Betting on the Jockey: Evidence from Human Capital Crowdfunding

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Abstract
Access to early-stage finance remains a persistent barrier to entrepreneurship, particularly for individuals lacking collateral or verifiable venture performance. This paper studies a novel financing mechanism—crowdfunded human capital contracts (HCCs)—in which investors fund entrepreneurs directly in exchange for a share of their future income. Using unique data from the Upstart platform, we examine how capital is allocated when the underlying asset is the individual rather than the firm and revisit the classic "jockey versus horse" debate. We find that human capital characteristics are strong and robust predictors of funding outcomes, while project characteristics do not significantly affect capital allocation. This indicates that investors primarily "bet on the jockey" rather than the "horse" in this setting. We further show that funding outcomes are driven by the number of investors rather than the size of individual contributions, providing direct evidence that capital allocation operates through the extensive margin of participation. These findings highlight how contract structure shifts investor attention toward individual earning potential and shape the mechanisms through which capital is allocated under extreme uncertainty.

Keywords: Human capital contracts; Crowdfunding; Entrepreneurial finance; Income share agreements; Capital allocation

1. Introduction

Access to early-stage finance remains a central barrier to entrepreneurship, particularly for individuals lacking collateral or verifiable venture performance (Kerr and Nanda, 2015). In such contexts, investors must form expectations about future returns based on limited and noisy signals, raising fundamental questions about how capital is allocated when both the entrepreneur and the project are difficult to evaluate. This paper examines a novel financing mechanism—crowdfunded human capital contracts (HCCs)—in which investors fund entrepreneurs directly in exchange for a share of their future income. Using data from the Upstart platform, we study how investors allocate capital in this setting and revisit the classic "jockey versus horse" debate (Kaplan et al., 2009).

Human capital contracts represent a departure from traditional forms of entrepreneurial finance. Under conventional instruments such as debt or equity, investors obtain claims on firm-level cash flows and returns depend primarily on venture performance. By contrast, HCCs tie returns to the entrepreneur's total future income, including earnings generated outside the focal venture. This contractual structure shifts the basis of investment toward the individual. At the same time, crowdfunding introduces a decentralized allocation mechanism in which capital is supplied by many small investors rather than professional intermediaries.

These two features—income-contingent contracts and decentralized participation—jointly shape investor behavior. When returns depend on total income, signals of human capital become particularly salient, as they provide information about long-term earning potential. In contrast, project attributes may play a more limited role, as investor payoffs are not tied exclusively to venture performance. In addition, the crowdfunding environment implies that funding outcomes emerge from the aggregation of many individual participation decisions, rather than from the selection choices of a single investor. Understanding how these elements interact is central to assessing the role of HCCs in entrepreneurial finance.

To address this question, we develop a simple framework in which investors form expectations about future income based on observable signals of human capital and project characteristics and decide whether to participate in a campaign given these expectations. The model highlights two key mechanisms. First, while both human capital and project signals can influence expected returns, the structure of HCCs may increase the relative importance of founder characteristics. Second, funding outcomes are driven by participation, as higher expected returns increase the number of investors willing to contribute.

We bring these predictions to the data using a unique dataset of crowdfunding campaigns from the Upstart platform. The dataset provides detailed information on entrepreneur characteristics, project attributes, funding outcomes, and investor participation for a sample of early-stage campaigns. This setting offers a rare opportunity to observe how capital is allocated when the underlying asset is human capital rather than a firm.

Our empirical results are clear. First, human capital characteristics, particularly academic performance, are strong and robust predictors of funding outcomes. In contrast, project characteristics do not significantly affect capital allocation. This indicates that investors primarily "bet on the jockey" rather than the "horse" in this setting. Second, we show that funding outcomes are driven by the number of investors rather than the size of individual contributions, providing direct evidence that capital allocation operates through the extensive margin of participation. Together, these findings reveal a founder-centered and participation-driven allocation mechanism.

