atlanta's residential real estate market?) and Q10 (How optimistic or pessimistic they are about Atlanta's residential real estate market?), are compared in figure 5.

Figure 5 Comparison of Market Perceptions between Question 1 and Question 10



Note: This study adopts a 7 point Likert scale to measure their answers. The maximum scale is 7, which represents the most optimistic perception.* and ** denotes significance level at 5% and 1%, respectively.

Question 10 is designed to capture the subjects' market perception similar to Q1. These two similar questions are intentionally listed as the first and last questions. Group B (pessimistic) participants are significantly more pessimistic than Group A in their responses to both questions. However, the mean scores of both groups significantly shift toward more optimism when responding to Q10. Specifically, the mean score for Group A (optimistic) changed from a 4.71 mean score (Q1) to a 5.14 mean score

(Q10), and for group B (pessimistic) the mean score of 3.62(Q1) has also increased to a 4.3 mean score (Q10). These results are statistically significant at 5% and 1% level, respectively. Thus questions (Q5-9) about market risk, two year forecasting, timing to buy a home, and market confidence may have enhanced the subjects' overall understanding of the current residential market.

Controlling for the Effects of Demographic Attributes over Pessimistic Frame

The credibility of the findings is enhanced if it can be show that people's views are not influenced by their demographic attributes. To control for the demographic characteristics that may affect the results, we conduct a regression analysis with demographic variables such as experience in buying a home, nationality, and gender.

Table 13 The Effects of a Pessimistic Frame with Demographic Attributes

	Constant	Pessimistic Frame	Experience Buying Home	Non-U.S.	Gender (Male)	Adj. R^2	F-Stat.
The news article given as optimistic (7 = optimistic)	5.278** (0.000)	-0.841* (0.003)	0.039 (0.892)	-0.436 (0.129)	0.281 (0.342)	0.147	2.811

Note: Table entries are estimated coefficients of indicator variables and the p-value is in parentheses. The reference variables are groups exposed to optimistic framed article, groups with no experience in buying home, U.S. citizens, and female, respectively. * and ** indicate significance at the 5% and 1% levels.

In Table 13, the results show that the pessimistic frame is the only statically significant variable at the 1% level. Thus, suggesting that the results rely solely on the pessimistic manipulation.

Accordingly, pessimistic framing has affected subjects across all demographical lines in terms of gender, nationality, and prior experience in buying a home.

CHAPTER FIVE

Conclusion and Future Directions

Overview of Conclusion from Theoretical Applications

This study examines the underlying links between the content of real estate news articles and activity in the residential real estate markets. Furthermore this study also adopts a controlled experiment to explore this relationship at the individual level. The theoretical underpinnings of this research includes a two-system-view of cognitive processing, affect heuristics, and the framing effect.

According to Kahneman's (2003) two-system view of cognitive processing, the human mind does not functionally separate perception and intuition from reasoning. Language, in this case through newspaper content, may potentially impact an individual's perceptions which may then in-turn influence their reasoning process. Thus newspaper content may indirectly influence residential real estate activity by influencing the perceptions of the market participants.

In addition to the above cognitive process, an individual will adopt relevant heuristics to solve a complex task. In contemplating the workings of the affect heuristic, pessimistic word usage and optimistic word usage can be used to depict an object, in this case residential real estate, as a relative "good thing" or "bad thing" respectively. Thus people may internalize these depictions and use them in the future as heuristics in expedited decision making.

Finally, this study looks at the framing effects associated with newspaper articles as it relates to residential real estate. The framing effect relates to how an issue is characterized in a news article.

Framing makes people focus on certain aspects of a social phenomenon through manipulation. Framing may also be used to draw attention away from other aspects of a situation causing those aspects to be largely ignored. In this sense, the framing effect is adopted to explain how differently framed news articles affect people's overall perceptions of the residential real estate market.

Conclusions from Part I

In Part 1, this research adopts content analysis to generate relevant data to test the underlying relationship between the content of a local newspaper and activity in the residential real estate market. Pessimistic or optimistic word usage may play an important role in the perceptual and intuitive system thereby generating a relative overall perception of the residential real estate market. Correspondingly, this study tests whether the content of newspaper affects some portion of an individual's reasoning process, which in turn can effect on market activity, the home prices.

