

# S(k)in in the game: Investing Responsibly in the Face of Risk

Luc Meunier<sup>1</sup>, Safaa Adil<sup>1</sup>, and Marjorie Tendero<sup>1\*</sup>

<sup>1</sup>ESSCA School of Management

\* SMART LERECO

**Corresponding author:** Luc Meunier, luc.meunier@essca.fr

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## Abstract

**In this paper, we examine the effect of the model's presence and perceived risk on investors choice considering their ethical mindsets: Would model gender and risk influence investment in socially responsible funds? We conducted a choice-based experiment in which participants were invited to allocate their portfolio across three investments: a socially responsible fund, a sin fund or a safe account. The risk of the SRI and sin fund was manipulated across treatment (high or low), as well as the presence of a model face (woman, man or without). We find that SRI choice was positively influenced by the presence of a masculine face. A higher level of risk of the sin fund relative to the SRI one favors greater investment in SRI. On the opposite, a higher level of risk of the SRI relative to the sin fund reduces investment in SRI, apart for highly ethically-minded consumers, who invest in SRI and shun sin stock without consideration for risk.**

## 1. Introduction

Socially responsible investments (SRI) have become increasingly popular these last years amongst institutional investors. SRI now amounts to \$35.3 trillions globally, an amount which represent over a third of all professionally managed assets (GSIA, 2020). However, retail investors lag. While they are 52 to 80% to express their willingness to hold at least a part of their portfolio in SRI, they are only around 5% to do so (see BNP Paribas 2018 survey over 5,000 retail investors from various European countries: Italy, France, Belgium, Germany and the Netherlands). There is thus a need to understand the drivers of investment in SRI for retail investors (Capelle-Blancard and Monjon, 2012, Riedl and Smeets, 2017). However, little is known about the effect of investor/fund ethical congruence and gender congruence. We consider the potential nudge of fund ethical positioning, its risk level and the human figure used to promote it. We investigate this issue along three lines.

A first dimension of interest is the ethical character of SRI. SRI funds select their products not only based on the risk-return trade-off, but also on Environmental, Social and Governance criteria, giving, for example, the reassurance that investments exclude companies in the tobacco, weapons, or gambling industries. On the opposite, some funds called “sin funds” invest exclusively in these industries. While behavioral research on SRI is flourishing, research on sin investing is limited (Salaber, 2007).

Second, studies have traditionally investigated willingness-to-pay in SRI investing by varying the expected return of the SRI funds (Apostolakis *et al.*, 2018, Brodback *et al.*, 2019), showing that investors are on average willing to pay a premium to invest in an SRI fund. However, the risk level of the fund should theoretically have an impact as well.

Third, presentation surrounding the funds matters, and can act as a priming nudge. It is well established that face presence (versus no presence) in ad influences positively costumers' cognitive responses (Sajjacholapunt and Ball, 2014, Sato and Kawahara, 2015). Furthermore, some studies

revealed a stereotype effect of ad model's gender on observer's responses (Knoll *et al.*, 2011; Åkestam *et al.*, 2017). According to Niessen-Ruenzi & Ruenzi (2018), investors may prefer male fund managers to female ones because of gender stereotypes bias.

Our paper unfolds as follow. We first depict the methods used, before moving on to univariate results. Multivariate results from our regressions are then presented, before concluding and presenting paths for future research.

## 2. Materials and Methods

### *Participants*

446 adults (55% men) aged 16 to 61 years ( $M=21.73$ ,  $SD=7.05$ ) were surveyed between October and November 2020. The participants were recruited from a business school initial and lifelong learning programs (79% enrolled in the 5-years Master program of the school)<sup>1</sup>.

### *Experimental design*

We designed a between subject design 3 (Face) x 2 (Risk of SRI) x 2 (Risk of sin) experiment. We customized the test header to manipulate face presence (see figure 1): woman face, man face, and no face conditions. We used two models (young Caucasian man/woman), unknown, to avoid celebrity endorsement effect. Facial expressions (positive) and head orientation were identical. We defined two conditions for the risk of each fund: high (6) and low (3) (on a scale rated from 1 extremely low to 7 extremely high). In total, 12 versions of the survey were generated, randomizing the 12 different conditions of the manipulated independent variables. Respondents were asked to evaluate their feelings regarding the model on a likert scale from 1 to 5. We used in the analysis the extent to which respondents felt the model was "considerate".

