

Faith-based versus secular Impact Investors: How different are faith-based economic and behavioural motives? A game-theoretic approach

Richard Fairchild, School of Management, University of Bath

3rd July, 2026

Abstract

The intersection of religious belief and financial decision-making constitutes one of the most underexplored yet practically significant areas within behavioural finance and investment studies. While the broader secular field of Socially Responsible Investing (SRI), Environmental, Social and Governance (ESG) investing, and impact investing has attracted considerable academic attention, the distinctive role of Spirituality and Faith as a driver of investment purpose, values, and practice remains insufficiently theorised. Furthermore, there is little understanding of the possible differences in the motives of secular and Faith-based impact investors. When considering the motives of impact investors to think beyond the money towards social mission, we can naturally employ the behavioural economics framework of social preference theory (which considers altruism, fairness, trust, empathy, shared identity, reciprocity). A further useful distinction that we may consider within social preference theory is that of extrinsic (head-) versus intrinsic (heart-) motives for thinking beyond the money towards others' welfare.

In this paper, we begin by providing an in-depth review of the existing literature on the motives of secular impact investors. We then examine the small, but growing literature on Faith-based impact investors. Motivated by this analysis, we then develop a behavioural game-theoretic analysis, comparing the economic and behavioural motives of Faith-based and secular impact investors. Our game-theoretic model consists of four types of entrepreneur: an economic entrepreneur (purely focussed on the money, and not interested in social impact), a secular 'lukewarm' social entrepreneur (with low social mission impact), a secular 'passionate' social entrepreneur (with high social mission impact), and a Faith-based entrepreneur. On the financing side, our model contains three types of institutional investor: an economic investor (purely focused on the money, and not interested in social impact), a secular impact investor, and a faith-based impact investor. Each entrepreneur has an idea for a start-up venture, and thus brings a particular type of project to the market: each project provides economic value, but in addition, it may also provide social impact. Each entrepreneur seeks financing. Each institutional investor chooses an entrepreneurial type. Next, the investor and the chosen entrepreneur work together to create economic and social value. Hence, a double-sided moral hazard problem exists (double-sided effort shirking). We consider an equilibrium of our model characterising full market segmentation, a la Barigozzi and Tedeschi (2015)¹. That is, each dyad consists of an appropriate matching of investor and entrepreneur. That is, we end up with the following dyads in equilibrium: economic investor/economic entrepreneur: secular impact investor/secular social

¹ Barigozzi and Tedeschi (2015) create a market segmentation model consisting of economic and socially motivated entrepreneurs and banks. Like us, they derive a full market-segmentation equilibrium, in which the economic (socially-motivated) entrepreneur matches with the economic (socially-motivated) bank.

entrepreneur: Faith-based impact investor/faith-based entrepreneur. We demonstrate that this segmentation equilibrium depends crucially on both economic (financial return) and behavioural factors: the mutual passion for the project in each dyad, and the social mission (intrinsic and extrinsic) motives.

1. Introduction

In this paper, we develop a behavioural game-theoretic model in order to consider the motives of secular impact investors and faith-based investors to invest into social and faith-based entrepreneurs who think “beyond the money” towards social mission. In our model, we classify these faith-based investors and entrepreneurs as having Christian faith, but our analysis can be easily extended to considers other faiths.

Our model incorporates aspects of social preference theory. Particularly, when analysing the investors’ and entrepreneurs’ ability to think beyond the money, we consider both extrinsic and intrinsic motives to consider social mission: we discuss these motives further below. Ours is a model of financial market segmentation, whereby purely economic investors choose to invest in economic entrepreneurs, secular impact investors invest in secular entrepreneurs, and Christian investors invest in Christian entrepreneurs. Hence, our model has parallels with the market segmentation model of Baragozzi and Tedeschi (2015). In their model, they derive a full market-segmentation equilibrium, in which the economic (socially-motivated) entrepreneur matches with the economic (socially-motivated) bank.

The intersection of religious belief and financial decision-making constitutes one of the most underexplored yet practically significant areas within behavioural finance and investment studies. While the broader secular field of Socially Responsible Investing (SRI), Environmental, Social and Governance (ESG) investing, and impact investing has attracted considerable academic attention, the distinctive role of Spirituality and Faith as a driver of investment purpose, values, and practice remains insufficiently theorised. Furthermore, there is little understanding of the possible differences in the motives of secular and Faith-based impact investors. When considering the motives of impact investors to think beyond the money towards social mission, we can naturally employ the behavioural economics framework of social preference theory (which considers altruism, fairness, trust, empathy, shared identity, reciprocity). A further useful distinction that we may consider within social preference theory is that of extrinsic (head-) versus intrinsic (heart-) motives for thinking beyond the money towards others’ welfare.

1.1. Motivations and Differences

In this section, we begin by considering the existing research into the motives of Christian and secular impact investors. We ask, where are the areas of similarity and differences in their motives? In doing so, we consider the behavioural economics research into social preference motives (the ability to ‘think beyond the money’ towards social mission and social impact). We will focus heavily on the research into intrinsic and extrinsic motivations for social impact. In our review, we will draw from the academic research, and also we will consider the ‘real-world’ practical/practitioner material in this area.

1.2. Christian investors

Christian institutions often frame investment as a form of stewardship, rooted in theological commitments and biblical principles. Louche and Arenas (2008) highlight that many religious organisations view investment as part of their moral and spiritual mission. Halverson (2021) similarly argues that faith-driven investors often interpret capital deployment as spiritual practice tied to God's plan of redemption and human flourishing. This aligns with Gutsche's (2019) econometric analysis, which found that Christian religiosity correlates with greater emphasis on ecological and ethical criteria in financial decision-making.

Christian mutual funds, such as Ave Maria and Timothy Plan, apply strict exclusionary screens, for example, avoiding abortion, gambling, and pornography industries (Statman, 2005). These practices reveal a strong intrinsic orientation with values prioritised even at financial cost. Indeed, Castro et al. (2020) find that Christian mutual funds consistently underperform relative to secular SRI funds, a gap attributed to rigid screening criteria. The "money left on the table" dynamic illustrates that many Christian funds accept reduced returns in order to preserve fidelity to religious values.

Beyond exclusions, scholars note that faith-based investors often integrate positive screens that align with Christian conceptions of social good, such as investments in healthcare, education, or community development (Dion, 2009). This dual strategy, excluding "sin stocks" while favouring investments that visibly promote human flourishing, demonstrates that Christian institutional investors are motivated not simply by avoidance but also by a proactive vision of moral impact.