This paper contributes to the literature in three ways. First, it extends research on entrepreneurial finance by providing empirical evidence on a novel class of contracts in which investment is directed toward individuals rather than firms. Second, it contributes to the "jockey versus horse" debate by showing that, in the presence of income-contingent contracts, investors systematically place greater weight on founder characteristics than on project attributes. Third, it adds to the crowdfunding literature by identifying the mechanism through which capital is allocated, showing that funding is driven by participation rather than by the size of individual investments. More broadly, our findings suggest that HCC crowdfunding constitutes a distinct form of capital allocation in which investment decisions are anchored in individual earning potential and aggregated through decentralized participation. By linking returns to income and distributing investment decisions across many participants, these markets offer a new perspective on how capital can be allocated under conditions of extreme uncertainty.

The remainder of the paper proceeds as follows. Section 2 reviews the related literature. Section 3 presents the theoretical framework. Section 4 describes the data and empirical methodology. Section 5 reports the main empirical results. Section 6 examines post-campaign outcomes and discusses the sustainability of HCC crowdfunding. Section 7 concludes.

2. Related literature

Crowdfunding has emerged as an important alternative source of entrepreneurial finance, enabling individuals to raise capital from a large number of small investors through online platforms. Literature typically distinguishes between donation-based, reward-based, debt-based, and equity-based crowdfunding (Belleflamme et al., 2014; Mollick, 2014; Bruton et al., 2015). Across these models, funding decisions are primarily centered on projects or ventures, with returns tied to consumption value, contractual repayment, or firm-level performance.

A growing body of research has examined the determinants of crowdfunding success. Campaign outcomes have been shown to depend on a combination of project characteristics, signals, and social dynamics. In particular, project quality, campaign design, and investor behavior play a central role in shaping funding outcomes (Mollick, 2014; Ahlers et al., 2015; Colombo et al., 2015). Additional work highlights the role of geography, reputation, and investor heterogeneity in crowdfunding markets (Agrawal et al., 2011; Lin and Viswanathan, 2013; Kim and Viswanathan, 2013).

Despite these advances, the existing literature remains largely focused on ventures relative to individuals, leaving open the question of how capital is allocated when the underlying asset is the entrepreneur's human capital rather than a project.

2.1 Human capital and entrepreneurial investment

The importance of human capital in entrepreneurial finance has been widely recognized. A central question in the literature is whether investors should "bet on the jockey or the horse" (Kaplan et al., 2009). Empirical evidence suggests that both founder characteristics—such as education, experience, and prior success—and project attributes play important roles in investment decisions, particularly in early-stage settings where firm-level information is limited (Gompers et al., 2010; Kaplan et al., 2012; Bernstein et al., 2017; Gompers et al., 2020).

At the same time, entrepreneurial outcomes are highly uncertain and exhibit extreme skewness, with a small number of successful ventures accounting for a large share of returns (Hall and Woodward, 2010). This makes it difficult for investors to assess project quality ex ante and complicates the allocation of capital in early-stage markets.

While existing studies emphasize the joint importance of entrepreneurs and ventures, they typically examine settings in which the two are evaluated together. As a result, isolating the role of human capital remains challenging. A setting in which returns depend directly on the entrepreneur—rather than the venture—provides a unique opportunity to address this question.

2.2 Human capital contracts

Human capital contracts (HCCs), also known as income share agreements, provide such a setting. Under these contracts, individuals receive funding in exchange for committing a share of their future income over a predetermined period. The concept dates back to Adam Smith's notion of human capital as a form of productive asset (Smith, 1776), and was formalized by Friedman (1955), who proposed equity-like contracts as a solution to financing education under uncertainty.