### *Procedure*

The participants were exposed to an investment game scenario (see figure 2, inspired from Gajewski *et al.*, 2021) with a header showing one of the three conditions for face presence. The main task of this experiment was to allocate \$10.000 between three investment vehicles: an SRI fund, a sin fund, and a safe account. The risk and expected return of each fund were rated from 1 to 7, as in the real world.

Based on Riedl and Smeets (2017), we tested different control variables which could influence SRI investment decision: 1) We measure risk preferences, based on a modified version (Desmoulin-Lebeault *et al.*, 2018) of the Eckel and Grossman (2008) risk preferences task, 2) cognitive reflection score (Frederick, 2005), 3) financial literacy level (Lusardi and Mitchell, 2008), 4) Altruism scale (Goldberg *et al.*, 2006), and 5) Ethically Minded Consumer Behavior scale (EMCB, Sudbury-Riley and Kohlbacher, 2016). We display in Table 1 below descriptive statistics regarding our variable, alongside a short description of them.

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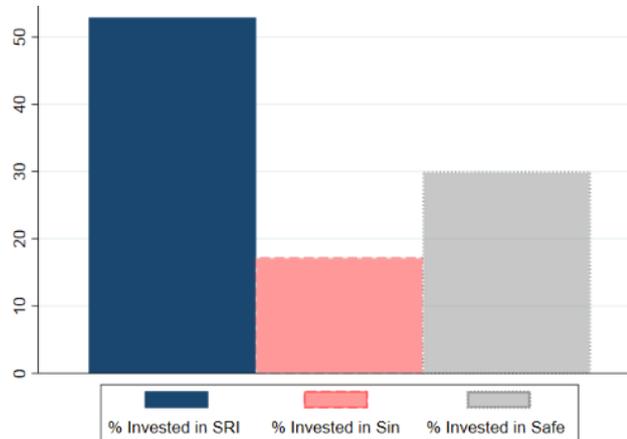
<sup>1</sup> While our sample is essentially composed of students, recent evidence tends to underline that they are a reasonable proxy for (even professional) investors (see Gajewski and Meunier, 2020).

<b>Variable</b>	<b>Description</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Min</b>	<b>Max</b>
<b>Model Woman</b>	Dummy equal to 1 if the respondents saw the female model.	0.341	0.475	0	1
<b>Women</b>	Dummy equal to 1 if the respondents is a woman.	0.448	0.498	0	1
<b>Model Man</b>	Dummy equal to 1 if the respondents saw the male model.	0.314	0.465	0	1
<b>High Risk (HR) Both</b>	Dummy equal to 1 if both investments were high risk.	0.253	0.435	0	1
<b>High Risk (HR) SRI</b>	Dummy equal to 1 if only the SRI investments was high risk.	0.231	0.422	0	1
<b>High Risk Sin</b>	Dummy equal to 1 if only the Sin investments was high risk.	0.233	0.423	0	1
<b>Scale EMCB</b>	Ethically Minded Consumer Behavior scale (EMCB, Sudbury-Riley and Kohlbacher, 2016).	35.422	7.338	11	50
<b>Risk Tolerance</b>	Risk preferences, based on a modified version (Desmoulins-Lebeault <i>et al.</i> , 2018) of the Eckel and Grossman (2008)	2.453	1.394	1	5
<b>CRT</b>	Number of correct answers to the Cognitive reflection score (Frederick, 2005), out of 3 questions.	1.639	1.150	0	3
<b>Altruism</b>	Altruism scale (Goldberg <i>et al.</i> , 2006)	9.475	5.311	-9	20
<b>Financial Literacy</b>	Number of correct answers to the Financial literacy test of Lusardi and Mitchell, 2008, out of 3 questions.	1.087	0.764	0	3
<b>Age</b>	Age of the participant.	21.740	7.065	16	61
<b>Ever Invested</b>	Dummy equal to 1 if individual has invested on the financial market (currently or in the past)	1.729	0.445	1	2
<b>Currently Working</b>	Dummy equal to 1 if currently employed	0.253	0.435	0	1
<b>Master Program</b>	Dummy equal to 1 if enrolled in the Master Program	0.794	0.405	0	1
<b>Considerate</b>	Likert scale – “I found the model presented to me to be considerate.”	3.410	0.877	1	5

