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Gender Bias Influence on Financial Decision Maker's Strategies

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ABSTRACT

The paper addresses the question of the possibility of decision makers' bias in their financial decisions done on behalf of their recipient. The paper sort to document the various bias components that are largely construed to affect decision makers financial strategy. The encapsulating factors affecting financial decision makers are identified. This short and small sample paper indicates that gender bias does not influence a decision maker's financial choice strategy, but on the other hand it finds that decision makers' age has a negative and significant influence on losses strategy post - manipulation phase. The possible justification for this should be that our sample consists of youth aged between 19-26 years.

Keywords: Financial decision making, Behavioral finance, psychology, Gender bias and Choice strategy

1. INTRODUCTION

Decision making scenarios in behavioural finance have been largely discussed to be two pronged. Decision Made for Self (DMFS) or Decision Made for others or on their behalf (DMFO). There has been a growing research interest for decision making for others otherwise referred to by researchers as "surrogate decision making", "proxy choices", "paternalistic choices", "agent choices" or "social choices". (Polman & Wu, 2020). Access to credit for instance is pivotal to individual wellbeing as well as the aggregate economic development of a people however the approval or rejection largely depends on the decision makers' choice and discretions as based on the information supplied versus a credit merit or standard set by the particular institution. Critical to decision making is the rationale and emotional state of the decision maker (Juanchich et al., 2020). The dilemma of choice of how much information to collect before making a certain decision regarding a risky or uncertain choice decision is certainly always apparent. While this be the case, the lenders' interest into the amount and quality of information availed, there is a wide information cum research gap in discernment of the surrogate decision making's bias and further doubt as to whether the distinct genders making the decision have any distinguishable differences in their choices, this study is a kin to bring to the fore. This paper therefore seeks to discern more by begging the question what sentiments do decision makers hold and are they in any way influenced by

their gender identity? So far Skala and Weill, (2018) work *Does CEO gender matter in bank risk* points to the potential in this research interest, the study based in the Polish banks drew findings that banks headed by female CEO's are less risky with higher capital adequacy and equity to asset ratios. The study also noted that credit risk in female led banks was no different from the ones led by their male counterparts. Certainly, decision making may be difficult for oneself as well as for others based on the way the decision fulfils the goal of the decision maker. Batteux, Ferguson, and Tunney (2020), contend that decision making for others is amplified by the uncertainties concerning others' utilities thus adding uncertainty to the decision-making process.

Choices for decision makers have largely been rooted in the circumstances of choice under certainty, uncertainty, inter-temporal choices as well as choices in social interactions (Ifcher & Zarghamee, 2020). According to Ifcher and Zarghamee (2020) the quest to establish the applicability of the seven biases in behavioural finance remains critical; this study reveals from literature that one of the critical sentiment bias in DMFOs is largely motivated by willingness to pay in anchoring bias, endowment effect and identifiable victim bias. It is also established that decision making for others reduces loss aversion (Andersson et al., 2014). Largely, the bias in surrogate decision making have been highlighted by Tunney and Ziegler (2015), to include the intent of the decision maker, the significance or the impact of the external decision maker, accountability of the decision maker's choice, the calibration level of the psychological and construed distance and finally the empathy of the decision maker. Four main perspectives of surrogate decision makers are elaborated by Tunney and Ziegler, (2015); these perspectives include first, the perspectives of the egoistic DMFOs seeking selfish interests compared to recipient's interests, second perspective involves the benevolent decision makers who honestly seek the best interests of the recipient while the third perspective involves the simulated surrogate decision maker who attempts as much as possible to model the environment of the recipient by setting aside their selfish interests and hence seeking to accurately reflect or articulate the scenario of the recipient. The fourth perspective of the projected decision maker seeks to decide what the recipient would do or would have preferred to do if in the same position and goes ahead and does exactly that. This paper analyses the gender bias influence on financial decision maker's choice Strategy in Singapore. It finds that gender bias does not influence a decision maker's financial choice strategy, but on the other hand it finds that decision makers' age has a significant influence on losses strategy post -manipulation phase.

2. *Decision Making for Others Theoretical Underpinning*

Prospect Theory

Prospect theory proposed by Kahneman & Tversky (1979), elaborates on decision makers choices under uncertainties and risks; according to this theory decision makers prefer the choice option that maximises value rather than the maximisation of utility (Kahneman & Tversky, 1979; Wang et al., 2020). The value function being the influence of both gains and losses being considered while taking into account the decision makers risk appetites towards certain gain and losses. Decision makers largely then tend to attend more to favourable news than to additional adverse information (Ludwig et al., 2020).