Another distinguishing feature of Christian investors is their long-term orientation. Theological notions of stewardship emphasise intergenerational responsibility, which encourages patience and resilience in the face of underperformance (Halverson, 2021). This differs from secular SRI investors, who often adjust strategies in response to market trends or reputational pressures (Benabou & Tirole, 2006). The literature suggests that Christian investors exhibit less flexibility in their criteria, meaning once exclusionary rules are adopted, they are rarely relaxed even during periods of economic downturn (Castro et al., 2020). This inflexibility highlights the robustness of intrinsic religious motivations, though it also limits portfolio diversification.

Finally, Christian institutional investors frequently coordinate through networks such as the Interfaith Center on Corporate Responsibility (ICCR), which file shareholder resolutions on issues ranging from labour rights to environmental protection (Dion, 2009). These collaborative efforts illustrate how faith-based investors leverage collective voice to amplify their impact, often prioritising advocacy over portfolio optimisation.

1.3. Secular social/impact investors

In contrast, secular SRI and impact institutions are motivated by a combination of social preference, reputation, and strategic positioning. The literature identifies both intrinsic and extrinsic drivers. For instance, Benabou and Tirole (2006) describe three motives for prosocial behaviour: altruism (intrinsic), social image concerns (extrinsic), and material incentives. Empirical work supports that socially responsible investing is often linked to signalling motivations, meaning investors may adopt SRI funds to project reputational benefits (Ariely et al., 2009; Fehrler & Przepiorka, 2013).

Secular SRI investors typically apply a broader and more flexible array of strategies than faith-based counterparts. In addition to exclusionary screens, these include ESG integration, shareholder engagement, and thematic investing (Friede, Busch & Bassen, 2015). Dyck and Caza (2022) show that these approaches often allow funds to align ethical preferences with competitive financial outcomes. This flexibility helps explain why evidence suggests that secular

SRI funds perform as well as, or in some cases better than, conventional funds, indicating that social objectives need not be traded off against returns.

A distinctive feature of secular SRI is its responsiveness to shifting stakeholder pressures. Dyck, Lins and Roth (2021) argue that corporate and institutional investors frequently adjust SRI strategies to reflect changes in consumer expectations, regulatory frameworks, or reputational risk. This indicates a stronger extrinsic component: values are pursued when they align with broader market or reputational incentives. In this sense, secular investors exhibit a higher elasticity in their criteria compared to Christian investors, adapting their screens or engagement practices to trends rather than holding rigid prohibitions (Benabou & Tirole, 2006).

Nevertheless, motivation for secular SRI is not devoid of intrinsic elements. A growing body of research suggests that investors may be genuinely motivated by pro-social preferences such as fairness or environmental concern (Andreoni, 1990; Barber, Morse & Yasuda, 2021). For some institutional actors, long-term sustainability is framed as both a moral and financial imperative, meaning improving governance and environmental practices is expected to yield better risk-adjusted returns over time (Friede et al., 2015). This blending of intrinsic altruism with extrinsic financial prudence often results in more integrated approaches than those observed in Christian funds.

Another distinguishing dimension is the emphasis on systemic impact. Secular institutional investors frequently engage in collaborative initiatives such as the UN Principles for Responsible Investment (PRI), where signatories commit to integrating ESG into investment analysis and decision-making. Unlike faith-based collaborations (e.g. ICCR), which are grounded in theological ethics, secular networks typically justify action in terms of reputational legitimacy, fiduciary duty, or long-term risk management (Dyck & Caza, 2022). This framing shows the dominance of extrinsic motivations in secular SRI at the institutional level, even when intrinsic motives are present.

Existing literature suggests that secular investors' greater adaptability gives them performance resilience, but potentially less motivational robustness. While Christian funds consistently uphold their exclusionary screens even during downturns, secular investors have been shown to relax or adjust criteria when markets shift or when reputational costs outweigh social commitments (Kwon & Samberger, 2021). Thus, secular institutional investors may achieve stronger financial outcomes, but their social commitment is more contingent, reflecting a motivational blend that leans toward extrinsic drivers.

1.4. Intrinsic vs extrinsic motivations

Park (2021) defines intrinsic religiosity as faith serving as a master motive, while extrinsic religiosity treats religion as instrumental for status or comfort. Applied to investing, Christian funds display strong intrinsic commitment: religious identity consistently outweighs financial return considerations (Smith et al., 2022). This mirrors Allport and Ross's (1967) classic distinction between religion "as an end" versus "as a means," helping explain why Christian investors uphold exclusionary screens despite underperformance (Castro et al., 2020).

Secular SRI investors, by contrast, tend to combine extrinsic motives (reputation, signalling, attracting inflows) with pragmatic intrinsic ones (long-term sustainability) (Ariely et al., 2009; Fehrer & Przepiorka, 2013). Their strategies often emphasise flexibility (ESG integration, engagement, or thematic tilts) which helps preserve competitiveness but makes value alignment more conditional (Friede, Busch & Bassen, 2015).

The literature therefore suggests a motivational asymmetry: Christian investors' intrinsic drivers are more robust but financially costly, whereas secular investors' blend of motives offers stronger performance resilience but less consistent ethical commitment.

1.5. Relative robustness of motivations

The literature suggests that Christian institutional investors display more resilient intrinsic motivations compared to secular counterparts. Whereas secular SRI strategies can shift with reputational pressures or portfolio trends, Christian funds' anchoring in faith and stewardship produces greater consistency in adhering to exclusionary screens (Diener & Habisch, 2022). However, this resilience comes at a cost: stricter adherence to intrinsic values often reduces financial efficiency, while secular investors' extrinsic balancing allows for closer alignment with financial benchmarks.

2. The Model

We consider an entrepreneurial market in which several types of entrepreneur are seeking finance for new start-up ideas. On the other side of the market, there are several types of institutional investors seeking to finance such projects.

Specifically, we consider four entrepreneurial types and three institutional investor types. The four entrepreneurial types each bring one type of project to the market. The first type is a standard economic entrepreneur, who brings a purely financial/ value-creating project (an economic project), with no "social mission" value creation. The second type is a luke-warm secular social entrepreneur, who brings a project with both financial value, and medium social mission. The third type is a passionate secular social entrepreneur, who brings a project with both financial value and high social mission. Finally, we consider a Christian Entrepreneur, who brings a project with financial return, and Kingdom mission.

