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Integrating Value at Risk (VaR) Model into Behavior Economics for Consumer Behavior Marketing and Decision Analysis

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Abstract: This overview paper supplies a background for a potential suppose of a new research dimension, based on Value at Risk model analysis applying in a point of view based on behavior economics, and supposed theory of using the models of Value at Risk. This article proposes a novel research avenue by melding the Value at Risk (VaR) model with behavioral economics, aiming to enrich our comprehension and forecasting of consumer behavior in the marketing domain. The paper underscores the significance of the discussed topics, encompassing the VaR model, marketing strategies, consumer behavior patterns, behavioral economics, and a concise touch on econometric tools. Hypotheses are presented, showcasing a regression model that holds the potential to significantly contribute to upcoming research endeavors. The foundational context and recommended methodologies of this study are tailored to spotlight specific market segments when gauging market reactions. By employing this combined model, researchers can delve into the behavior of consumers within specific geographical or economic markets, offering insights into their likely reactions to shifts in the price of merit goods. This approach beckons further exploration in correlating domains, encompassing classical economics, marketing insights related to consumer behavior, and the broader realm of behavioral economics.

Keywords: Combination research, Value at Risk model, Behavioral Economics, Consumer Behavior in Marketing

1. Introduction

This paper provides a proposition for a new research dimension by integrating the Value at Risk (VaR) model with behavioral economics for enhanced understanding and prediction of consumer behavior in marketing. Supposed research may show significant help with both policies design and introduction prediction and responsiveness of economic features to fiscal or other legislations as well. In the paper, there is hypothesis that shows a regression model generating measure, which may provide immense help with future research. One of the specific models is applied to analyze consumer's behavior within a geographical or economical specific market (or a known sample box), and to analyze simply the responsiveness of these consumers to change in one of the merit good's price-to inspire future studies

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in relative dimensions, not only in traditional economic ways, but also marketing about consumer behavior and behavior economics.

2. Overview of Value at Risk (VaR) Model

Value at Risk (VaR) is a widely used tool to measure potential losses in the value of a risky asset or portfolio within a defined period, given a set confidence interval. Value at Risk (VaR) is a search that is used to forecast the biggest potential losses over a certain period of time and has been dubbed the "new science of risk management [1]. Among other things, financial organizations utilize VaR to assess prospective losses caused by unfavorable market movements. VaR has drawbacks despite its widespread use, including issues with tail risk, the normality assumption, and dependence on historical data. In general, Value at Risk (VaR) model is applied to measure potential lost in value of a risky asset or portfolio over a defined period for a given confidence interval. Financial organizations like J.P. Morgan helped to promote the approach in the 1990s with the help of its RiskMetrics system. Since then, it has evolved into a risk management industry standard. Risk management, regulatory compliance, performance evaluation, and asset allocation are some applications of VaR. Financial institutions and other relative organizations employ VaR for portfolios' potential losses understanding due to adverse market movements. For regulators, they use VaR models to assess capital adequacy of financial institutions as regulatory compliance. The models are applied by some institutions to compare risk-adjusted performance of different portfolios or traders. For asset managers, VaR to perfect the allocation of assets in a portfolio to achieve a risk level requirement. According to concerns about tail risk, VaR does not supply information on the extent of losses beyond the VaR limit, which becomes a problem when markets are highly volatile, when losses can largely exceed forecasts. Many VaR models assume that financial returns follow a normal distribution. However, financial returns often have large and skewed tails, which can cause VaR to underestimate risk. VaR is not yet consistently clustered across portfolios.

The joint VaR of two portfolios can exceed the sum of their separate VaRs. VaR models, especially those using historical simulation, assume that past patterns are reliable predictors of future events, which may not be the case. true during unprecedented market crashes. Instructions for implementation are incomplete. Whilst Value at Risk model is functional in several dimensions of analysis and research, there are still some limitations of VaR: tail risk, assumption of normality, non-subadditivity, historical dada dependency and lack of actionable insights. Although VaR has been a groundbreaking tool in risk management, it's essential to understand its limitations. Literature on VaR spans from its technical intricacies to its broader implications in the financial world. Researchers and practitioners have since developed alternative measures (like CVaR or Expected Shortfall) to address VaR's shortcomings. In other parts of this paper, there might be an ideal method of generating new VaR applications, for micrified usages of analyzations. One of the core incentives for behavioral economic is to face the increasing disappointment with how economic science deal with real-world challenges. Therefore, it must be possible future applications of behavioral economic engineering using Value at Risk models and derivatives, to analyze and modeling regress the possible changes of market variances, and to makeup quantified models serving for other mathematical research of economics. For instance, when the portfolio loss estimators are created using such methods, substituting them for the portfolio VaR estimation in the KQE would result in a decrease in variance. The associated CVaR estimator may also be more effective as a result [2].