This study uses the Johansen methodology to test for cointegration and provide evidence of a long-run equilibrium relationship between word usage and real estate market activity in the research period (2002 – 2008). The pessimistic and optimistic word usage affects people's market perception in the residential real estate market which in turn, influences their transacted price. Also the number of home sales positively relates to the changes of home prices.

In addition, although it is not reported in the study, two other economic variables, the unemployment rate for Atlanta MSA and the 30-year Fixed Rate Mortgage interest rate have been tested. However, these two variables do not suggest Granger cause to pessimistic words. Adding mortgage interest rates as a variable supported the long-run equilibrium model, but the unemployment rate for Atlanta MSA does not support a long-run equilibrium relation that is supported by the Johansen

Cointegration test. It may relate to the relative stabilized unemployment rate in Atlanta and therefore does not provide significant theoretical motivation to link pessimistic news and change in home price. Thus this study focused more on the internal validity of research with the aim of detecting the underlying relationship among our research variables, which were strongly supported by theory. The current study therefore decides to leave these economic variables for future study of a single family pricing model or rational pricing model. However, the future research may further incorporate the current behavioral standpoint and macro economic standpoint by adopting the circulative underlying relationship between content of newspaper and market economic indicators.

Conclusion from Part II

The framing effect is tested using news articles about the local residential real estate market. The articles are manipulated using optimistic or pessimistic framing. This study uses professional opinions, comparisons with other markets, and the use of emotional words (pessimistic or optimistic) to manipulate the subjects through news articles. This study finds that subjects exposed to optimistically framed news articles are likely to develop a more optimistic perception of the residential real estate market. Conversely, people exposed to pessimistically framed news articles are likely to develop a more negative perception toward the same market. Thus framing can be used to influence the public's overall market perception of the local residential real estate market.

Also it is possible that people may react differently depending on the length of exposure to framed information about the residential real estate market. Accordingly, future research may focus on framing effects which relate both to the length of time exposed, and the size of the articles. The current research findings provides a foundation for this research, giving a basis for comparison.

In our study, the respondents' demographical information has been analyzed as homogeneous group. However, if future studies can gain access to additional classified groups such as those under financial distress, the results may provide more evidence about values and predispositions that make it easy to accept or reject framing effects.

In the experiment, only a few limited manipulations are used with the majority of content remaining the same in both differently framed articles. This, of course, is done to maximize the internal validity of the study. Thus, future research will strengthen external validity if it adopts applied manipulations widely used in print media.

In. conclusion, this research attempts to lay down a foundation for the relationship between print media and real estate market perceptions. However much needs to be done. In addition to print media, television and the internet have become dominant forces in the way people accumulate information and develop opinions about many things including real estate. All media can be framed. And the understanding of the impact of media framing on human perceptions will ultimately be fundamental to our understanding of real estate markets

REFERENCES

Aday, S. (2006). The Framing Effects of News: An Experimental Test of Advocacy versus Objective Frames. *Journalism & Mass Communication Quarterly, 83*(4), 767-784.

Black, R. T., Diaz III, J.,& Wolverton, M. L. (1997). Examination of the Effect of Buyer Agency on the Distribution of Closing Costs. *Journal of Real Estate Research, 14*(1/2), 43.

Case, K. E., & Shiller, R. J. (2003). Is There a Bubble in the Housing Market? *Brookings Papers on Economic Activity*(2), 299-362.

Diaz III, J. (1990). How Appraisers Do Their Work: A Test of the Appraisal Process and the Development of a Descriptive Model *Journal of Real Estate Research, 5*(1).

Diaz III, J. (1990). The Process of Selecting Comparable Sales. . *The Appraisal Journal* (Oct.).

Diaz III, J. (1993). Science, Engineering, and the Discipline of Real Estate. *Journal of Real Estate Literature*(1), 183-195.

Diaz III, J. (1997). An Investigation into the Impat of Previous Expert Value Estimates on Appraisal Judgement. *Journal of Real Estate Research, 13*(1), 57-66.

Diaz III, J., Gallimore, P., & Levy, D. (2002). Residential Valuation Behaviour in the United States, the United Kingdom, and New Zealand. *Journal of Property Research 19*(4).

Diaz III, J., & Hansz, J. A. (2001). The use of reference points in valuation judgment. *Journal of Property Research, 18*(2), 141-148.