On the other side of the market, there are equivalent institutional investor types. That is, the first type is a standard economic investor. The second type is a secular social impact investor (henceforth, referred to as a secular impact investor). The third type is a Christian impact investor.

The timeline of the game is as follows. At date 0, each entrepreneur requires investment funds of $I > 0$ in order to finance his start-up project. Each investor assesses the four entrepreneurs, and each decides which entrepreneurial type to finance. Each investor and chosen entrepreneur are referred to as a dyad. As there are three investors, the market consists of three dyads in equilibrium.

At date 1, each dyad works on creating economic value and social mission with the project at hand. That is, in each dyad, the investor and the entrepreneur each exert (economic and social) value-creating effort: the higher the effort levels, the higher the value created. Each partner owns an equity share of the value created. For simplicity, we assume that they own 50/50 equity shares: that is, they each own half of the equity.

Each partner's date 1 effort level is unobservable to the other partner. Since each partner only obtains half of the value-created, a standard double-sided moral hazard problem exists, in the form of inefficient effort levels.

At date 2, (economic and social) value-creation is achieved in each dyad, each partner obtains half of the economic value created (through their equal equity shares), and the social mission created benefits society (it is a public good, and does not accrue to the dyad partners, although

we will see that the dyad partners may gain some psychological utility from the social value creation: this psychological utility drives social value-creating efforts.

We define the total economic and social value creation of the dyad as:

$$V = V_{econ} + V_{social} \quad (1)$$

Where the first term is the economic value creation (that accrues to the dyad), and the second term is the social value (a public good that accrues to society).

The dyad partners' effort levels affect the economic and social value-creation as follows:

$$V = \gamma(e_E e_I)^{\frac{1}{2}}[(1 + \theta_{E,I})R_E + (\varphi_{E,I} + \mu_{E,I})M_E] \quad (2)$$

Where γ represents the dyad's synergistic ability. e_E and e_I represent the entrepreneur's and investor's respective effort levels. R_E is the base economic value created, given that the entrepreneur E has been selected, and $\theta_{E,I}$ is the value creation due to mutual passion for the project within the dyad. M_E is the base level of mission, given that the entrepreneur E has been selected, and $\varphi_{E,I}$ and $\mu_{E,I}$ are the respective mutual intrinsic and extrinsic weightings on social mission in the dyad.

The payoffs of each partner in the dyad are:

$$\pi_E = \pi_I = \frac{V}{2} = \frac{V_{econ} + V_{social}}{2} - \text{Cost of effort}. \quad (3)$$

This payoff captures the idea that the two dyad partners (the entrepreneur and the investor) share the economic value-created equally ($\frac{V_{econ}}{2}$), as they have equal equity stakes. We also assume that they share the excitement of the social value-creation equally ($\frac{V_{social}}{2}$): after all, they are partners, and they have worked on creating social value/social mission together. Recall that V_{social} is a public good. It does not accrue to the dyad financially: for the dyad partners, it is a psychological factor within their payoffs, over-and-above their financial return.

Note that the final term, the cost of effort, is operationalised as βe_i^2 . That is, they each face increasing marginal cost of effort.

Therefore, substituting (2) into (3), we obtain the indirect payoffs for the entrepreneur E and the investor I , in (4) below:

$$\pi_E = \pi_I = \frac{1}{2}[\gamma(e_E e_I)^{\frac{1}{2}}(1 + \theta_{E,I})R_E + \gamma(e_E e_I)^{\frac{1}{2}}(\varphi_{E,I} + \mu_{E,I})M_E] - \beta e_i^2 \quad (4)$$

Where $i \in \{E, I\}$.

We now employ equation (4) to begin to solve the equilibrium of the game. We first take as given that investor I has chosen entrepreneur E at date 0. Given that choice, we solve for each dyad partner's optimal date 1 effort. Then, given these optimal effort levels, we move back to date 0 to

solve for each investor's optimal choice of entrepreneur, thus solving for the equilibrium of the game.

2.1: The Dyad Partners' Optimal Date 1 Effort Level

The entrepreneur E and the investor I choose their optimal effort levels to maximise (4). That is, we derive each players' optimal effort level by solving $\frac{\partial \pi_i}{\partial e_i} = 0$ In payoff (4). We thus obtain the following optimal effort levels:

$$e_E^* = e_I^* = \frac{\gamma [(1+\theta_{E,I})R_E + (\varphi_{E,I} + \mu_{E,I})M_E]}{8\beta} \quad (5)$$

We observe in (5) that each player's optimal effort level is increasing in: a) The dyad's synergistic ability γ , b) The partners' mutual passion for working together on (the economic aspect of) the project: $\theta_{E,I}$, c) The base level of economic value-creation R_E , d) the dyad's intrinsic and extrinsic motivations for social value/social mission: $\varphi_{E,I} + \mu_{E,I}$ respectively, and e) the base level of mission created: M_E . Interestingly, b) – d) capture the idea that, being investors and entrepreneurs, they face a complex mix of economic and social motives.

Substituting these optimal effort levels into $\gamma(e_E e_I)^{\frac{1}{2}}$ in equation 2, equation (2) yields the total (economic plus social) indirect value of the venture, as follows:

$$V = \frac{\gamma^2 [(1+\theta_{E,I})R_E + (\varphi_{E,I} + \mu_{E,I})M_E]}{8\beta} [(1 + \theta_{E,I})R_E + (\varphi_{E,I} + \mu_{E,I})M_E] \quad (6)$$

Recall from (1) that $V = V_{econ} + V_{social}$. Therefore,

$$V_{econ} = \frac{\gamma^2 [(1+\theta_{E,I})R_E + (\varphi_{E,I} + \mu_{E,I})M_E]}{8\beta} [(1 + \theta_{E,I})R_E] \quad (7)$$

And:

$$V_{social} = \frac{\gamma^2 [(1+\theta_{E,I})R_E + (\varphi_{E,I} + \mu_{E,I})M_E]}{8\beta} [(\varphi_{E,I} + \mu_{E,I})M_E] \quad (8)$$

It is interesting to note, from (7) and (8) that, since the partners' effort levels affect both economic and social value creation, increasing each of the economic and social factors/motives (a-e above) enhances both economic and social value creation, reflected in the first term (the fraction) in (7) and in (8), which represents the effect of the joint efforts, $\gamma(e_E e_I)^{\frac{1}{2}}$ on value creation.