Construal Level Theory

Construal Level Theory has argued that self to others differences in decision making are a result of the psychological distance from a decision as influenced by the considerations and underlying issues that people take into account in decision making (Lieberman et al., 2007; Michael et al., 2020; Trope & Liberman, 2010). Psychological distance being categorised by time and space, probability as well as social distance. Decisions under psychological distance for others are considered to be more abstract and context-independent viz a viz decisions for self that are considered with greater emphasis on context specific factors (Lieberman et al., 2007).

Screening Theory

Based on the theory of screening, Stiglitz, (1975) argued that limited or imperfect information with respect to qualities of individuals has important information in distribution income. The identification of these qualities that are generally referred to as screening relate to the attributes that label individuals in terms of their risk profiles and as such forming the attributes of credit history by lending organisations (Chatterjee & Barcun, 1970). Based on the qualitative attributes adopted in screening, information offered or recorded of an individual can lead to an individual obtaining a loan facility or based on similar information having a rejection as a result of the labelling effect.

Credit screening and credit scoring quantifies the credit risk of various agents/individuals using various assessments techniques and indices, largely credit scores are earned and based on a scenario of low credit scores indicates a risk of credit fraud (Yu et al., 2015). The various assessment techniques identified adopted to aid decision making including expert system, which is subjective in nature; econometric approach that largely works with modelling of scenarios though discriminant analysis, logit/probit models and cluster analysis; other techniques include mathematical programming and artificial intelligence are applied. The rationale behind screening theory is here theorised on the view that a decision maker's choice of a particular technique or a choice of techniques is largely to promote a more grounded basis for certainty in the decision choices adopted with the view that decisions are not simply justified by the emotion and whims of the decision makers' sentiment analysis but technical analysis plays a pivotal role. Deng et al., (2011) justify the adoption of the two methods sequentially by first reviewing the technical analysis followed the sentimental analysis.

3. *Perceived Sentiments Moderators for DMFOs*

Decision making is well articulated under the confines of perceived sentiment that tend to moderate the decision taken. Batteux et al., (2019), identified the key decision moderators that come into play in DMFOs namely the Frame, Recipient, Domain and Accountability. Their elaboration is below highlighted.

Decision Framing

Framing effects occur to DMFOs when the decisions that make people change are as a result to which the various outcomes have been described to the participants, typically a framing effect is presented as an aversion to risk when the chances are revealed as gains, and preferences for gain when presented as losses (Tversky & Kahneman, 1981; Ziegler & Tunney, 2015). Framing and reframing confirms the importance of framing in decision-making in general (Ifcher & Zarghamee, 2020).

Recipient

The identity of the recipient to the surrogate decision maker as well as the psychological distance and emotional empathy are prone to influence the decision making process. It would be largely predicated that surrogate decision making would be more pronounced when the recipient is a stranger compared to a close recipient such as a friend or a family relations. Polman and Wu, (2020) identified that largely decisions for others would be riskier and more cautious with the factors for decision framing and recipients identity in mind. This study largely explore the gender perspective of the decision maker and the effect on loss or gain choices.

Domain

It is expected that surrogate decision makers would make risky decision choices in interpersonal relations compared to less risky decisions in the medical domain. In a study by Batteux et al., (2020) it emerged that decisions made by surrogates on financial decisions do not compute the recipients' utilities when making a decision on their behalf or may not rely on it heavily. In severe medical conditions surrogate decision makers generally elicit a more calculated and cautious approach.

Accountability

Losecaat Vermeer et al. (2020) identified that accountability in either outcome accountability or full accountability. In particular circumstances, the need to justify a certain process may be evaluated based on the possible outcomes where both the process and outcome were elaborated to the recipient had a significant though reduced effect. Surrogate decision making has generally been identified to influence risk taking behaviour for choices in various circumstances and domains. Being accountable for the process when deciding for the other has partly demonstrated reduced risk taking for some investments. Largely then, risk taking ventures on behalf of others is significantly impacted by the decision process that the surrogate decision maker is held for.