**Table 1 - Descriptive Statistics**

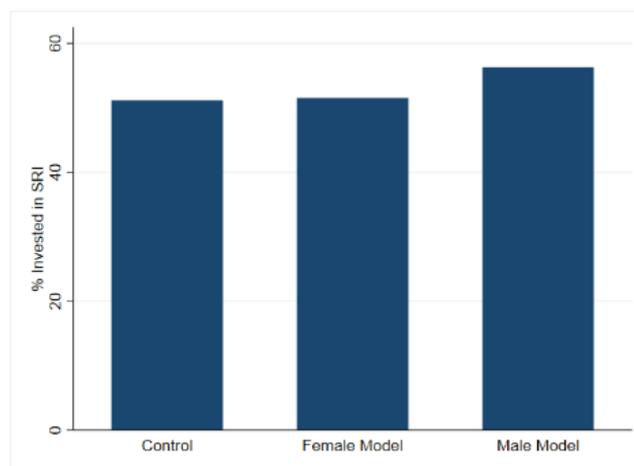
### 3. Results

**The SRI Fund** - Across all treatments, respondents allocated 53% of their investment to the SRI fund, 17% to the sin fund, and 30% to the safe account. We thus already observe a deviation from the classic 1/n allocation, indicating a clear preference for SRI over the sin fund ( $p < 0.01$ , Figure 3).



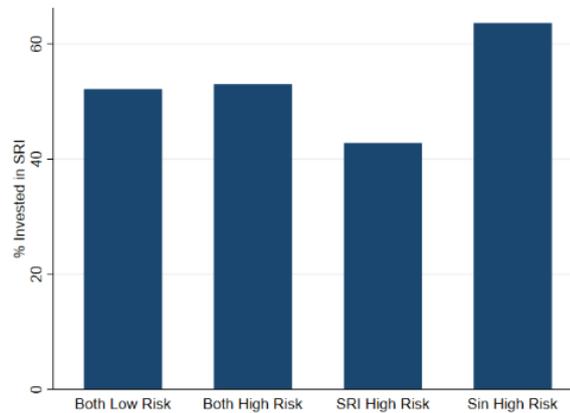
**Figure 3- Average allocation across all treatments**

**Face: Gender Effect** - Simple T-test underlines that respondents being confronted with the male model invest significantly more in SRI than the control group seeing no model or to the group seeing a female model (marginal significance,  $p < 10\%$  in both cases, Figure 4). Women who have seen a male model invest significantly more in SRI than women having seen a female model ( $p < 5\%$ , simple t-test). The male model indeed appeared more considerate, to the female part of our sample ( $p < 10\%$  for the whole sample,  $p < 10\%$  for the women-only sample, non-significant in the men-only sample).



**Figure 4 - Effect of the face**

**Risk effect** – It is likely that relative risk - the risk of the SRI fund relative to the one of the sin funds – is the one that matters to participants, as opposed to the level of risk of each fund in absolute term. We analyse the results in that direction. As highlighted in Figure 5, when both funds are low or high risk, we do not observe any change. However, the SRI Fund being high risk leads to significantly lower ( $p < 1\%$ , t-test) investment in SRI compared to control, while the sin fund being high risk leads to significantly higher investment in SRI ( $p < 1\%$ , t-test, Figure 5).