Having analysed the breakdown of total value creation into economic and social value creation in (6), (7), and (8), we now simplify equation (6) as follows:

$$V = \frac{\gamma^2[(1+\theta_{E,I})R_E + (\varphi_{E,I} + \mu_{E,I})M_E]^2}{8\beta} \quad (9)$$

We substitute (9) into (3) (equivalently (4)) to obtain the dyad partners' payoffs:

$$\pi_E = \pi_I = \frac{3\gamma^2[(1+\theta_{E,I})R_E + (\varphi_{E,I} + \mu_{E,I})M_E]^2}{64\beta} \quad (10)$$

2.2: Date 0: Investors' choice of Entrepreneur

Having solved for the date 1 optimal effort levels for given dyad formations (that is, for each investor's choice of entrepreneur to finance and work with), we now move back to date 0, to solve for each investors' optimal choice of entrepreneur. In doing so, we work with equation (10). Each investor chooses the entrepreneur at date 0 who maximises the investor's payoff in (10).

Recall that we consider 3 types of investor (an economic investor, a secular social impact investor, and a Christian social impact investor) and 4 types of entrepreneur (an economic entrepreneur, a luke-warm social entrepreneur, with a project with medium social mission, a passionate secular social entrepreneur, with a project with high social mission, and a Christian entrepreneur, with a project with Kingdom Mission). Thus, we have 12 potential dyad combinations of investor and entrepreneur. In order to solve for each investor's date 0 choice of entrepreneur, we now make a number of (realistic and justifiable) assumptions regarding the effects of the various investor-entrepreneur combinations on the parameters of the model in equation (10).

First, to simplify we assume that the synergy parameter γ is identical across all of the dyads.

Next, we reduce the decision-space by assuming the following:

A:1: For the economic investor, $\theta_{E,I} = 0$; $\varphi_{E,I} = 0$; $\mu_{E,I} = 0$ for any choice of entrepreneur.

That is, the economic investor, who has no interest in social mission, has a 'cold and distant' relationship with any type of entrepreneur, and therefore, the dyad has no interest in social

mission. Recall that each entrepreneur is defined by the project that he brings to the market. We assume the following:

A.2: *The base economic and social mission values are as follows:*

$$R_{EE} > R_{LSE} > R_{PSE} > R_C,$$

$$M_C > M_{PSE} > M_{LSE} > M_{EE} = 0.$$

Assumption A:2 captures the idea that there is a trade-off between economic value-creation and social mission. An entrepreneur with a higher economic value-creation has a lower social mission value. Note that in the case of the economic entrepreneur, he has the highest economic value creation, but the lowest social mission value, equal to zero.

Consider the economic investor's choice of entrepreneur. Given assumption A:1 above, and employing equation (10), the economic investor's payoff, given his choice of any entrepreneur i is:

$$\pi_I = \frac{3\gamma^2 R_i^2}{64\beta} \quad (11)$$

Next, given assumption A:2, the economic investor unambiguously chooses the economic entrepreneur. Since the economic investor does not care for social mission, and has a cold-and-distant relationship with any of the entrepreneurs, his optimal choice of entrepreneur is the one that has the highest economic value-created. That is, he chooses the economic entrepreneur. Thus:

Lemma 1: *The economic investor chooses the economic entrepreneur, since the economic investor is not interested in social mission, and has a cold-and-distant relationship with any chosen entrepreneur. The economic investor's choice of economic entrepreneur maximises the investor's economic payoff.*

Having considered the economic investor's choice of entrepreneur, we now move on to considering the secular impact investor, and the Christian Kingdom investor, and their choice of entrepreneur. As noted previously, we assume that each entrepreneur is defined by the project that he brings. We further assume that, in the social impact investing sector, the entrepreneur that the secular impact investor and the Christian Kingdom investor chooses is important for the creation of mutual passion and social mission motives in the dyad. Mutual passion and social mission motives only exist when each investor matches with his 'correct and appropriate' partner: that is, they only exist when the secular impact investor (Christian Kingdom investor) match with the secular social entrepreneur (Christian Kingdom entrepreneur). When they match "outside of their comfort zone" (the secular impact investor with the Christian Kingdom entrepreneur, and the Christian Kingdom investor with the secular social entrepreneur), mutual passion and social mission motives are zero. Furthermore, if either of these investors (secular impact or Christian Kingdom) choose the economic entrepreneur, the mutual passion and social mission motives again are zero.

In assumption A:3: a) and b), we formally consider the discussion above, in terms of the effect of the secular impact investor's and Christian Kingdom investor's choice entrepreneur on the creation of mutual passion and intrinsic/extrinsic social mission motives in the dyad.

A:3: The Christian investor's and secular impact investor's choice of entrepreneur affects these parameters as follows:

- a) $\varphi_{C.C} > \varphi_{SE.S} > 0$:
- b) $\theta_{C.C} > \theta_{SE.S} > 0$

c). $\mu_{VE.C} = 0$

Assumption A:3: a) (respectively b)) states that the intrinsic social mission motives (respectively mutual passion) for each dyad are highest in the Chistian entrepreneur/Christian investor dyad. They are next highest in the secular social entrepreneur/secular impact investor dyad. As noted above, all other dyad combinations bring zero social mission motives (and zero mutual passion).

Note that we assume that mutual dyad passion and the intrinsic mission motives are identical for the secular social entrepreneur/secular impact investor, regardless of whether the secular impact investor chooses the passionate or luke-warm social entrepreneur.

Assumption A:3: c) states that the Christian investor has no extrinsic social mission motives, whichever E he chooses. That is, the Christian investor's social mission motives are entirely pure and intrinsic.

We are now in a position to consider the secular impact investor's, and the Christian Kingdom investor's, choice of entrepreneur.