Early implementations of HCCs were primarily in the context of education financing. The Yale Tuition Postponement Option in the 1970s allowed students to defer tuition in exchange for income-contingent repayments but ultimately failed due to adverse selection and contract design issues (Nerlove, 1975; Palacios, 2004). By contrast, Australia's Higher Education Contribution Scheme demonstrated that income-contingent repayment mechanisms can function effectively when supported by institutional enforcement (Chapman, 2006). These experiences highlight both the potential and the challenges of HCCs, particularly with respect to pricing, enforcement, and market design.

Private-sector initiatives have also explored HCCs as market-based instruments. Firms such as MyRichUncle and Lumni have experimented with income-share financing for education, with mixed success (Palacios, 2004; Venkataraman et al., 2017). More recently, platforms such as Upstart and Pave extended the concept to broader forms of human capital, including aspiring entrepreneurs. While these platforms demonstrated initial traction, they also revealed regulatory and scalability constraints, with Upstart eventually pivoting toward more conventional lending models in 2014 (Oei and Ring, 2015).

Human capital contracts implemented by platforms such as Upstart and Pave were structured as income-contingent agreements in which individuals received upfront funding in exchange for committing a fixed percentage of their future earnings over a predetermined horizon. Consistent with the broader ISA framework, repayment obligations were defined along three key dimensions: duration, income share, and capped repayment. First, contract duration was typically finite, ranging between five and ten years, during which payments were contingent on realized income rather than fixed installments. Second, the income share component required individuals to remit a predetermined fraction of their earnings, with typical ranges in the ISA market between approximately 5% and 20% depending on expected earning potential and contract length. Payments were conditional on surpassing a minimum income threshold, such that individuals with low earnings could defer or suspend payments. Third, contracts

incorporated an explicit repayment cap, limiting total payments to a multiple of the initial funding amount (often around 1.5 to 2 times the principal), thereby truncating the upside for investors while providing downside protection for borrowers. Taken together, these features produced a hybrid financial instrument combining elements of equity (income-linked returns) and debt (finite duration and capped repayment), and distinguished HCCs from traditional entrepreneurial finance contracts.

A growing body of legal scholarship has examined the implementation of HCCs in crowdfunding environments. Vogel (2015) analyzes platforms such as Upstart and Pave and shows that these arrangements operationalize income-based financing by allowing investors to fund individuals in exchange for a share of future earnings. He further argues that such contracts are likely to qualify as securities under the Howey test, thereby subjecting them to the regulatory framework of U.S. securities law. This perspective highlights the importance of disclosure requirements, investor eligibility constraints, and compliance costs, which may significantly affect the scalability and viability of HCC markets. More broadly, it underscores the role of legal and institutional constraints in shaping the emergence of markets for human capital.

A useful contrast emerges when comparing U.S.-based platforms such as Upstart and Pave with international initiatives such as Lumni. While Upstart implemented HCCs within a crowdfunding framework, relying on dispersed investors and operating under U.S. securities regulation, Lumni adopted a more centralized model, raising capital from institutional investors and deploying it through structured funds to finance students' education (Glinska et al., 2006; Ryatt, 2020). This distinction has important implications for market functioning. In the Upstart model, capital allocation is decentralized and driven by investor participation, making it sensitive to information frictions and regulatory constraints. By contrast, Lumni's intermediary-based structure allows for greater screening, risk pooling, and contractual standardization, potentially mitigating some of the adverse selection and coordination problems emphasized in the literature. At the same time, the two models highlight a fundamental trade-off: crowdfunding-based HCCs expand access to capital by lowering entry barriers for investors, while intermediary-based models may achieve greater scalability and stability by centralizing decision-making.

A central feature of HCCs is that they shift the underlying asset from a project or firm to an individual. This distinguishes them from traditional financial instruments and places them at the intersection of multiple literatures. Legal scholars emphasize classification and regulatory challenges (Oei and Ring, 2015; Vogel, 2015), while economic analyses highlight their

potential to address capital market failures in human capital investment (Palacios, 2004; Shiller, 2003). At the same time, theoretical work points to challenges such as adverse selection and information asymmetry, which may limit market viability (Herbst and Hendren, 2024).