3. Behavioral Economics and its Influence

Behavioral economics studies how cognitive, psychological, and environmental factors influence decision-making. The subject introduces psychological realism into the economic framework. It

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acknowledges that psychological biases, emotional reactions, and social factors influence economic decisions. Concepts like "loss aversion" and "nudge theory" have been fundamental in explaining various economic phenomena and offering nuanced insights into decision-making processes. For instance, it is dubious if officials should commit to forming morally "sound" preferences: it is difficult to determine how to assess preferences. As behavioral economy is a subject of research that analysis the psychological determinants of consumer actions significantly mold economic decision-making processes [3]. Which intersects psychology and economics, endeavors to decipher the way cognitive functions. Within the interdisciplinary domain of behavioral economics, the psychological determinants of consumer actions significantly mold economic decision-making processes. This field, which intersects psychology and economics, endeavors to decipher the way cognitive functions, emotional reactions, and societal factors sway individuals' economic selections. Financial, democratic, and commercial realms have all seen the use of behavioral economics. Numerous studies have accentuated the critical influence of psychological elements on economic decisions [4]. For decades, the notion of homo economicus has been one of the core assumptions of traditional and neoclassical economic theories. For instance, the principle of "loss aversion," delineated by Kahneman and Tversky, illustrates that individuals show a propensity to prioritize circumventing losses over securing equivalent gains, spotlighting a psychological imbalance in decision-making. This principle has been employed to elucidate diverse economic phenomena, such as the disposition effect in stock trading and the equity premium puzzle. In addition, the "nudge theory," propagated by Thaler and Sunstein, proves how subtle alterations in policy can "nudge" individuals towards decisions that are more helpful without infringing upon their choice autonomy. Such theory has been implemented across various sectors, including finance, healthcare, and public policy, to steer individuals towards decisions that perfect their welfare, thereby enhancing societal well-being. The "prospect theory", which is another pivotal concept in behavioral economics that posits individuals' base decisions on the perceived value of losses and gains rather than the absolute outcome. This theory elucidates that individuals assess potential outcomes compared to a specific reference point, often their present state, and exhibit risk-averse behavior concerning gains and risk-seeking behavior concerning losses. Research also explores the role of heuristics and biases in economic decision-making. For instance, the "availability heuristic" explicates that individuals tend to formulate decisions based on readily accessible information, often leading to biased judgments. Similarly, the "confirmation bias" elucidates that individuals show a tendency to look for, interpret, and recall information that affirms their pre-existing beliefs, potentially distorting their economic decisions.

Moreover, studies investigating "time inconsistency" reveal that individuals often prove a preference for smaller, immediate rewards over larger, delayed ones, a phenomenon termed hyperbolic discounting. This inconsistency in intertemporal choices has implications for comprehending behaviors related to investment, savings, and consumption. Nevertheless, with the advancements in behavioral economics, concerns are being raised regarding how economists and policymakers should approach such philosophical issues of "meta-preferences [5].

4. Traditional vs. Behavioral Economics

Traditional economics assumes that individuals are rational thinkers, focusing primarily on maximizing utility. In contrast, behavioral economics considers psychological factors, leading to a more comprehensive understanding of economic behaviors and market dynamics. Contrary to conventional economic theory, behavioral economics research findings imply that elements such as cognition and behavior can affect decisions at every stage in a way that is not taken into consideration by conventional economic models [6]. In essence, behavioral economics provides a multifaceted framework of insights that illuminate the intricate interplay between psychology and economics. By investigating how cognitive biases, emotional factors, and social influences permeate economic

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decision-making, researchers in this field ease the development of more efficacious policies, strategies, and interventions that resonate with the intricate nature of human behavior. This exploration not only amplifies our comprehension of economic phenomena but also propels the evolution of a more insightful and humane economic research, for the subject as a social science. As two branches of economics studies, which have distinct approaches towards understanding for decision making and market phenomena. Behavioral economics can show how to take advantage of or circumvent these protections for the best behavior. While traditional economics supply foundational understanding framework of economic principles, and market behaviors as well. The greatest difference between behavioral economics and traditional economics is the combined research method applying psychology. With fundamentals from psychology, predictions and future planning of marketing can be more exact and suitable for each of the specific market worldwide [7]. When firms are boosted with better understanding of consumers' potential behaviors, both sales and estimated rate of interest will be higher, which supplies a better marketing and customer friendly relationship circulation between firm and market. On the other hand, such enhancement on marketing method supplies higher efficiency for both firms' marketing actions in the future. In the game of market competition, such quantitative method to help dealing with analysis about consumers' behavior results in one or a series of markets or industries. One of the shortcomings of traditional economy is the ignorance of most psychological reasons' analysis and consideration when regressing or estimating the possible relationship and results of a policy's introduction. Even though applying econometric methods. To another extent, traditional economics assumes that individuals respond predictably to incentive and that their preferences are both materialistic and selfish. Therefore, traditional economics only discuss about consumers' behavior based on the assumption that they are all rational thinkers, ignoring the psychological logic chain within their decision-making process. Then it is necessary to applicate behavioral economics, which uses the understanding of psychological reason chain to help analysis or predict possible results and decisions that consumers will make during the process, to help estimate the decisions that consumers may choose.