First, consider the secular impact investor's choice of entrepreneur. If this investor chooses the economic entrepreneur, the passionate social entrepreneur, the luke-warm entrepreneur or the Christian entrepreneur, from (10), the investor's respective payoffs are:

$$\pi_I = \frac{3\gamma^2 R_{EE}^2}{64\beta} \quad (12)$$

$$\pi_I = \frac{3\gamma^2 [(1+\theta_{SE.S})R_{PSE} + (\varphi_{SE.S} + \mu_{SE.S})M_{PSE}]^2}{64\beta} \quad (13)$$

$$\pi_I = \frac{3\gamma^2 [(1+\theta_{SE.S})R_{LSE} + (\varphi_{SE.S} + \mu_{SE.S})M_{LSE}]^2}{64\beta} \quad (14)$$

$$\pi_I = \frac{3\gamma^2 R_C^2}{64\beta} \quad (15)$$

We note that, from assumption A:2, (12) > (15). Therefore, the secular impact investor never chooses the Christian Kingdom entrepreneur. This is because the Christian kingdom entrepreneur/secular impact investor dyad does not create any mutual passion, and does not create any dyadic social mission motives: and, on the downside for the secular impact investor, the Christian Kingdom entrepreneur brings the project with the lowest financial return.

Since (15) is dominated, we must focus our attention on comparing (12) – (14) in order to determine the secular impact investor's optimal choice of entrepreneur.

Our way of focusing this is by considering the effect of the intrinsic and extrinsic social mission motives. Firstly, define a critical level of intrinsic plus extrinsic social mission, $[\varphi_{SE.S} + \mu_{SE.S}]'$, which equates (13) and (14). Thus:

$$[\varphi_{SE.S} + \mu_{SE.S}]' = \frac{(1+\theta_{SE.S})(R_{LSE}-R_{PSE})}{(M_{PSE}-M_{LSE})} \quad (16)$$

Thus, iff $\varphi_{SE.S} + \mu_{SE.S} > [\varphi_{SE.S} + \mu_{SE.S}]'$, (that is, the actual level of intrinsic plus extrinsic motives exceeds the critical level), the secular impact investor prefers to choose the passionate social entrepreneur (who provides lower financial return, but higher social mission). Conversely, if $\varphi_{SE.S} + \mu_{SE.S} \leq [\varphi_{SE.S} + \mu_{SE.S}]'$, this secular impact investor prefers to choose the luke warm social entrepreneur (who provides higher financial return, and lower social mission).

Recall that $R_{LSE} > R_{PSE}$, and $M_{PSE} > M_{LSE}$: thus, the right-hand side fraction captures the financial/social mission trade-off for the secular impact investor when making his choice of luke-warm or passionate social entrepreneur. The larger the numerator (the larger the increase in financial return from choosing the luke-warm social entrepreneur compared to the passionate social entrepreneur), the larger the critical level, and hence the larger that the actual level of extrinsic and intrinsic motives need to be, for the secular impact entrepreneur to shift from the luke-warm to the passionate social entrepreneur.

We assume that , $\varphi_{SE.S} + \mu_{SE.S} > [\varphi_{SE.S} + \mu_{SE.S}]'$, thus (13) > (14): the investor prefers the passionate to the luke-warm social entrepreneur. Thus, we now compare (13) and (12). We define a critical level of intrinsic plus extrinsic motives $[\varphi_{SE.S} + \mu_{SE.S}]''$ that equates (12) and (13). We thus derive the following.

$$[\varphi_{SE.S} + \mu_{SE.S}]'' = \frac{R_{EE} - (1+\theta_{SE.S})R_{PSE}}{M_{PSE}} \quad (17)$$

We assume that the secular impact investor's level of intrinsic and extrinsic motives are sufficiently large that $\varphi_{SE.S} + \mu_{SE.S} > [\varphi_{SE.S} + \mu_{SE.S}]''$: thus, (13) > (12). The secular impact investor prefers to choose the passionate social entrepreneur to the economic entrepreneur.

Drawing all of this together, we derive that the secular impact investor optimally chooses the passionate social entrepreneur from the selection of four entrepreneurs.

Finally, consider the Christian Kingdom investor's choice of entrepreneur. If this investor chooses the economic entrepreneur, the passionate social entrepreneur, the luke-warm entrepreneur or the Christian entrepreneur, from (10), the investor's respective payoffs are:

$$\pi_I = \frac{3\gamma^2 R_{EE}^2}{64\beta} \quad (18)$$

$$\pi_I = \frac{3\gamma^2 R_{PSE}^2}{64\beta} \quad (19)$$

$$\pi_I = \frac{3\gamma^2 R_{LSE}^2}{64\beta} \quad (20)$$

$$\pi_I = \frac{3\gamma^2 [(1+\theta_{C.C})R_C + (\varphi_{C.C})M_C]^2}{64\beta} \quad (21)$$

Comparing (18) – (21), we note that (19) and (20) are dominated by (18). This is because, if the Christian investor does not choose the Christian entrepreneur, there is no mutual passion or mission motives in any other dyad. Therefore, the Christian investor's best alternative to choosing the Christian entrepreneur is to choose the economic entrepreneur. Thus, we simply compare (18) and (21) to obtain the Christian investor's optimum choice. We assume that the intrinsic incentives are high enough that he optimally chooses the Christian entrepreneur.

Drawing all of this discussion together, we obtain the following equilibrium result of the game.

Proposition 1:

The equilibrium of the game is characterised by complete market segmentation.

- a) *The economic investor chooses the economic entrepreneur.*
- b) *The secular impact investor chooses the passionate social entrepreneur, with the lowest financial return in the social impact sector, but the highest social impact.*
- c) *The Christian Investor chooses the Christian Kingdom entrepreneur.*

3: The effect on Total Welfare

In this section, we consider the implication of the choices described in proposition 1 for total welfare. We define total welfare as:

$$W = V_{E.E} + V_{PSE.S} + V_{C.C}.$$

From equation (9), total welfare is:

$$W = \frac{\gamma^2(R_E^2 + [(1 + \theta_{SE.S})R_{PSE} + (\varphi_{SE.S} + \mu_{SE.S})M_{PSE}]^2 + [(1 + \theta_{C.C})R_C + (\varphi_{C.C})M_C]^2)}{8\beta}$$

Which consists of both economic value created, and mission created.

It is useful at this point to break this down into economic value created, and mission created, as discussed around equation (7) and (8).