2.3 Human capital contracts in entrepreneurial finance

The application of HCCs to entrepreneurship represents a natural but underexplored extension of this concept. Early-stage entrepreneurs face severe financing constraints due to lack of collateral, limited track records, and high failure rates (de Bettignies and Brander, 2007; Kerr and Nanda, 2015). Traditional financing instruments—such as bank loans, venture capital, and angel investment—are often either unavailable or highly selective, with only a small fraction of entrepreneurs accessing venture capital (Bygrave, 2007).

In this context, HCCs offer a distinct value proposition. By tying returns to future income rather than venture performance, they allow investors to benefit from the entrepreneur's broader career trajectory, even if the initial venture fails. This is particularly relevant evidence given that entrepreneurial careers are dynamic and often involve multiple ventures (Gompers et al., 2010). At the same time, HCCs typically involve capped upside and rely heavily on observable signals of human capital, which may limit their attractiveness for high-growth, high-variance ventures (Hall and Woodward, 2010).

Importantly, HCCs are not an alternative to crowdfunding per se, but rather a financial instrument that can be implemented through crowdfunding platforms. Platforms such as Upstart use crowdfunding mechanisms to match investors and entrepreneurs, combining income-contingent contracts with decentralized capital allocation.

This paper contributes to the literature by examining HCCs in a crowdfunding setting, thereby combining insights from entrepreneurial finance and crowdfunding research. We provide empirical evidence on how investors allocate capital when the underlying asset is human capital rather than a venture, offering a new perspective on the "jockey versus horse" debate.

To clarify these distinctions, Table 1 compares crowdfunded human capital contracts with other crowdfunding models. While traditional crowdfunding mechanisms focus on projects or firms, HCCs shift the unit of investment toward the individual entrepreneur. As a result, investor returns are tied to future personal income rather than solely to venture performance.

This distinction has important implications. First, HCCs reduce exposure to the failure of a single venture, as investors may still recover returns through the entrepreneur's labor market earnings. Second, the informational basis of investment shifts toward human capital signals,

while preserving a role for project-specific characteristics. Third, the payoff structure combines features of equity and debt: returns are variable and contingent on performance, but typically capped, limiting upside relative to equity investments (as graphically shown in Appendix A). Overall, HCC crowdfunding represents a hybrid model that differs fundamentally from existing mechanisms by enabling investment in lifetime earning potential.

Table 1. Crowdfunded Human Capital Contracts vs. Other Crowdfunding Models

Feature	**Reward-based**	**Equity**	**Lending (P2P)**	***HCC (ISA)***
Object of investment	Project / product	Firm	Firm / borrower	***Individual (Entrepreneur)***
Investor payoff	Non-financial (product, perks)	Equity returns (dividends, exit)	Fixed interest payments	***Share of future personal income***
Dependence on venture success	High	Very high	High	***Partial (depends on individual income)***
Downside protection	None	None	Limited (default risk)	***High (payments adjust to income)***
Upside potential	None	High (uncapped)	Limited (fixed interest)	***Capped***
Time horizon	Short	Long	Medium	***Medium–long***
Investor risk exposure	Project failure	Venture failure	Default risk	***Labor earnings risk***

This paper contributes to the literature by examining HCCs in a crowdfunding setting, thereby providing a context in which the relative importance of founder and project characteristics can be directly assessed. While prior research highlights the importance of both types of signals, it does not establish how they are weighted when investment is directed toward individuals rather than firms. By shifting the object of investment from the venture to the entrepreneur, HCC crowdfunding offers a setting in which the "jockey versus horse" question can be evaluated more cleanly. The empirical analysis exploits this setting to assess whether capital allocation is primarily driven by human capital or by project characteristics.

3. A simple model of HCC crowdfunding

3.1 Setup

We model human capital contract (HCC) crowdfunding as a market in which investors allocate capital to individuals rather than to firms. Entrepreneurs raise funds by committing a share of their future income, rather than issuing claims on firm-level cash flows. As a result, investor returns depend on the entrepreneur's long-term earning potential rather than solely on the success of a specific venture.