Diaz III, J., & Hansz, J. A. (2001). Valuation Bias in Commercial Appraisal: A Transaction Price Feedback Experiment. *Real Estate Economics, 29*(4), 553.

Diaz III, J., & Hansz, J. A. (2002). *Behavioral Real Estate Research into the Appraisal Process."* (Vol. 8). Boston: Blackwell Publishing Limited.

Diaz III, J., & Wolverton, M. L. (1998). A longitudinal examination of the appraisal smoothing hypothesis. *Real Estate Economics, 26*(2), 349-358.

Erikson, R. S., MacKuen, M. B., & Stimson, J. A. (2002). *The Macro Polity*. Cambridge Cambridge University Press.

Finucane, M. L., Alhakami, A., Slovic, P., & Johnson, S. M. (2000). The Affect Heuristic in Judgments of Risks and Benefits. *Journal of Behavioral Decision Making, 13*(1), 1-17.

Goffman, E. (1974). *Frame Analysis : an Essay on the Organization of Experience* Harvard University Press

Gross, K., & D'Ambrosio, L. (2004). Framing Emotional Response. *Political Psychology, 25*(1), 1-29.

Hardin, W. (1997). Heurisitc Use, Credit Constraints and Real Estate Lending. . *Journal of Property Valuation and Investment 15*(3).

Holtgrave, R. D., & Weber, U. E. (1993). Dimensions of Risk Perception for Financial and Health Risks. *Risk Analysis 13*(5), 553-558.

Johansen, S. (1991). Estimation and hypothesis testing of cointegrationg vectors in Gaussian vector autoregressive models. *Econometrica 59*, 1551-1580.

Johansen, S. (1995). Lieklihood-Based Inference in Cointegrated Vector Autoregressive Models. *Oxford University Press, Oxford*.

Johansen, S., & Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with application to the demand for money. *Oxford Bullentine of Economics and Statistics, 52*, 169-209.

Kahneman, D. (2003). A Perspective on Judgement and Choice. *American Psychologist, 58*(9), 697-720.

Kahneman, D., Slovic, P., & Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. New York Cambridge University Press.

Kahneman, D., & Tversky, A. (1974). Judgment under uncertainty: Heuristics and biases. *Science, 185*, 11.

Kahneman, D., & Tversky, A. (1984). Choices, values and frames. *American Psychologist, 39*.

Kahneman, D., & Tversky, A. (2000). Choices, values and frames(Ed). *American Psychologist, 39*.

Kelly, M. C., & Jacoby, L. L. (1996). Adult Egocentrism: Subjective Experience versus Analytic Bases for Judgment. *Journal of Memory and Language, 35*(4).

McCombs, M. E., & Shaw, D.L. (1972). The agenda-setting function of mass media. . *Public Opinion Quarterly, 36*(2), 176-187.

Mori, M. (2006). Why Do Borrowers Choose ARMS over FRMS?: A Behavioral Investigation in the U.S. and Japan. Unpublished Working Paper

Pan, Z., & Kosicki, G. M. (1993). Framing Analysis: An Approach to News Discourse. *Political Communication, 10*(1), 55-75.

Reber, R., Winkielman, P., & Schwarz, N. (1998). Effects of perceptual fluency on affective judgments. *Psychological Science, 9*(1), 45.

Reese, S. D. (2007). The Framing Project: A Bridging Model for Media Research Revisited. *Journal of Communication, 57*(1), 148-154.

Scheufele, D. A., & Tewksbury, D. (2007). Framing, Agenda Setting, and Priming: The Evolution of Three Media Effects Models. *Journal of Communication, 57*(1), 9-20.

Semetko, H. A., & Valkenburg, P. M. (2000). Framing European politics: A content analysis of press and television news. *Journal of Communication, 50*(2), 93.

Simon, H. A. (1973). The Structure of Ill-Structured Problems. . *Artificial Intelligence, 4*, 20.

Simon, H. A. (Ed.). (1978). *Information-Processing Theory of Human Problem Solving. In W.K. Estes(Ed), Handbook of Learnning and Cognitive Processes* (Vol. 5). Hillsdale, NJ: Earlbaum.

Slovic, P., & Alhakami, A. S. (1994). A Psychological Study of the Inverse Relationship Between Perceived Risk and Perceived Benefit. *Risk Analysis: An International Journal, 14*(6), 1085-1096.