5. Consumer Behavior in Marketing

Consumer behavior investigates processes involved in the choice, acquisition, and use of goods and services. As globalization marketing recovers after the pandemic of COVID-19, the innovation brought by globalization and the resulting challenges has led businesses to try to keep up with the increasing competition in the world. Insights from consumer behavior are critical for marketers to tailor their strategies to resonate with the target audience's unique preferences and behavior. Consumer behavior is a critical and multifaceted field embedded within marketing, investigates the myriad processes involved in the choice, acquisition, use, and disposition of goods, services, concepts, or experiences by entities, be they individuals, groups, or organizations. It is anchored in disciplines such as psychology, sociology, and economics, the exploration of consumer behavior extends beyond mere consumption, enveloping a comprehensive journey that probes into the rationale, timing, location, and method of consumer interactions and decision-making within the market context. Marketers need to understand the barriers and bridges to changing consumer behavior and use relative tools to bring about a positive health orientation in society.

6. Integration of VaR with Behavioral Economics & Marketing: A New Research Dimension

The combination of VaR and behavioral economics could offer a novel method to predict market reactions and consumer behaviors. By integrating psychological factors into the VaR model, we might achieve a more nuanced understanding of market dynamics and make more correct predictions. This

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integrated approach could lead to better marketing strategies and improved decision-making processes for businesses. Theoretical constructs within consumer behavior often revolve around notions such as feeling, incentive, attitude development, data assimilation, and decision-making, each shedding light on various aspects of how consumers traverse through the marketing stimuli. For example, the Consumer Decision Model (CDM) explicates the chronological steps consumers navigate through, from need recognition, information retrieval, alternative evaluation, through to buy decisions and later post-purchase assessment, thereby providing marketers with an insight into understanding and influencing purchasing behaviors. Furthermore, the confluence of consumer behavior and marketing strategy is emphasized by the necessity to synchronize product offerings with consumer desires, predilections, and principles. The segmentation, targeting, and positioning (STP) strategy, for instance, empowers marketers to customize their offerings and communication strategies to align with specific consumer segments, thereby nurturing enhanced consumer involvement and allegiance. In a period where markets are perpetually transforming, understanding consumer behavior becomes crucial, not just to enable transactional exchanges but to set up enduring relationships between brands and consumers. Thus, the examination of consumer behavior acts as a pivotal point, allowing marketers to formulate strategies that are not only economically workable but also adhere to social and ethical standards, thereby helping the sustainable evolution of the market environment. By identifying the BE tactics in social marketing communications, the study advances previous formative research on social marketing efforts in the region of research [8].

6.1. Implications and Recommendations

While combining insights from these diverse fields promises to refine the VaR model, there are challenges to consider. The accuracy of historical data and knowledge of the psychological influences on decision-making determine how effective this integrated strategy is. To create useful models that successfully combine ideas from behavioral economics with VaR, more study is required. Make the price of a goods less unpleasant [9].

6.2. Hypothesis

Suppose that demand for a specific good. Taking example as a new released 3C product like the latest high-end version of Apple iPhone’s consumption and quantity purchased right after its release ceremony. The benefits of smartphones, such as the availability of a wide range of appealing product models, have pushed competing multinational businesses operating in this market into fierce rivalry [10].

7. Conclusion

Delve the insights from both behavioral economics and consumer behavior can potentially refine the VaR model, to a certain degree of new analyzing method. Micro applications of Value at Risk may be used in the study field's macro and micro perspectives to analyze individual and household behavior in response to governmental policymakers or sales departments of businesses.

To refine the new generated VaR model for behavioral study within the field, relative data and specific models are demanded to develop in future studies, not only for researchers and academics, but also for government’s policy decision-makers and marketing departments of firms. For governors, such methods help to predict possible models in econometric and regression ways when introducing new laws and legislations, to a certain region’s economy or a specific industry. Can the irrationality predicted by behavioral economics be quantified and incorporated into the VaR model? How might this affect future marketing decisions? An ideal point of view is, to micrify the dimension of

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traditional Value at Risk model and apply them to smaller dimensions to suit the requirements of regional or specific sample box research.

7.1. Suggest and Future Research

Suggest potential research about some functional models using methods of econometrics, to show a new method of marketing effectiveness prediction. There are significant challenges: that the subject, even though the combine subject of research, shows great reliance on historical data, where systematical errors cannot be controlled to narrow down systematic errors without audition. The development of such analyzing methods depend shows great dependence on future policy and legislations.

Suppose that quantitative analyzation models, especially those theoretical ones only appear on econometric research, can be applied to the new dimension of research mentioned above. Suppose that future-introduced fiscal and economic policies will be more reality suited, to match both national and regional realistic situations but not isolated.

Another possible method available is, to combine with future possible research applied by subjects that relates on behavioral analysis, taking example as behavioral finance. Therefore, new methods may be developed, like micrified Value at Risk model that helps to analyze microeconomic changes and responsiveness of consumers to change in a market.

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