Uncovering *implicit* consumer needs for determining *explicit* product positioning: Growing Prudential Annuities' Variable Annuity Sales

WEB APPENDIX

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A. What is a Variable Annuity (VA)?

A variable annuity is a combination of an insurance contract and an investment, under which the insurer agrees to make periodic payments to the investor, beginning either immediately or at some future date. The investor can purchase a variable annuity contract by making either a single purchase payment or a series of purchase payments.

The investment options for a variable annuity are typically mutual funds that invest in stocks, bonds, money market instruments, or some combination of the three. The value of the investments will vary depending on the performance of the investment options chosen by the investor.

Although variable annuities are typically invested in mutual funds, variable annuities differ from mutual funds in several important ways. First, variable annuities lets one receive periodic payments for the rest of one's life (or the life of the spouse or any other designated person). This feature offers protection against ***longevity risk*** – i.e. the possibility that, after one retires, he/she will outlive his/her assets. Second, variable annuities have a ***death benefit***. If one dies before the insurer has started making payments, his/her beneficiary is guaranteed to receive a specified amount – typically at least the amount of the purchase payments. The beneficiary will get a benefit from this feature if, at the time of the principal investor's death, his/her account value was less than the guaranteed amount. Third, variable annuities are ***tax-deferred***. That means no taxes on the income and investment gains from the annuity until one withdraws the money. Finally, a VA offers protection against ***sequence risk***. The invested amount bears the potential of increasing in successful markets but not decreasing below the guaranteed amount in down markets.

B. Summary of Literature Review

Understanding Emotions & Their Implications

Description	Source
Demonstrates behavioral evidence of inertia in the context of the stock market	Tykocinski, Israel and Pittman (2004)
Studies how social mood, investor's thinking and feeling drives the stock market fluctuations, by taking individual optimism and investor sentiment as specific examples of a larger social mood.	Nofsinger (2005)
Studies the influence of various reference points on regret. Do losses have a larger influence over gains?	Lin, Huang, and Zeelenberg (2006)
Educates financial practitioners about the origins of emotions that can adversely impact their performance and behavior.	Peterson (2007)
Investigates the role of emotional mechanisms in financial decision making	Lo, Repin, and Steenbarger (2005)
Generation of counterfactuals is the cognitive mechanism that engenders regret and is most likely to occur when the chosen outcome is negative and not the status quo.	Tsiros and Mittal (2000)
Article on how emotions adversely influence investments and possible remedies	Clements (2007)
Emotional state can significantly affect decision making	Elster (1998), Isen (2000), Isen, Nygren and Ashby (1988)

Behavioral Finance Theories

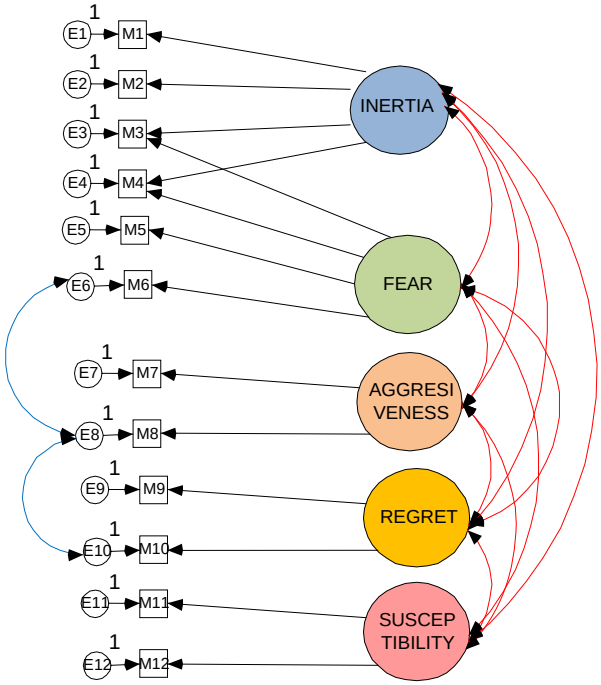
Behavioral Finance Theories		Source
Prospect Theory	People react differently to equivalent situations depending on whether it's presented as a gain or a loss. Thereby value is assigned to gains and losses rather than to final assets and probabilities are replaced by decision weights	Kahneman and Tversky (1979)
Regret Theory	People know that when they make a decision they will feel regret if they make the wrong decision. They thus take this anticipated regret into account when they decide	Bell (1982), Loomes and Sugden (1982), Shefrin and Statman (1985)
Mental Accounting	The process whereby people code, categorize and evaluate economic outcome	Thaler (1985) , Thaler and Johnson (1990)
Anchoring	Decision-making errors result from mental shortcuts that are a normal part of the way we think	Kahneman and Tversky (1973)