Slovic, P., Finucane, M., Peters, E., & MacGregor, D. G. (2002). Rational actors or rational fools: implications of the affect heuristic for behavioral economics. *Journal of Socio-Economics, 31*(4), 329.

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2004). Risk as Analysis and Risk as Feelings: Some Thoughts about Affect, Reason, Risk, and Rationality. *Risk Analysis: An International Journal, 24*(2), 311-322.

Soroka, S. N. (2006). Good News and Bad News: Asymmetric Responses to Economic Information. *Journal of Politics, 68*(2), 372-385.

Stryker, J. E., Wray, R. J., Hornik, R. C., & Yanovitsky, L. (2006). Validation of database search terms for content analysis: The case of cancer news coverage. . *Journalism & Mass Communication Quarterly*.

Tetlock, P. C. (2007). Giving Content to Investor Sentiment: The Role of Media in the Stock Market. *Journal of Finance, 62*(3), 1139-1168.

Tetlock, P. C., Saar-Tsechansky, M., & Macskassy, S. (2008). More Than Words: Quantifying Language to Measure Firms' Fundamentals. *Journal of Finance, 63*(3), 1437-1467.

Tversky, A., & Kahneman, D. (1981). The Framing of Decisions and the Psychology of Choice *Science, 211*.

Wolverton, M. L., & Gallimore, P. (1999). Client Feedback and the Role of the Appraiser. *Journal of Real Estate Research, 18*(3), 415.

Wood, B. D., Owens, C. T., & Durham, B. M. (2005). Presidential Rhetoric and the Economy. *Journal of Politics, 67*(3), 627-645.

APPENDIX 1

Table. 1A Metro Areas for the Atlanta S&P/Case-Shiller Home Price Indices.

Region	Represented Counties
S&P / Case Shiller Atlanta	Barrow County, Bartow County, Butts County, Carroll County, Cherokee County, Clayton County, Cobb County, Coweta County, Dawson County, De Kalb County, Douglas County, Fayette County, Forsyth County, Fulton County, Gwinnett County, Haralson County, Heard County, Henry County, Jasper County, Lamar County, Meriwether County, Newton County, Paulding County, Pickens County, Pike County, Rockdale County, Spalding County, Walton County.

Source: Standard Poor's Data Web Site.

APPENDIX 2

Table 2A

Harvard IV-4 categories

Classification	
Pstv	1045 positive words, an earlier version of *Positiv*. A subset of 557 words are also tagged *Affil* for words indicating affiliation or supportiveness
Ngtv	1160 negative words, an earlier version of *Negativ*. A subset of 833 words are also tagged *Hostile* for words indicating an attitude or concern with hostility or aggressiveness.
Strong	1902words implying strength. A subset of 689 words are tagged *Power*, indicating a concern with power, control or authority.
Weak	755 words implying weakness. A subset of 284 words are also tagged *Submit*, connoting submission to authority or power, dependence on others, vulnerability to others, or withdrawal.
Active	2045 words implying an active orientation.
Passive	911 words indicating a passive orientation
Words of pleasure, pain, virtue and vice	*Pleasur*168 words indicating the enjoyment of a feeling, including words indicating confidence, interest and commitment.
	*Pain*254 words indicating suffering, lack of confidence, or commitment.
	Feel 49 words describing particular feelings, including gratitude, apathy, and optimism, not those of pain or pleasure.
	Arousal 166 words indicating excitation, aside from pleasures or pains, but including arousal of affiliation and hostility.
	*EMOT*311 words related to emotion that are used as a disambiguation category, but also available for general use.
	*Virtue*719 words indicating an assessment of moral approval or good fortune, especially from the perspective of middle-class society.
	*Vice*685 words indicating an assessment of moral disapproval or misfortune.
	Ovrst "Overstated", 696 words indicating emphasis in realms of speed, frequency, causality, inclusiveness, quantity or