Total welfare consists of:

$$W = W_{Econ.Value} + W_{Social.Value}$$

Where $W_{Econ.value}$ is given by:

$$\frac{\gamma^2(R_E^2 + [(1 + \theta_{SE.S})R_{PSE} + (\varphi_{SE.S} + \mu_{SE.S})M_{PSE}](1 + \theta_{SE.S})R_{PSE} + [(1 + \theta_{C.C})R_C + (\varphi_{C.C})M_C](1 + \theta_{C.C})R_C)}{8\beta}$$

And $W_{Social.Value}$ is given by:

$$\frac{\gamma^2[(1 + \theta_{SE.S})R_{PSE} + (\varphi_{SE.S} + \mu_{SE.S})M_{PSE}](\varphi_{SE.S} + \mu_{SE.S})M_{PSE} + [(1 + \theta_{C.C})R_C + (\varphi_{C.C})M_C](\varphi_{C.C})M_C]}{8\beta}$$

4. Shifting Social Mission Motives

We now consider a case where social mission motives shift. Following much of the existing literature (see our literature review at the beginning of our paper), we assume that the Christian investor's intrinsic motives are robust: they do not shift with the vagaries of time and culture. However, for the secular impact investor, the extrinsic motives are fragile. Consider a situation where a shift in market conditions causes a reduction in the secular social impact investor's extrinsic motives. Furthermore, assume that this reduction is dramatic enough for the condition above to shift to:

$$\varphi_{SE.S} + \mu_{SE.S} < [\varphi_{SE.S} + \mu_{SE.S}]',$$

Therefore, the secular impact investor shifts from the passionate social entrepreneur to the lukewarm social entrepreneur (with higher financial return, but lower social mission). As in proposition 1, the economic investor continues to invest in the economic entrepreneur, and the Christian investor continues to invest into the Christian entrepreneur.

Total welfare now becomes:

$$W = \frac{\gamma^2(R_E^2 + [(1 + \theta_{SE.S})R_{LSE} + (\varphi_{SE.S} + \mu_{SE.S})M_{LSE}]^2 + [(1 + \theta_{C.C})R_C + (\varphi_{C.C})M_C]^2)}{8\beta}$$

And the break-down is now:

$W_{Econ.value}$ is given by:

$$\frac{\gamma^2(R_E^2 + [(1 + \theta_{SE.S})R_{LSE} + (\varphi_{SE.S} + \mu_{SE.S})M_{LSE}](1 + \theta_{SE.S})R_{LSE} + [(1 + \theta_{C.C})R_C + (\varphi_{C.C})M_C](1 + \theta_{C.C})R_C)}{8\beta}$$

And $W_{Social.Value}$ is given by:

$$\frac{\gamma^2[(1 + \theta_{SE.S})R_{LSE} + (\varphi_{SE.S} + \mu_{SE.S})M_{LSE}](\varphi_{SE.S} + \mu_{SE.S})M_{LSE} + [(1 + \theta_{C.C})R_C + (\varphi_{C.C})M_C](\varphi_{C.C})M_C]}{8\beta}$$

5: Numerical/Graphical Analysis

In this section, we clarify by considering a numerical/graphical analysis. Employing our model, we assign the following parameter values.

The entrepreneurial type affects the base economic and social mission values as follows:

$$R_{EE} = 100,000; R_{LSE} = 8,000; R_{PSE} = 4,000; R_{CE} = 1,000. M_{EE} = 0; M_{LSE} = 5,000; M_{PSE} = 10,000; M_{CE} = 15,000.$$

Recall that, in our model, we have assumed that the Christian investor only has (robust) intrinsic motives. In our numerical analysis, we assign the parameter value: $\varphi_{C.C} = 20$.

To sharpen our analysis, in our numerical example, we assume that the secular impact investor/social entrepreneur dyad only has (fragile and volatile) extrinsic motives.

We model this volatility of motives by considering a range of values for the extrinsic motives: $\mu_{SE.S} \in [0,10]$. This reflects the idea that extrinsic motivation is fragile, and subject to the vagaries of the market and of culture.

The dyad mutual passion parameters are as follows:

$$\theta_{SE.S} = 5; \theta_{C.C} = 10.$$

Finally, the ability and cost-of-effort parameter are respectively:

$$\gamma = 10; \beta = 100,000$$

These parameters are consistent with complete market segmentation, as in proposition 1. That is, the economic investor chooses the economic entrepreneur; the secular impact investor chooses the secular social entrepreneur (either the luke-warm entrepreneur, with low social mission, or the passionate entrepreneur, with high social mission). The Christian investor chooses the Christian entrepreneur.

Next, note that, substituting the relevant parameter values into equation (16), we obtain the critical level of combined social mission motives (intrinsic plus extrinsic) for the secular impact investor:

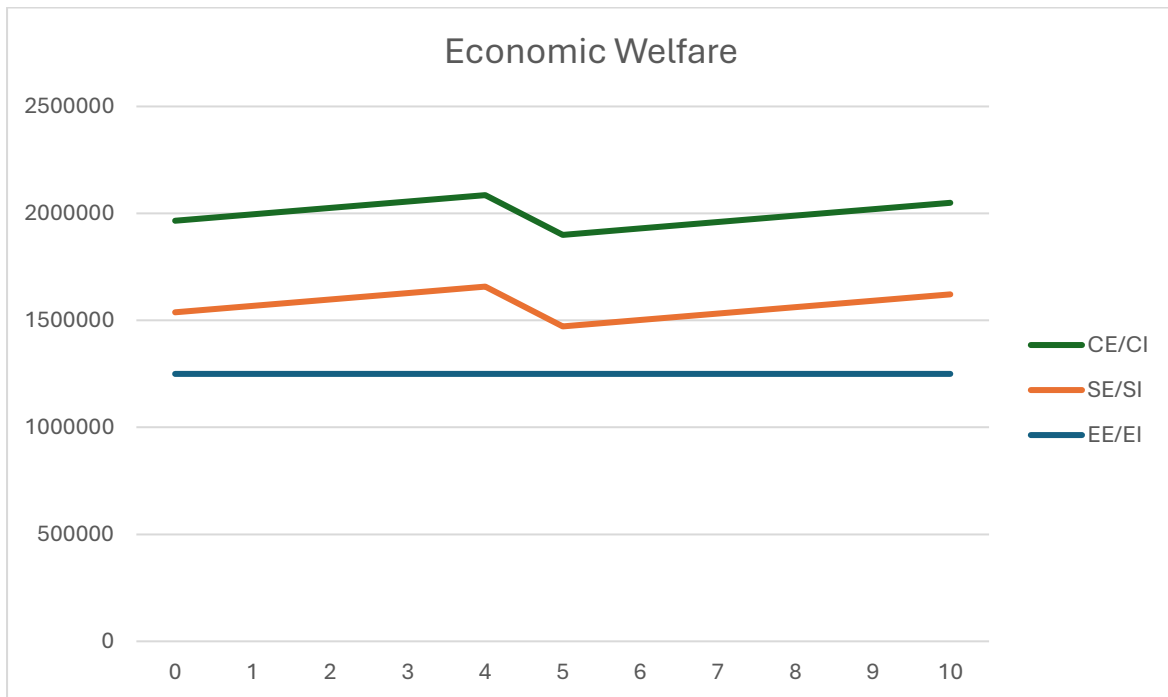
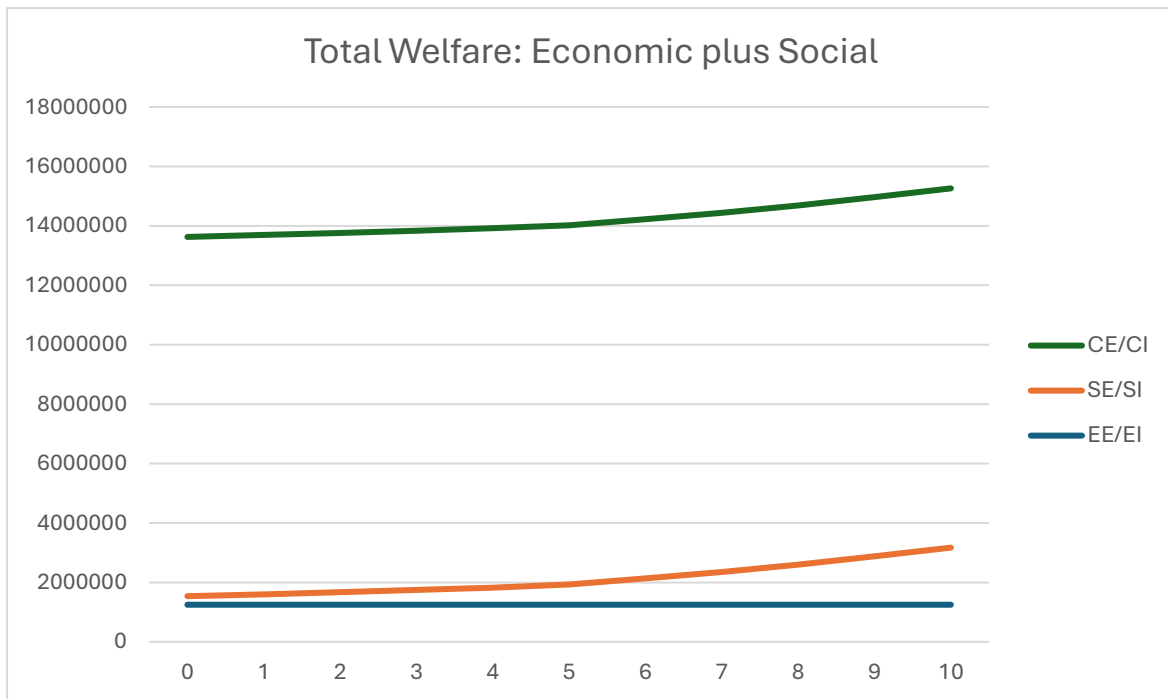
$$[\varphi_{SE.S} + \mu_{SE.S}]' = 4.8.$$

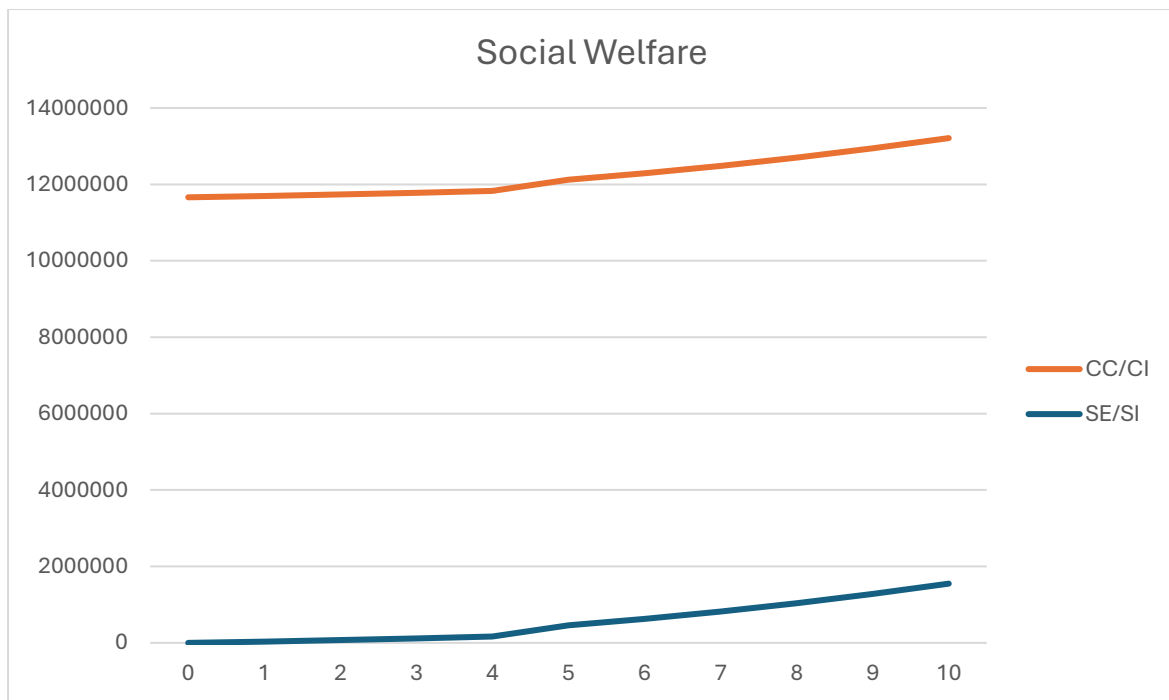
Recall that we assume here that the secular dyad's intrinsic motives are zero. Hence, the critical value for extrinsic motives reduces to

$$\mu_{SE.S}' = 4.8.$$

Hence, for $\mu_{SE.S}' \in [0,4.8)$, the secular impact investor chooses the luke-warm/low social mission entrepreneur. For $\mu_{SE.S}' > 4.8$, he chooses the passionate/high social mission entrepreneur.