C. List of Measurement Items included in the Questionnaire

Emotion	Measurement item (capturing the behavioral tendency)
Fear	Invest conservatively to protect against potential losses
	Majority of the portfolio comprises of investments with greater certainty but lower rate of return
	*Hesitate to make changes to the investment portfolio
	*Non-increase of investments in the retirement portfolio in stocks or stock mutual funds
Regret	Retirement investment returns are not as per expectations
	Could have realized greater returns from retirement investments
Aggressiveness	The potential to make more money is more important than avoiding losing money
	Invest for highest returns in the RRZ despite the risk
Inertia	General tendency of postponing decisions related to managing retirement investments
	General tendency of not making any changes to the retirement investment portfolio
	*Hesitate to make changes to retirement investment portfolio
	*Non-increase of investments in retirement portfolio in stocks or stock mutual funds
Susceptibility	Importance of trusted friends' and/or relatives' advice for retirement investments
	Invest based on friends' and/or relatives' advice

* Note that there twelve distinct measurement items listed in the table above. There are two measurement items (indicated by an asterisk in the table above) that serve as an indicator for both Fear & Inertia. This is visually represented as two double-loading indicators in *Appendix-D*.

D. Measurement Model Specification



The five emotions represent latent factors with the two-headed curved arrows representing the unmeasured covariance between them. For model identification, each factor has at least two indicators (labeled M1 thru M12). While most of the indicators load on a single factor, there are two indicators (viz. *M3* and *M4)* that load on both Fear and Inertia. This is because they indicate behavioral actions that are hypothesized to be consequences of fear and/or inertia. For example, 'non-increase of investments in retirement portfolio in stocks or stock mutual funds' (measurement item *M3)* could be a consequence of *inertia* and/or *fear* of making a poor investment decision. Covariance between measurement error *E8* and measurement errors *E6* and *E10* is specified to account for method covariance. This is because *M8* and *M10* are similarly worded while *M8* and *M6* are reversely -worded measurement items. For model identification as well as defining the scale of the latent constructs, we set the factor loading corresponding to one indicator of each latent construct to be equal to '1'. From a Bayesian point of view, this is equivalent to assigning the fixed values to the corresponding parameters with a probability of one. In the analysis, regression weights corresponding to the fixed parameters are not estimated.

E. Measurement Model Results (Bayesian Estimation)

Regression weights	Posterior Mean	95% Posterior Interval	
M2<--Inertia	0.807	0.651	0.98
M3<-- Inertia	1.004	0.818	1.218
M4<-- Inertia	0.557	0.419	0.713
M3<--Fear	0.086	-0.001	0.174
M4<--Fear	0.39	0.297	0.489
M5<--Fear	0.648	0.525	0.777
M8<--Aggressiveness	0.765	0.562	0.993
M10<--Regret	1.34	1.089	1.66
M12<--Gullible	0.609	0.44	0.801

Intercepts	Posterior Mean	95% Posterior Interval	
M1	2.505	2.42	2.586
M2	2.477	2.374	2.577
M3	2.739	2.661	2.815
M4	2.308	2.23	2.386
M5	2.401	2.282	2.524
M6	2.99	2.862	3.117
M7	1.833	1.748	1.916
M8	1.519	1.434	1.604
M9	3.418	3.346	3.488
M10	2.853	2.78	2.923
M11	1.614	1.555	1.675
M12	1.577	1.532	1.621

F. Computing REQ & PIES

The REQ score (for each individual) is computed as the weighted sum of the factor scores of each respondent. To facilitate interpretation, the raw REQ scores for the representative sample of survey respondents are recalibrated in terms of a percentile score ranging from zero to hundred. By doing so, the raw REQ score for any individual respondent can be readily interpreted in terms of the relative prevalence of emotions with respect to other Americans in the RRZ. For example, a raw REQ score of '36' maps to a percentile score of '40' and may be interpreted as 40% of the US population in the RRZ having a *higher* degree of the 5 emotions as compared to an individual with REQ score of '36'. The overarching objective of this comparison is to communicate to the consumers that it is *human* to have emotions and that virtually all respondents across USA that are in the RRZ manifest some level of emotions at the time of making retirement decisions. The REQ score facilitates one to evaluate the overall prevalence of emotions vis-à-vis other individuals in the RRZ. However, it does not offer any insight in terms of which emotions are driving the REQ score? To capture this information and present it to the consumers in a meaningful way, we compute PIES as per the following formula:

$$PIES_{ij} = \frac{\sum_{k=1}^{n} w_{ijk}\,(x_{ijk} - 1)}{4\sum_{k=1}^{n} w_{ijk}} * 100$$

where n is the number of measurement items corresponding to the emotion j, w_{ijk} is the unstandardized factor loading and x_{ijk} is the Likert-scale response of investor i for measurement item k belonging to emotion j. Consequently, the computation of equation (1) will give a percentage score for each emotion ranging from 0% to 100% and can be viewed as the conditional probability of a consumer to exhibit the respective emotion in the event of making a retirement investment decision.

G. Behavioral risk implications and mitigation

No.	Emotions	Adverse Behavioral Outcome(s)	Combination of VA product features that could help mitigate behavioral risk
1.	Fear	Investors influenced by fear typically prefer certainty and aversion to losses. Their fear can preempt them from taking managed risks.	(a) Guaranteed protection of account value (b) Lock-in of market gains (c) Provide a minimum annual growth rate (d) Provide lifetime income
2.	Regret	Investors experiencing regret are typically not satisfied with past events and decisions. As a result, they may engage in risky or hasty counterfactual decisions in the future to avoid further feelings of regret.	
3.	Aggressiveness	Investors influenced by aggressiveness often engage in high-risk, high-return investment strategy. Without adequate management, aggressiveness in retirement planning can introduce unnecessary risk.	
4.	Inertia	Investor inertia is typically characterized by lack of decision-making, complacency or obsessive actions. Such investors may postpone decisions regarding retirement investments to the point where it is difficult to rectify years of ‘doing nothing’.	
5.	Susceptibility	Investors influenced by susceptibility are open to the advice of friends and relatives which may not necessarily be the best avenue for investment advice. Over-abundance of outside influence may cloud decisions or prevent the investor from seeking qualified advice when needed.	

H. Sample Testimonials from Financial Advisors and Prudential's VA distributors

"Prudential's retirement EQ tool provides a very important pause to customers. S/he becomes aware that discussions are not solely based on traditional finance models but behavioral ones as well. This is an invaluable tool for field agents as we participate in those important conversations about a customer's plans for the future."

- **Francis Marantal, Field Sales Associate.**

"The EQ tool proved successful for our agency. Our producers are looking for new, unique and user-friendly ways to help investor's understand the psychology of investing and the risks of certain behaviors to their retirement planning. This tool was a helpful and engaging way to bring the concept of behavioral finance to life."

- **Elaine Chen, Manager of Agency Training.**

Screen-shot of a Distributors' Newsletter:
It is promoting Prudential's research on Behavioral Risk to its members.

CANYON STATE CREDIT UNION

The View

January 2008

Your state, your credit union.

Are You in the Retirement Red Zone?

The Three Red Flag Risks
· Longevity
· Behavioral
· Sequence Risk

The Retirement Red Zone takes place during the five years before and five years immediately following retirement. This is a critical time when poor market performance can have a serious effect on your portfolio because time to recover is generally not on your side. The result may be a retirement that lasts

Most of us realize that in order to enjoy a comfortable retirement lifestyle, we cannot rely solely on Social Security or pensions, meaning we must consider personal investments or part-time employment.

Behavioral risk is also linked to the Retirement Red Zone. In football, emotions rise when a team approaches the goals line and threatens to score. The same holds true for consumers. Feelings such as fear, regret, apathy, and aggressiveness can cause consumers to react to market uncertainty in ways that could harm their portfolio. Because you are less likely to be swayed by emotions if you recognize that emotions can influence your decisions, simply understanding more about your decision-making can lessen the effects of behavioral risk on your portfolio.

The last associated risk known as sequence risk can occur when the market experiences a downturn around your retirement date. Let's say that you have a good plan in place, made regular contributions to your retirement plan and wisely distributed your savings. However, due to the market loss during the five years prior to retirement, your

I. Key Differences between the Standard Risk Tolerance & EQ Tool Approach

	Standard Risk Tolerance Approach	EQ Tool Approach
Objective	Evaluate the risk tolerance of an individual	Evaluate the extent to which the degree and type of emotions can impact retirement investment decisions
Outcome	Asset Allocation	Customized product positioning
Application	Reactive market orientation (i.e. responding to customer's stated needs)	Proactive market orientation (i.e. sensing and responding to customer's implicit needs)

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