quasi-quantity, accuracy, validity, scope, size, clarity, exceptionality, intensity, likelihood, certainty and extremity.
"*Undrst* Understated", 319 words indicating de-emphasis and caution in these realms.
*Academ*153 words relating to academic, intellectual or educational matters, including the names of major fields of study.
*Doctrin*217 words referring to organized systems of belief or knowledge, including those of applied knowledge, mystical beliefs, and arts that academics study.
*Econ@*510 words of an economic, commercial, industrial, or business orientation, including roles, collectivities, acts, abstract ideas, and symbols, including references to money. Includes names of common commodities in business.
Exch 60 words concerned with buying, selling and trading. There is also a related *ECON* category with 502 words (269 in common with *Econ@*) that is used by the General Inquirer in disambiguating.
*Exprsv*205 words associated with the arts, sports, and self-expression. Note: Separate *Sports* (186 words) and *Arts* (138 words) categories have recently been created and will be added to the spreadsheet.
*Legal*192 words relating to legal, judicial, or police matters.
*Milit*88 words relating to military matters.
Polit@ 263 words having a clear political character, including political roles, collectivities, acts, ideas, ideologies, and symbols. Caution: There is also a *POLIT* broader category of 507 words that is used in disambiguation. *Relig* 103 words pertaining to religious, metaphysical, supernatural or relevant philosophical matters.
*Role*569 words referring to identifiable and standardized individual human behavior patterns, as used by sociologists.
*COLL*191 words referring to all human collectivities (not animal). Used in disambiguation.

	*Work*261 words for socially defined ways for doing work.
	Ritual 134 words for non-work social rituals.
	SocRel 577 words for socially-defined interpersonal processes (formerly called "IntRel", for interpersonal relations). Ascriptive social categories as well as general references to people and animals
	*Race*15 words (with important use of words senses) referring to racial or ethnic characteristics.
	*Kin@*50 terms denoting kinship.
	*MALE*56 words referring to men and social roles associated with men. (Also used as a marker in disambiguation)
	*Female*43 words referring to women and social roles associated with women.
	*NonAdlt*25 words associated with infants through adolescents.
	*HU*795 general references to humans, including roles
	*ANI*72 references to animals, fish, birds, and insects, including their collectivities.
References to places, locations and routes between them.	*Place* category with 318 words subdivided into *Social* (111 words for created locations that typically provide for social interaction and occupy limited space), *Region* (61 words), *Route,* (23 words), *Aquatic* (20 words), *Land* (63 words for places occurring in nature, such as desert or beach) and *Sky* (34 words for all aerial conditions, natural vapors and objects in outer space). References to objects.
Object	*Object*category with 661 words subdivided into *Tool,* (318 words), *Food* (80 words), *Vehicle* (39 words), *BldgPt* (46 words for buildings, rooms in buildings, and other building parts), *ComnObj* (104 words for the tools of communication) and *NatObj* (61 words for natural objects including plants, minerals and other objects occurring in nature other than people or animals). Last, a list of 80 parts of the body (*BodyPt*)
Processes of communicating	*ComForm* 895 words relating to the form, format or media of the communication transaction. Note: there is also a category *COM* of 412 communications

	words used in disambiguation. *Say* 4 words for say and tell.
Motivation-related words:	*Need* 76 words related to the expression of need or intent. *Goal* 53 names of end-states towards which muscular or mental striving is directed. *Try* 70 words indicating activities taken to reach a goal, but not including words indicating that the goals have been achieved. *Means* 244 words denoting objects, acts or methods utilized in attaining goals. Only 16 words overlap with Lasswell dictionary 77-word category *MeansLw*. *Persist* 64 words indicating "stick to it" and endurance. *Complet* 81 words indicating that goals have been achieved, apart from whether the action may continue. The termination of action is indicated by the category *Finish*. *Fail* 137 words indicating that goals have not been achieved.
Other process or change words:	*NatrPro* 217 words for processes found in nature, birth to death. Change process categories *Begin* (56 words), *Vary* (98 words indicating change without connotation of increase, decrease, beginning or ending), *Increas* (increase, 111 words)), *Decreas* (decrease, 82 words) and *Finish* (87 words). Movement categories, including *Stay* (125 words), *Rise* (25 words), *Exert* (194 words), *Fetch* (79 words, includes carrying) *Travel* (209 words for all physical movement and travel from one place to another in a horizontal plane) and *Fall* (42 words).
Cognitive orientation (knowing, assessment, and problem solving)	*Think* 81 words referring to the presence or absence of rational thought processes. *Know* 348 words indicating awareness or unawareness, certainty or uncertainty, similarity or difference, generality or specificity, importance or unimportance, presence or absence, as well as components of mental classes, concepts or ideas. *Causal* 112 words denoting presumption that occurrence of one phenomenon is necessarily preceded, accompanied or followed by the occurrence of another. *Ought* 26 words indicating moral imperative. *Perceiv* 192 words referring to the perceptual process of recognizing or identifying something by means of the senses. *Compare* 21 words of comparison. *Eval@* 205 words which imply judgment and evaluation, whether positive or negative, including means-ends