Let entrepreneur $i$be characterized by two components:

- θ_i: latent human capital, capturing persistent ability and long-term earning potential
- π_i: project-specific component, capturing expected venture profitability

Future income is given by:

$$Y_i = \theta_i + \lambda\pi_i + \varepsilon_i$$

where $\varepsilon_i$is an idiosyncratic shock, and $\lambda \in [0,1]$captures the extent to which returns depend on project performance relative to individual earning capacity.

The parameter λreflects the structure of the financial contract. Under traditional equity financing, returns are closely tied to venture outcomes, implying a relatively high value of λ. By contrast, under human capital contracts, returns are linked to total income, including earnings outside the focal venture. This reduces the dependence of returns on project performance and implies a lower value of λ.

Under HCC, investor payoff is given by:

$$R_i = \min(\alpha Y_i, \bar{R})$$

where $\alpha$is the contractual income share and $\bar{R}$is a repayment cap.

This formulation highlights two key features of HCCs. First, because income includes labor market earnings, investors may recover returns even if the venture fails, providing partial downside protection relative to equity financing. Second, the presence of a repayment cap truncates the right tail of the return distribution, limiting exposure to extreme outcomes.

3.2 Information and signal formation

Investors do not observe $\theta_i$or $\pi_i$directly. Instead, they observe a vector of signals:

$$S_i = (H_i, P_i, C_i)$$

where:

- H_i: human capital signals (e.g., GPA, education, institutional prestige)
- P_i: project signals (e.g., expected profitability)
- C_i: campaign signals (e.g., presentation features)

Investors form expectations about future income:

$$\mathbb{E}[Y_i \mid S_i]$$

Both human capital and project signals contribute to expected income. However, the relative weight placed on these signals depends on the parameter λ. When λ is low, expected returns depend primarily on human capital, while the informational content of project characteristics is reduced. This implies that contract structure can affect how investors process observable signals and evaluate investment opportunities.

3.3 Investor decisions and contract structure

Investors participate if expected returns exceed their reservation thresholds. Because returns depend on total income, HCCs allow investors to recover value through both entrepreneurial success and labor market outcomes. This reduces exposure to project-specific risk and increases the relevance of persistent human capital characteristics.

At the same time, project characteristics may still contribute to expected income through the $\lambda\pi_i$ term. However, when λ is sufficiently low—as in the case of HCCs—the marginal contribution of project signals to expected returns is limited relative to that of human capital.

The model therefore allows for both human capital and project characteristics to influence investor decisions, while predicting that contract structure may tilt the relative importance of these signals toward human capital.

3.4 Crowdfunding and participation

Funding occurs through a crowdfunding mechanism in which multiple investors independently decide whether to contribute. Total capital raised is:

$$K_i = N_i \cdot a$$

where:

- N_i: number of investors (participation)
- a: average contribution per investor

We assume that expected investment conditional on participation is constant:

$$\mathbb{E}[a \mid S_i] = \bar{a}$$

This assumption reflects the idea that participation decisions are driven by campaign-specific information, while investment size is largely determined by investor-specific constraints.
Each investor participates if:

$$\mathbb{E}[R_i \mid S_i] \geq \tau_j$$

where $\tau_j$is an idiosyncratic participation threshold. The expected number of investors is:

$$N_i = F(\mathbb{E}[Y_i \mid S_i])$$

Therefore, funding outcomes are increasing in expected income, and observable signals affect capital allocation primarily through participation rather than through investment size.