How Gender bias decision making

With the note that surrogate decision making is affected by the decision frame, accountability, domain and identity of the recipient. This study ported to model the role of the surrogate decision maker with a gender bias. Given the above stated factors would there be a significant or insignificant effect between genders? Literature in managerial characteristics has cited the importance of individual and emotional bias (Bacha & Azouzi, 2019)

4. Data and Method

This study adopts dataset (<https://doi.org/10.6084/m9.figshare.1476262.v1>) by Mullette-Gillman et al., (2015) that largely assessed how cognitive fatigue destabilizes economic decision making preferences and decision making. The dataset was adopted in view of testing the gender bias influence on decision maker's choice strategy. The decision maker's choice strategy has four components such as gains strategy pre-manipulation phase, losses strategy pre-manipulation phase, gains strategy post-manipulation phase and losses strategy post -manipulation phase. The focus of this empirical assessment is to investigate the gender bias influence on decision maker's choice strategy. The explanatory variable of primary concern being gender defined with male and female if 1 and 0 respectively. The explained variable is maximising choice strategy¹ on gains and losses. The descriptive characteristics of the main variables are presented in Table 1. Largely, the data has 72 respondents. 43 % of the respondents are female between the ages of 19 and 26. The variables used in this short paper are well explained in Table 1 named descriptive statistics.

In order to analyse the gender bias influence on decision maker's choice strategy, we adopt the following equation: $Choice\ Strategy = \alpha + \beta\ Gender + \gamma\ \square\square\ Control\ Variables + \epsilon$

5. Results: Main Estimations

This section presents the results for gender and decision-making choice strategies as presented in Table1, Table2, Table3, Table4 and Table 5. In the main estimation we observe that gender is not statistically significant, but on the other hand, decision makers' age has a negative and significant influence on losses strategy post -manipulation phase. However, decision framing effect is presented as significant as an aversion to risk when the chances are revealed as gains, and preferences for gain when presented as losses. Further, with the discussion of the possible outcomes the data revealed a significant effect on the age where the possible justification for this should be that our sample consists of youth aged between 19-26 years.

¹ In Mullette-Gillman et al's (2015) study where this dataset is obtained the maximising strategy aimed at computing the expected value of the gamble (rEV) or by winning a gamble (pWIN).

Table 1: Descriptive Statistics

VARIABLES	(1) mean	(2) sd	(3) p25	(4) median	(5) p75	(6) min	(7) max	(8) N
Age	22.29	1.732	21	21	23	19	26	72
Gender (1-male, 0-female)	0.542	0.502	0	0	1	0	1	72
Gains_Ambig_premium_pre	1.482	1.216	0.625	0.625	2.500	-0.250	4.500	43
Gains_Ambig_premium_post	1.011	1.159	-0.0833	-0.0833	1.833	-0.313	3.500	43
Losses_Ambig_premium_pre	0.0108	0.419	-0.313	-0.313	0.150	-0.388	1.500	65
Losses_Ambig_premium_post	0.0726	0.561	-0.250	-0.250	0.150	-0.450	2.500	65
Gains_risk_premium_post	14.39	13.41	1	1	26	1	41	72
Gains_Strategy_post	33.58	20.79	15.50	15.50	51.50	1	69	72
Gains_Strategy_pre	35.43	20.77	17.50	17.50	53.50	1	70	72
Losses_Strategy_post	35.51	20.90	17.50	17.50	53.50	1	71	72
Losses_Strategy_pre	36.50	20.93	18.50	18.50	54.50	1	72	72
Losses_risk_premium_post	20.19	11.68	9.500	9.500	28.50	1	42	72
Losses_risk_premium_pre	23.26	15.61	9	9	36	1	52	72

Table 1 shows the descriptive statistics concerning all variables used in the analysis where gender is the main explanatory variable, gains strategy pre-manipulation phase, losses strategy pre-manipulation phase, gains strategy post-manipulation phase and losses strategy post-manipulation phase are the independent variables of the research. And then gains pre-manipulation phase and losses post-manipulation phase are control variables. The control variables are age, gains risk premium post manipulation phase, losses risk premium pre manipulation phase, losses risk premium post manipulation phase, gains ambiguity premium pre manipulation phase, gains ambiguity premium post manipulation phase, losses ambiguity premium pre manipulation phase, losses ambiguity premium post manipulation phase, gains risk premium post manipulation phase. Mullette-Gillman et al., (201) define pre-manipulation phase the time all participants completed the two computerized economic decision-making tasks. The manipulation phase followed, with differential treatments for the participants in the fatigue and control conditions. While post-manipulation phase, participants completed the self-reported cognitive fatigue question and Rating Scale Mental Effort. Participants then repeated the two computerized economic decision making tasks. The two financial decision making tasks are one for gains and one for losses. The economic decision making task comprised of gains and losses domains, whereby participants were required to choose between a certain or gamble option. They were given no time limit to respond. Participants were paid based on random selection and resolution of one trial from each domain after the completion of the entire experiment.