	judgments. Note: there is also a broader, different *EVAL* category with 314 evaluative words that is used in disambiguation. *Solve* 189 words (mostly verbs) referring to the mental processes associated with problem solving. *Abs@* 185 words reflecting tendency to use abstract vocabulary. There is also an *ABS* category (276 words) used as a marker. *Quality* 344 words indicating qualities or degrees of qualities which can be detected or measured by the human senses. Virtues and vices are separate. *Quan* 314 words indicating the assessment of quantity, including the use of numbers. Numbers are also identified by the *NUMB* category (51 words) which in turn divides into *ORD* of 15 ordinal words and *CARD* for 36 cardinal words. *FREQ* 46 words indicating an assessment of frequency or pattern of recurrences, as well as words indicating an assessment of nonoccurrence or low frequency. (Also used in disambiguation) *DIST*`19 words referring to distance and its measures. (Used in disambiguation) *Time@* 273 words indicating a time consciousness, including when events take place and time taken in an action. Includes velocity words as well. There is also a more restrictive *TIME* category (75 words) used as a marker for disambiguation. *Space* 302 words indicating a consciousness of location in space and spatial relationships. There are also two more specialized marker categories for disambiguation *POS* (35 words for position) and *DIM* (49 words for dimension). *Rel* 136 words indicating a consciousness of abstract relationships between people, places, objects and ideas, apart from relations in space and time. *COLOR* 21 words of color, used in disambiguation.
Pronouns reflecting an "I" vs. "we" vs. "you" orientation, as well as names:	*Self* 7 pronouns referring to the singular self *Our* 6 pronouns referring to the inclusive self ("we", etc.) *You* 9 pronouns indicating another person is being addressed directly. *Name* only contains 86 names identified in the Harvard IV dictionary. More names are recognized by the Lasswell dictionary, as in the category *Nation*. "Yes", "No", negation and interjections. *Yes* is 20 words directly indicating agreement, including word senses "of course", "to say the least", "all right".

	No is 7 words directly indicating disagreement, with the word "no" itself disambiguated to separately identify absence or negation. Note: These two categories only occur frequently enough to be of interest in interviews. *Negate* has 217 words that refer to reversal or negation, including about 20 "dis" words, 40 "in" words, and 100 "un" words, as well as several senses of the word "no" itself; generally signals a downside view. *Intrj* has 42 words and includes exclamations as well as casual and slang references, words categorized "yes" and "no" such as "amen" or "nope", as well as other words like "damn" and "farewell".

Source : the Harvard IV-4 dictionary

APPENDIX 3

(A) Optimistic Framed Article

Area home prices drop 11.2% in year: Atlanta's housing bubble didn't burst as soon or as badly as elsewhere

Metro Atlanta home prices have fallen along with those in the rest of the nation's largest urban areas during the past year, but the decline here did not happen as quickly, according to a high-profile ranking released Tuesday. In the 20 largest metropolitan areas, home prices in November 2008 were down an average of 18.2 percent from November 2007, according to Standard & Poor's Case-Shiller Home Price Index. The drop in Atlanta was 11.2 percent over the one-year period.

While the report was not quite as bad as some had expected, the worst of the damage has happened in cities that led the housing bubble earlier this decade. For example in metropolitan Phoenix home prices dropped 32.9 percent in one-year; in Las Vegas home prices decreased by 31.7 percent; and in San Francisco home prices fell 30.8 percent. In contrast, metro Atlanta, which was continually among the nation’s leaders in home construction, saw prices steadily advance, but never at the same pace as other cities that led the housing bubble. So while Atlanta's real estate market has been declined, it has not suffered quite as much with its drop of 11.2 percent over the one-year period of the survey, according to Case-Shiller. From October 2008 to November 2008, Atlanta home prices slipped 2.7 percent topped out and started to slip in mid-2006 --- a full year before prices crested in Atlanta. By November 2008, Atlanta’s homes prices had dropped 14.6 percent from that peak. In contrast, the overall index is down 25 percent.