**Figure 5 – Effect of the various risk treatments**

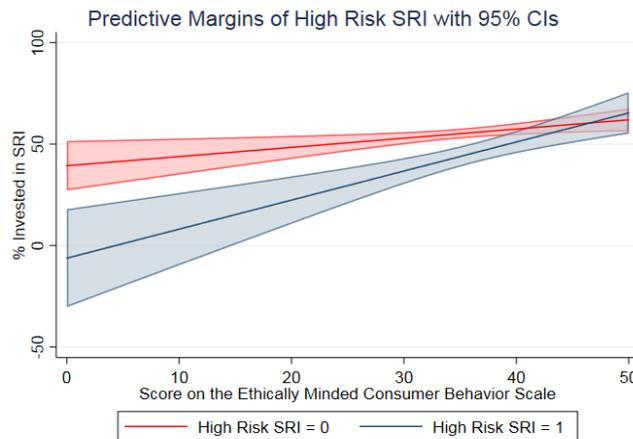
**Regressions**

**Face: Gender effect** - Performing regressions (Table 1), we observe in the first regression a significant positive effect of male model on SRI investing ( $p < 10\%$ ). This effect turns non-significant ( $p = 10.4\%$ ) once we include how considerate the human model was perceived (regression 2). Perceiving the model as more considerate increase investment in SRI ( $p < 10\%$  in regression 2,  $p < 5\%$  in the third). We introduce interaction in regression 3. We observe that women who have seen the female model invest less in SRI, compared to seeing no face or the male model (marginal significance,  $p < 10\%$ ). The addition of this interaction enables to highlight that women who do not see the female model (and thus see either no face or the male model) invest more in SRI than their men counterparts ( $p < 10\%$ ).

**Risk Effect and interaction with EMCB** - Respondents who were exposed to a condition with a higher risk SRI fund invested less in SRI (around 11%,  $p < 1\%$ , see regression 1 and 2), while those who were exposed to a higher risk sin fund invested more in SRI (around 12%,  $p < 1\%$ ).

Older respondents and respondents engaged in the 5-years program of the school invested more in SRI, across all regression models ( $p < 1\%$ ). Those scoring higher on the financial literacy scale ( $p < 5\%$ ) and those scoring higher on the EMCB scale ( $p < 1\%$ ) also invest more in SRI, across all models.

In regression 3, we observe a significant interaction between seeing the risky SRI funds and score on the EMCB scale. This interaction shows that non-ethically minded respondents reduce their investment in the SRI fund when this one displays a worse risk-return profile. These respondents prefer a socially responsible investment but are willing to swap it for a better risk-return profile. On the opposite, ethically minded respondents will allocate a similar portion of their portfolio to the SRI fund, even when this fund displays a worse risk-return profile ( $p < 1\%$ , Figure 6). Thus, strongly ethically minded respondents maintain their level of investment in SRI, independently of the excess return they could earn by switching to the sin fund. One could say that their engagement in favor of ethics is “not for sale.”

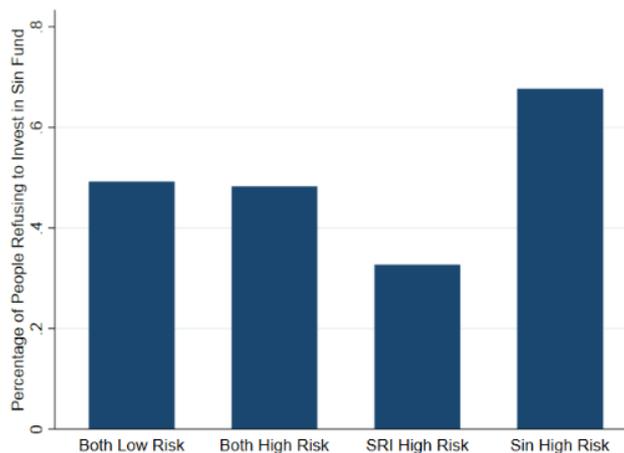


**Figure 6 - Effect of EMCB Score on SRI Investment**

**The Sin Fund**

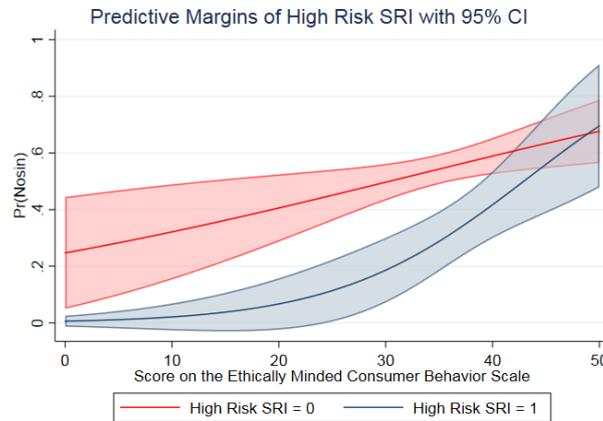
Interestingly, a significant proportion (49.5% across all treatments) of participants refused to invest in the sin fund. Female participants, older participants, participants engaged in the 5-years program of the school were more likely to refuse to invest in the sin fund. Participants scoring higher on the CRT test or the EMCB and preferring lower risk lotteries were more likely to refuse to invest in the sin fund (see Table 2 for a logistic regression).