Table 2: Gender and decision strategy without ambiguity variables

VARIABLES	(1) Losses_Strategy_pre	(2) Losses_Strategy_post	(3) Gains_Strategy_pre
Gender (1-male, 0-female)	-0.0376 (-0.00792)	-1.207 (-0.254)	5.180 (1.036)
Losses_risk_premium_pre	0.353* (1.951)	0.481** (2.649)	0.287 (1.507)
Losses_risk_premium_post	-0.165 (-0.680)	0.141 (0.581)	-0.245 (-0.959)
Gains_risk_premium_post	0.602*** (3.399)	0.248 (1.398)	0.309 (1.655)
Constant	22.97*** (4.118)	18.56*** (3.318)	26.44*** (4.501)
Observations	72	72	72
R-squared	0.206	0.200	0.106

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2 shows regression of gender on other variables of the study, but excluding ambiguity variables. The result in this table indicates that gender does not influence a decision maker's choice strategy.

Where, gains_Strategy_pre, gains_Strategy_post, losses_Strategy_pre, losses_Strategy_post, are defined as gains strategy pre-manipulation phase, losses strategy pre-manipulation phase, gains strategy post-manipulation phase and losses strategy post-manipulation phase. And then, Losses_risk_premium_pre, Losses_risk_premium_post, Gains_risk_premium_post are defined as losses risk premium pre manipulation phase, losses risk premium post manipulation phase, gains risk premium post manipulation phase, gains ambiguity premium pre manipulation phase, gains ambiguity premium post manipulation phase, losses ambiguity premium pre manipulation phase, losses ambiguity premium post manipulation phase, gains risk premium post manipulation phase.

Table 3: Age and decision strategy without ambiguity variables

VARIABLES	(1) Losses_Strategy_pre	(2) Losses_Strategy_post	(3) Gains_Strategy_pre	(4) Gains_Strategy_post
Age	-0.941 (-0.711)	-1.382 (-1.045)	-1.356 (-0.967)	-3.981* (-1.848)
Losses_risk_premium_pre	0.345* (1.918)	0.465** (2.587)	0.294 (1.542)	0.347 (1.394)
Losses_risk_premium_post	-0.173 (-0.720)	0.135 (0.563)	-0.284 (-1.116)	0.122 (0.395)
Gains_risk_premium_post	0.594*** (3.497)	0.225 (1.327)	0.351* (1.952)	-0.0792 (-0.259)
Constant	44.39 (1.451)	49.52 (1.620)	59.50* (1.837)	115.4** (2.409)
Observations	72	72	72	43
R-squared	0.212	0.212	0.104	0.180

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3 shows regression of age on other variables of the study. The result in this table indicates that age has a negative and significant influence on losses strategy post manipulation phase. Where, gains_Strategy_pre, gains_Strategy_post, losses_Strategy_pre, losses_Strategy_post, are defined as gains strategy pre-manipulation phase, losses strategy pre-manipulation phase, gains strategy post-manipulation phase and losses strategy post -manipulation phase. And then, Losses_risk_premium_pre, Losses_risk_premium_post, Gains_risk_premium_post, are defined as losses risk premium pre manipulation phase, losses risk premium post manipulation phase, gains risk premium post manipulation phase, gains ambiguity premium pre manipulation phase, gains ambiguity premium post manipulation phase, losses ambiguity premium pre manipulation phase, losses ambiguity premium post manipulation phase, gains risk premium post manipulation phase.

Table 4: Gender and Decision Strategy by controlling ambiguity variables

VARIABLES	(1) Losses_Strategy_ pre	(2) Losses_Strategy_p ost	(3) Gains_Strategy_ pre	(4) Gains_Strategy_p ost
Gender (1-male, 0-female)	1.639 (0.202)	-2.581 (-0.373)	3.818 (0.529)	-0.573 (-0.0709)
Losses_risk_premium_pre	0.0366 (0.117)	0.0367 (0.137)	0.106 (0.380)	0.541* (1.733)
Losses_risk_premium_post	-0.286 (-0.694)	0.555 (1.581)	-0.309 (-0.846)	-0.0559 (-0.136)
Losses_Ambig_premium_pre	0.0905 (0.00908)	18.05** (2.121)	-0.243 (-0.0274)	-10.90 (-1.099)
Losses_Ambig_premium_post	-1.733 (-0.233)	-9.298 (-1.464)	5.551 (0.839)	12.62* (1.705)
Gains_risk_premium_post	0.597* (1.710)	0.166 (0.558)	0.727** (2.341)	0.110 (0.317)
Gains_Ambig_premium_pre	-3.260 (-0.810)	-6.639* (-1.932)	-5.380 (-1.503)	0.785 (0.196)
Gains_Ambig_premium_post	2.523 (0.609)	1.686 (0.477)	0.629 (0.171)	-5.496 (-1.332)
Constant	35.79*** (3.234)	33.06*** (3.499)	38.20*** (3.881)	25.06** (2.275)
Observations	37	37	37	37
R-squared	0.145	0.353	0.254	0.250