3.5 Implications for capital allocation

The model yields three testable implications.
First, because expected income depends directly on human capital, signals of founder quality should positively affect funding outcomes:

> *H1: Human capital positively affects funding outcomes.*

Second, because HCCs reduce the dependence of returns on project performance (i.e., lower λ), the relative importance of human capital should exceed that of project characteristics:

> *H2: Human capital is a stronger determinant of funding outcomes than project characteristics.*

Third, because funding is driven by decentralized participation decisions, observable signals should primarily affect the number of investors rather than the size of individual investments:

> *H3: Human capital affects funding outcomes through investor participation rather than investment size.*

Taken together, the model provides a framework in which contract structure shapes the mapping from observable signals to capital allocation. By linking returns to total income and reducing the role of project-specific outcomes, HCCs increase the salience of human capital in investor decision-making. The empirical analysis tests these predictions by examining both the determinants of funding outcomes and the mechanism through which capital is allocated. The model is further discussed in Appendix B.

4. Data and methodology

4.1 Institutional setting: Human capital contracts on Upstart

The empirical setting of this study is the early-stage market for human capital contracts (HCCs) implemented by the U.S.-based platform Upstart between 2012 and 2014. Upstart operated as an online marketplace in which individuals—primarily recent university graduates—raised funds from multiple investors in exchange for committing a share of their future income over a predefined period. In contrast to conventional crowdfunding models, where investors fund projects or firms, HCC crowdfunding shifts the object of investment toward the individual, with returns linked to the entrepreneur's future earnings rather than to firm-level outcomes.

A distinctive feature of the Upstart platform is the rich set of individual-level information disclosed to investors. Unlike most crowdfunding environments, where information about founders is limited, Upstart campaigns provided detailed data on the entrepreneur's background, including academic performance (GPA), educational attainment, and the institution attended. These variables are rarely available in other crowdfunding settings and provide direct measures of human capital, allowing for a more precise assessment of how investors evaluate founder quality. To our knowledge, this is one of the few settings in which detailed, standardized measures of human capital such as GPA are directly observable to investors.

The structure of fundraising campaigns on Upstart is also distinctive. Each entrepreneur specifies both a minimum funding threshold and a maximum funding cap. If the amount pledged by investors falls below the minimum threshold, the campaign fails and no funds are disbursed. If the minimum threshold is reached, the campaign is considered successful, but total funding cannot exceed the maximum cap. This upper bound reflects the structure of human capital contracts, in which repayments are linked to a share of future income and therefore limit the scale of feasible financing. As a result, funding outcomes reflect both investor participation and contractual constraints.

4.2 Data collection and sample construction

The dataset is constructed from archival information collected directly from the Upstart platform. Data were extracted in February 2014, prior to the platform's pivot away from income-share contracts, and include all campaigns completed by that date. Each observation corresponds to a single campaign and contains detailed information on the entrepreneur, the project, and the funding process.

The final dataset consists of 80 campaigns corresponding to individuals who explicitly state their intention to pursue entrepreneurial activities. It is important to note, however, that these individuals represent aspiring entrepreneurs, and not all of them necessarily go on to launch or sustain a venture after the campaign. As such, the analysis focuses on investment decisions made at the funding stage, rather than on realized entrepreneurial outcomes.

A defining feature of the dataset is that only successful campaigns are observed. Campaigns that failed to reach the minimum funding threshold were not accessible at the time of data collection and are therefore excluded from the sample. This introduces an important limitation: the analysis focuses on variation in funding outcomes conditional on success and does not identify the determinants of campaign success relative to failure.

Despite this limitation, the dataset provides a unique opportunity to examine how investors allocate capital in a setting where the underlying asset is human capital rather than a firm, and where detailed information on founder characteristics is directly observable.

4.3 Variables and measurement

The empirical analysis relies on variables capturing human capital, project characteristics, and campaign features, as summarized in Table 2, while Table 3 reports the correlation matrix. To examine the mechanism underlying funding outcomes, we also decompose total capital raised into participation and investment size.