Such a zero investment in the sin funds could be interpreted as a complete rejection of the industries supported by this investment vehicle. However, here, we see again an effect of risk: participants being confronted with a high-risk SRI fund treatment were less likely to refuse to invest in the sin fund. On the opposite, participants confronted with the high-risk sin funds were more likely to refuse to invest in it (Figure 7). It thus again seems that moral values are, for most, malleable in the face of higher financial risk.



**Figure 7 - Percentage of Respondents Refusing to Invest in the Sin Fund**

However, we again observe an interaction between scores on the EMCB scale and a higher risk for the SRI funds. For strongly ethically minded consumers, there is again no impact of the risk of the SRI funds on their decision to boycott the sin fund (Figure 8).



**Figure 8 - Effect of EMCB Score on SRI Investment**

#### 4. Discussion

This study shows that participants exposed to a male model or to a low-risk SRI fund compared to the sin one invested more in SRI. It was previously demonstrated that the use of feminine or masculine figures in ads activates certain mental schemes in consumer’s mind (Åkestam *et al.*, 2017). We found that male figures induced higher investment in SRI. Our results corroborated Niessen-Ruenzi and Ruenzi (2018) gender stereotype effect in an SRI investment context.

We also found that a high EMCB score influence positively the investment in the SRI fund in particular when its risk is high relative to the sin fund. This result is in adequation with previous studies findings that social value orientations impact responsible behavior, independent of the personal costs (Cameron *et al.*, 1998). Our results also corroborate previous studies showing a higher responsible purchasing intention among highly educated individuals and women (Nilsson, 2008).

We explored the effect of human presence and risk on SRI. Future researches may further considerate the gender congruence between the model and the observer, potentially using eye-tracking measures to assess which stimuli catches more visual attention and may nudge investors toward SRI. International studies, enabling for cross cultural comparisons, would also prove a promising avenue for future research.

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## Appendix

**Figure 1 - Illustrative example of headers in the “Woman condition”, “Man condition” and “No-Face Condition”**



**Figure 2 – Illustrative example of the main task instructions**

**Investment Game**

Imagine that you have **10,000\$** to invest.

You have narrowed down your choice to the two investments funds below. One is a so-called “Sin Fund”, investing in industries such as tobacco, alcohol, adult entertainment, firearms or gambling, without taking into account moral considerations.

The other is a **Socially Responsible Fund**, investing only in green and socially responsible companies.

In addition to investing in these two funds, you can still choose to leave a part of your 10,000\$ on a **Safe Account**, where they will be safe but won't earn you any profit.

Your task is to choose the percentage you would allocate to each of these 3 options by clicking and dragging the bars below the description. The total percentage needs to equal 100%.

For each fund, a **risk index** on a scale of 1 to 7 is indicated, 1 is the least risky, and 7 the riskiest. Similarly, a **financial return index** on a scale of 1 to 7 is indicated, with 1 being the lowest return and 7 being the highest return.

Investment	Risk	Return
Sin Fund	3	3
Socially Responsible Fund	3	3
Safe Account	0	0