Given these parameters (which, as noted, result in complete market segmentation), we present the following graphical results.





In each of these diagrams, the x-axis represents the level of extrinsic social mission motives for the secular dyad. The kink in each graph reflects the secular impact investors' switch from the luke-warm to the passionate social entrepreneur at the critical level of extrinsic motives: 4.8.

Next, we note that these 'regions' are stacked on top of each other, with the lowest area representing the economic investor/economic entrepreneur dyad. The next region upward is the secular investor/secular entrepreneur dyad. The top region is the Christian investor/Christian entrepreneur dyad.

By stacking these regions, the top line represents the total welfare (of the three dyads combined) in each diagram (total welfare, total economic welfare, and total social welfare respectively).

Our graphical analysis emphasises the following. Total societal welfare consists of both economic outcomes, and less financially/more intangible social outcomes, 'beyond the money.' Both aspects are valid and important for societal welfare. There is a place in the eco-system for purely financially focused entrepreneurs and investors, and they co-exist with socially-focused entrepreneurs and investors (both secular and faith-based).

Our graphs capture the effects of (intrinsic and extrinsic) motives of these social investors and entrepreneurs on welfare. Firstly, as we increase the secular dyad's extrinsic motives (moving along the X-axis), total welfare increases in each graph. Secondly, as we increase faith-based intrinsic motives, the total welfare lines will shift upwards (not shown in these diagrams).

We have discussed the effects of the robustness of intrinsic motives, and the fragility/volatility of extrinsic motives: the latter can be captured by movements back and forth along the X-axis.

Finally, comparing the three graphs captures the idea that total societal welfare consists of both economic and social impact. Note that we capture the potential trade-offs here: as we increase the secular dyad's extrinsic motives, the investor switches from the luke-warm to the passionate secular social entrepreneur. At that point, we note that economic welfare drops, while social

welfare rises. Furthermore, from that point, as we continue to increase the secular dyad's intrinsic motives, the total welfare (graph 1), and total social welfare (graph 2) increase at a faster rate (the slope is steeper), since the dyad now contains the passionate social entrepreneur, who cares deeply about social mission.

6. Conclusion

We have developed a behavioural game-theoretic model, consisting of different types of entrepreneur and investor (purely economic, secular social, and Christian). We have derived an equilibrium of full market segmentation, where each investor and entrepreneur match appropriately. Our equilibrium is crucially affected by a) mutual passion within each dyad for the project that they are working on, and b) the dyad's extrinsic and intrinsic motives for social mission.

Our model provides scope for future research. More work is needed on understanding the (intrinsic and extrinsic) motives of secular and faith-based investors and entrepreneurs. Theoretical models, such as the one in this paper, go part of the way to help us think about this research issue. This research will be deepened by quantitative and qualitative analysis.

References

- Allport, G.W. & Ross, J.M. (1967) Personal religious orientation and prejudice. *Journal of Personality and Social Psychology*, 5(4), pp.432–443.
- Andreoni, J. (1990) Impure altruism and donations to public goods: A theory of warm-glow giving. *The Economic Journal*, 100(401), pp.464–477.
- Ariely, D., Bracha, A. & Meier, S. (2009) Doing good or doing well? Image motivation and monetary incentives in behaving prosocially. *American Economic Review*, 99(1), pp.544–555.
- Baragozzi, F., and Tedeschi, P. Credit markets with ethical banks and motivated borrowers. *Review of Finance* 19(3). pp. 1281-1313
- Barber, B.M., Morse, A. & Yasuda, A. (2021) Impact investing. *Journal of Financial Economics*, 139(1), pp.162–185.
- Bénabou, R. & Tirole, J. (2006) Incentives and prosocial behavior. *American Economic Review*, 96(5), pp.1652–1678.
- Beer, F.M., Estes, J.P. & Deshayes, C. (2014) The performance of the faith and ethical investment products: A comparison before and after the 2008 meltdown. *Financial Services Review*, 23(4), pp.275–292.
- Church Publishing (2019) *A History of ICCR: Religious Investors and Shareholder Engagement*. Available at: <https://www.churchpublishing.org/>.
- Czerwonka, M. (2015) The influence of religion on socially responsible investing. *Journal of Religion and Business Ethics*, 3(1), Article 27.
- Diener, J. & Habisch, A. (2022) God's Stewards: A global overview of Christian-influenced mutual fund providers. *Journal of Risk and Financial Management*, 15(12), 547.
- Dion, M. (2009) Christian mutual funds, codes of ethics and corporate illegalities. *International Journal of Social Economics*, 36(9), pp.916–929.

- Dyck, A., Lins, K.V., Roth, L. & Wagner, H.F. (2019) Do institutional investors drive corporate social responsibility? International evidence. *Journal of Financial Economics*, 131(3), pp.693–714.
- Fehrler, S. & Przepiorka, W. (2013) Charitable giving as a signal of trustworthiness. *Evolution and Human Behavior*, 34(2), pp.139–145.
- Friede, G., Busch, T. & Bassen, A. (2015) ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, 5(4), pp.210–233.
- Gil-Bazo, J., Ruiz-Verdú, P. & Santos, A.A.P. (2010) The performance of socially responsible mutual funds: The role of fees and management companies. *Journal of Business Ethics*, 94(2), pp.243–263.
- Gutsche, G. (2019) Individual and regional Christian religion and the consideration of sustainable criteria in consumption and investment decisions: An exploratory econometric analysis. *Journal of Business Ethics*, 157(4), pp.1155–1182.
- Halverson, J.M. (2021) *Faith-Driven Impact Investing: Renewing a Belief that an Investment in Entrepreneurialism and Commerce is Central to God's Plan of Redemption and Human Flourishing*. Doctoral thesis, Bethel University.
- ICCR (n.d.) *Interfaith Center on Corporate Responsibility*. Available at: <https://www.iccr.org/>.
- Louche, C., Arenas, D. & van Cranenburgh, K.C. (2012) From preaching to investing: Attitudes of religious organisations towards responsible investment. *Journal of Business Ethics*, 110(3), pp.301–320.
- Statman, M. (2000) Socially responsible mutual funds. *Financial Analysts Journal*, 56(3), pp.30–39.
- UN PRI (n.d.) *What is responsible investment?* Available at: <https://www.unpri.org/>.