Human capital is measured using a combination of academic and institutional indicators that proxy for the entrepreneur's long-term earning potential. Specifically, we use GPA, an indicator for whether the entrepreneur holds or is pursuing a postgraduate degree, and a measure of institutional quality based on the Shanghai Academic Ranking of World Universities (ARWU). The ranking refers to the latest academic institution attended by the entrepreneur or in which she is currently enrolled. To facilitate interpretation, we construct a university prestige measure defined as the negative logarithm of the ranking, so that higher values correspond to more prestigious institutions. We also construct a human capital index, defined as the standardized

average of GPA, postgraduate degree, and university prestige, capturing overall founder quality in a single variable.

Project characteristics are captured through a proxy for expected profitability. Because detailed financial information is not available, this variable is constructed manually based on campaign descriptions. Projects are classified into three categories: non-profit ventures, for-profit low-technology ventures, and for-profit high-technology ventures. In the empirical analysis, this classification is implemented using two dummy variables for high-technology and low-technology ventures, with non-profit ventures as the omitted (reference) category. This approach captures differences in expected scale and growth potential across projects while maintaining a parsimonious specification.

Campaign features and control variables account for additional factors that may influence funding outcomes. We include a dummy variable indicating the presence of a campaign video, which captures the informational environment faced by investors, and a variable indicating whether funds are used directly to finance the venture or instead to support the entrepreneur's personal effort. We further control for the funding goal, defined as the minimum threshold required for campaign success, and for demographic characteristics such as gender.

Funding outcomes are measured using two main indicators: the logarithm of capital raised, which captures the absolute scale of funding, and the ratio of capital raised to the minimum funding goal, which reflects relative campaign performance. To investigate the mechanism underlying funding outcomes, total capital raised is decomposed into the number of backers and the average investment per backer, capturing the extensive and intensive margins of participation. All monetary variables are expressed in logarithmic form to reduce skewness and improve comparability.

Correlations reported in Table 3 are generally moderate, suggesting that multicollinearity is unlikely to be a major concern. In particular, human capital variables are positively but not strongly correlated, supporting their interpretation as distinct signals, while project characteristics exhibit limited correlation with human capital measures, indicating that they capture a separate dimension of expected returns.

Table 2. Variable Definitions and Descriptive Statistics

Variable	Description	Unit	Min	Max	Mean	Std. Dev.
GPA	Academic performance	0–4 scale	2.50	4.00	3.44	0.34
Postgraduate degree	Postgraduate education	Binary	0	1	0.19	0.39
University prestige	-log ARWU ranking	Index	-4.95	0.00	-3.07	1.29
Human capital index	Composite human capital	Standardized	-1.46	1.79	0.00	0.65
High-tech venture	High-tech project	Binary	0	1	0.44	0.50
Low-tech venture	Low-tech project	Binary	0	1	0.45	0.50
Direct use of funds	Funds used for venture	Binary	0	1	0.35	0.48
Log funding goal	Minimum funding target	Log USD	9.21	12.00	10.39	0.67
Video	Campaign video	Binary	0	1	0.31	0.47
Female	Female entrepreneur	Binary	0	1	0.29	0.46
Log capital raised	Total capital raised	Log USD	9.21	11.51	9.79	0.63
Success ratio	Raised / goal	Ratio	0.13	1.01	0.65	0.32
Log number of backers	Number of investors	Log count	0.69	3.66	2.24	0.62
Log average investment	Avg investment per investor	Log USD	6.57	9.31	7.54	0.52

Notes: This table reports definitions and descriptive statistics for the main variables. Human capital index is the standardized average of GPA, postgraduate degree, and prestige. High-tech and low-tech ventures are relative to non-profit (omitted). Robust standard formatting aligned with regression tables.