A recent poll taken by the Department of Real Estate at Georgia State University, of real estate industry leaders found that more than 75 percent of the respondents consider the condition of the Atlanta economy and real estate market to be at a fair and good. Only 18.42 percent of the respondents answered poor, and 5.26 percent answered falling.
A majority of respondents anticipated a two-year stabilizing period for the Atlanta area.

(B) Pessimistic Framed Article

Area home prices drop 11.2% in year: Atlanta shocked by current real estate crisis

Over the past few years, Americans have had a brutal lesson in the risks of a real estate crisis. Housing prices have crashed by more than 35% in some parts of the country; millions of people are losing their homes to foreclosure; and banks are bankrupt and failing. In the 20 largest metropolitan areas, home prices in November 2008 were down an average of 18.2 percent from November 2007, according to Standard & Poor's Case-Shiller Home Price Index. While Atlanta's real estate market has been badly pounded, it has not suffered quite as much with its decline of 11.2 percent over the one-year period of the survey, according to Case-Shiller. From October 2008 to November 2008, Atlanta's home prices slipped 2.7 percent. And by November 2008, Atlanta's home prices had dropped 14.6 percent from that peak.

In light of these pessimistic figures presented, most professionals worry about the current residential real estate market collapse. According to a recent poll taken by the Department of Real Estate at Georgia State University, of real estate industry leaders, economy and real estate market conditions in Atlanta are falling (5.26 percent of the respondents) poor (18.42 percent of the respondents) or fair (65.79 percent of the respondents).
Remarkably, a majority of respondents, forecast a two-year recessional period for the Atlanta area.

The findings from this recent survey of real estate professionals are concerning to these hoping that housing prices will bounce back. Economists and real estate professionals generally say falling home prices won't bottom out before the second half of 2009, and some don't see a bottom until 2010 or 2011.

(C) A list of questions

Q.1 How positive or negative are you about Atlanta's residential real estate market?

1	2	3	4	5	6	7
Negative						Positive

Q.2 How easy or difficult did you find it to understand the information provided in the article?

1	2	3	4	5	6	7
Very Difficult						Very Easy

Q.3Do you trust the information provided in the article?

1	2	3	4	5	6	7
Not Trustworthy						Very Trustworthy

Q.4How helpful was the article to your in gaining an understanding of Atlanta's housing market?

1	2	3	4	5	6	7
Not Helpful at all						Very Helpful

Q.5How serious could the future downside consequences be to the Atlanta residential market?

1	2	3	4	5	6	7
Not Serious						Very Serious

Q.6How great is the risk of decreasing a substantial amount of housing price for next two years?

1	2	3	4	5	6	7
Great Risk						Not Much Great

Q.7How much confidence do you have that the residential real estate market in Atlanta will rebound within 2 years?

1	2	3	4	5	6	7

Not at all Confident Very Confident

Q.8Considering the last two years, how much volatility has there been in the Atlanta residential market compared to other U.S. cities?

1	2	3	4	5	6	7
Less Volatility						More Volatility

Q.9 Would you recommend to a friend that now is a good time to buy a home in Atlanta?

1	2	3	4	5	6	7
No. This is a bad time to buy						Yes. This is a great time to buy

Q. 10 How optimistic or pessimistic are you about Atlanta's residential real estate market?

1	2	3	4	5	6	7
Pessimistic						Optimistic

AUTHOR'S VITA

Changha Jin was born in Seoul, Korea, on February 16, 1977. He graduated from Konkuk University, Seoul, Korea, in February of 1999, with a B.A. in Commerce and Economics, majoring in International Trade. He volunteered for the Army ROTC program at Konkuk University. While serving as an officer in the Korean Army from March of 1999 until June of 2001, he learned about social responsibility and leadership.

In May of 2005, he received his Master of Science in Real Estate from Georgia State University. He enrolled in the Ph.D. in Business Administration, majoring in Real Estate in the Robinson College of Business at Georgia State University in August of 2005. He successfully defended his dissertation on April 20, 2009.

Mr. Jin has presented research papers to the American Real Estate Society (ARES), and he received the American Real Estate Society 2007 Best Paper on Real Estate Finance sponsored by the Federal National Mortgage Association (FNMA). During the doctoral program, he has published his research in the Journal of Real Estate Portfolio Management, and the International Real Estate Review. Mr. Jin has accepted a position as Assistant Professor in the College of Business at the University of Texas - Pan American.

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