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4 shows regression of gender on other variables of the study. The result in this table indicates that gender bias does not influence a decision maker's choice strategy. Where gains_Strategy_pre, gains_Strategy_post, losses_Strategy_pre, losses_Strategy_post, are defined as gains strategy pre-manipulation phase, losses strategy pre-manipulation phase, gains strategy post-manipulation phase and losses strategy post -manipulation phase. And then, Losses_risk_premium_pre, Losses_risk_premium_post, Losses_Ambig_premium_pre, Losses_Ambig_premium_post, Gains_risk_premium_post, Gains_Ambig_premium_pre, Gains_Ambig_premium_post are defined as losses risk premium pre manipulation phase, losses risk premium post manipulation phase, gains risk premium post manipulation phase, gains ambiguity premium pre manipulation phase, gains

ambiguity premium post manipulation phase, losses ambiguity premium pre manipulation phase, losses ambiguity premium post manipulation phase, gains risk premium post manipulation phase.

Table 5: Age and decision strategy by controlling ambiguity variables

VARIABLES	(1) Losses_Strategy_pre	(2) Losses_Strategy_post	(3) Gains_Strategy_pre	(4) Gains_Strategy_post
Age	-0.379 (-0.167)	-3.342* (-1.818)	1.928 (0.919)	-2.782 (-1.325)
Losses_risk_premium_pre	0.0444 (0.142)	0.0405 (0.160)	0.0999 (0.367)	0.531* (1.954)
Losses_risk_premium_post	-0.295 (-0.725)	0.627* (1.907)	-0.338 (-0.868)	-0.150 (-0.386)
Losses_Ambig_premium_pre	0.355 (0.0359)	17.67** (2.209)	-1.030 (-0.109)	-17.30* (-1.838)
Losses_Ambig_premium_post	-1.649 (-0.222)	-9.536 (-1.587)	6.928 (1.025)	16.23** (2.401)
Gains_risk_premium_post	0.600* (1.723)	0.0371 (0.131)	0.658* (2.054)	-0.166 (-0.518)
Gains_Ambig_premium_pre	-2.964 (-0.747)	-5.985* (-1.863)	-4.205 (-1.149)	4.639 (1.267)
Gains_Ambig_premium_post	2.325 (0.581)	2.220 (0.685)	-0.723 (-0.206)	-6.484* (-1.843)
Constant	44.67 (0.893)	103.9** (2.566)	-13.27 (-0.274)	65.46 (1.353)
Observations	37	37	37	37
R-squared	0.144	0.419	0.338	0.468

t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5 shows regression of age on other variables of the study. The result in this table indicates that age has a negative and significant influence on losses strategy post manipulation phase. Where, gains_Strategy_pre, gains_Strategy_post, losses_Strategy_pre, losses_Strategy_post, are defined as gains strategy pre-manipulation phase, losses strategy pre-manipulation phase, gains strategy post-manipulation phase and losses strategy post-manipulation phase. And then, Losses_risk_premium_pre, Losses_risk_premium_post, Losses_Ambig_premium_pre, Losses_Ambig_premium_post, Gains_risk_premium_post, Gains_Ambig_premium_pre, Gains_Ambig_premium_post are defined as losses risk premium pre manipulation phase, losses risk premium post manipulation phase, gains risk premium post manipulation phase, gains ambiguity premium pre manipulation phase, gains ambiguity premium post manipulation phase, losses ambiguity premium pre manipulation phase, losses ambiguity premium post manipulation phase, gains risk premium post manipulation phase.

Conclusions

Decision making for others has presented a stronger desire to understand the factors affecting the choices arrived at by these decision makers. It is emergent that the decision makers' age creates a trend towards increasing or lessening the risk behaviour, this is further compounded by the domain to which the decision is made. It is much pronounced in the decision making that age may have influence on financial decision strategy. The possible influence on gender was not however justified partly due to the original research design presented in the simulated data used. Further, with the discussion of the possible outcomes, as the data analysis revealed a significant effect on the age, where the possible justification for this should be that our sample consists of youth aged between 19-26 years. Briefly, the sample size used in this study is small, but as I am really interested in this behavioural finance topic, I would like to see how the preliminary result should look like. The result looks interesting, unfortunately as I do not have enough time to run some statistical tests.

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Dataset

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