**Table 2 - OLS: Percentage invested in SRI**

	Regression 1 - OLS		Regression 2 - OLS		Regression 3 - OLS	
	Coef.	P> t	Coef.	P> t	Coef.	P> t
Model Woman	0.124	0.962	0.075	0.977	3.727	0.252
Women	1.122	0.636	1.394	0.557	4.759*	0.093
ModWoman#Women					-8.563*	0.054
Model Man	4.699*	0.072	4.256	0.104	3.568	0.170
High Risk (HR) Both	-1.218	0.676	-1.481	0.611	-1.553	0.591
High Risk (HR) SRI	-10.016***	0.001	-10.245***	0.001	-45.524***	0.001
Scale EMCB	0.671***	0.001	0.665***	0.001	0.453***	0.009
HR SRI#ScaleEMCB					0.978***	0.008
High Risk Sin	11.489***	0.001	11.262***	0.001	11.527***	0.001
Risk Tolerance	0.066	0.934	0.129	0.871	0.065	0.934
CRT	-0.382	0.694	-0.369	0.703	-0.514	0.592
Altruism	-0.009	0.966	-0.025	0.908	-0.103	0.631
Financial Literacy	3.170**	0.035	3.049**	0.043	3.142**	0.035
Age	0.531***	0.008	0.540***	0.007	0.530***	0.007
Ever Invested	0.595	0.813	0.431	0.864	0.355	0.887
Currently Working	3.700	0.205	3.820	0.190	4.472	0.123
Master Program	8.697***	0.007	8.690***	0.007	8.262***	0.010
Considerate			2.130*	0.079	2.673**	0.028
Constant	3.889	0.677	-2.768	0.783	3.176	0.761
N	446		446		446	
R <sup>2</sup>	0.184		0.190		0.210	
AIC	4045.29		4044.08		4036.91	
BIC	4110.89		4113.79		4114.82	

We checked for VIF, heteroscedasticity and non-normality of residuals for all regressions and did not find any point of concern. Regarding variable coding, CRT and Financial literacy are scores ranging from 0 to 3 to the respective standard test. For EMBC and altruism constructs we computed a general score adding their scales' items. Risk Tolerance range from 1 to 5, and represents the lottery chosen by participants, 5 being the highest risk lottery. High Risk (HR) Both, High Risk (HR) SRI, High-Risk Sin are three dummy variables representing our experimental treatments regarding risk (base category being thus low risk both). Similarly, Model Woman and Model Man are dummies coding for respondents having seen these models (base category being thus no human model).\*,\*\* and \*\*\* respectively indicate  $p < 10\%$ ,  $p < 5\%$  and  $p < 1\%$ .

**Table 3 - Logistic Regression: Refusing to Invest in the sin Fund**

	Logistic Regression		AME	
	Coef.	P> z	dy/dx	P> z
Model Woman	-0.263	0.312	-0.066	0.310
Women	0.509**	0.033	0.126**	0.031
Model Man	-0.049	0.852	-0.012	0.852
High Risk (HR) Both	-0.293	0.300	-0.073	0.297
High Risk (HR) SRI	-4.382**	0.014		
Scale EMCB	0.042**	0.015		
HR SRI#c.ScaleEnv	0.090*	0.053		
High Risk Sin	0.839***	0.005	0.205***	0.003
Risk Tolerance	-0.145*	0.069	-0.036*	0.069
CRT	0.174*	0.080	0.044	0.080
Altruism	-0.025	0.262	-0.006	0.262
Financial Literacy	0.001	0.993	0.000	0.993
Age	0.102***	0.001	0.025***	0.000
Ever Invested	0.283	0.276	0.071	0.273
Currently Working	0.376	0.202	0.094	0.198
Master Program	0.664*	0.055	0.163**	0.046
Considerate	0.161	0.187	0.040	0.187
Constant	5.073***	0.001		
N	446			
R <sup>2</sup>	0.156			
LL	-260.76			
AIC	557.53			
BIC	631.34			

Regarding variable coding, CRT and Financial literacy are scores ranging from 0 to 3 to the respective standard test. For EMBC and altruism constructs we computed a general score adding their scales' items. Risk Tolerance range from 1 to 5, and represents the lottery chosen by participants, 5 being the highest risk lottery. High Risk (HR) Both, High Risk (HR) SRI, High-Risk Sin are three dummy variables representing our experimental treatments regarding risk (base category being thus low risk both). Similarly, Model Woman and Model Man are dummies coding for respondents having seen these models (base category being thus no human model). \*, \*\* and \*\*\* respectively indicate  $p < 10\%$ ,  $p < 5\%$  and  $p < 1\%$ . The average marginal effects were estimated at the means. We do not display these marginal effects for the interaction in this table, as they present specific complexity, and instead display them in Figure 8.

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