Table 3. Correlation Matrix

	GPA	Postgrad.	Prestige	High-tech	Low-tech	Direct	Log goal	Video	Female
GPA	1.00								
Postgraduate	-0.01	1.00							
Uni.Prestige	0.20	0.18	1.00						
High-tech	-0.12	-0.04	0.13	1.00					
Low-tech	-0.06	0.14	-0.18	-0.80	1.00				
Direct	-0.24	-0.02	0.12	-0.07	0.13	1.00			
Log goal	0.01	0.26	0.28	0.21	-0.15	-0.07	1.00		
Video	0.10	-0.05	-0.07	0.17	-0.18	0.01	0.07	1.00	
Female	0.01	0.12	0.17	0.05	-0.07	0.06	0.01	-0.01	1.00

4.4 Empirical specification

To analyze the determinants of campaign outcomes, we estimate reduced-form regression models of the form:

$$Y_i = \beta_1 H_i + \beta_2 P_i + \beta_3 C_i + X_i'\gamma + \varepsilon_i$$

where H_i, P_i, and $C_i$denote human capital, project, and campaign variables, respectively, and $X_i$includes control variables.

Under the theoretical framework, funding outcomes can be interpreted as reflecting investor expectations about future returns, which are shaped by observable signals. The empirical specification therefore captures how investors translate information about human capital and project characteristics into funding decisions.

To assess the relative importance of founder and project characteristics, we conduct joint significance tests on blocks of variables and estimate alternative specifications using the human capital index. We further explore heterogeneity by estimating models separately for campaigns that finance the entrepreneur directly versus those that fund the venture.

Finally, to examine the mechanism underlying funding outcomes, we estimate separate regressions for the number of backers and the average investment per backer. This decomposition allows us to distinguish between participation-driven and investment-size-driven dynamics, consistent with the theoretical predictions.

All regressions are estimated using ordinary least squares with robust standard errors.

Given the structure of the data, the empirical analysis should be interpreted as descriptive rather than causal. The absence of unsuccessful campaigns implies that selection into funding is not observed, and the relatively small sample size limits statistical power. In addition, key variables, such as project profitability, are constructed using simplified classifications that may not capture the full heterogeneity of underlying ventures.

Despite these limitations, the dataset provides a rare and informative snapshot of an emerging market for human capital financing. It allows us to examine how capital is allocated when investors fund individuals rather than firms, and to identify the mechanisms through which observable signals shape funding outcomes.

5. Results

5.1 Baseline determinants of campaign success

Table 4 reports the baseline regression results examining the determinants of HCC crowdfunding campaign outcomes. Consistent with the theoretical framework, the estimated coefficients capture how investors translate observable signals into expectations about entrepreneurs' future income.

Across all specifications, human capital is a robust predictor of funding outcomes, providing strong support for H1. In particular, GPA is positive and statistically significant across all models. The magnitude of the coefficient implies economically meaningful effects: a one-unit increase in GPA is associated with a substantial increase in capital raised. This suggests that investors place significant weight on academic performance as an indicator of long-term earning potential.

The human capital index, reported in Table 4, yields similar results. It is positive and highly significant across all specifications, indicating that investors respond to overall founder quality rather than to a single proxy. In contrast, postgraduate degree and university prestige are less consistently significant when included individually, suggesting that their informational content overlaps with more granular measures such as GPA.

By contrast, project characteristics do not significantly affect funding outcomes. The coefficients on high-technology and low-technology ventures are not statistically significant across specifications, indicating that differences in expected project profitability do not play a central role in capital allocation in this setting.

Among control variables, the funding goal behaves as expected: larger targets are associated with higher amounts raised but lower completion rates, reflecting a trade-off between ambition and success probability. Campaign-level signals, proxied by the presence of a video, are not statistically significant, suggesting a limited informational role relative to core human capital signals. The coefficient on Female is not statistically significant across specifications, indicating no systematic differences in funding outcomes across gender.

Taken together, these results indicate that funding outcomes in HCC crowdfunding are primarily driven by human capital rather than by project characteristics.

Table 4. Baseline Determinants of Funding Outcomes

Dependent Variable→	*Log capital raised*			*Success ratio*		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
GPA	0.537**	0.453**		0.235**	0.217**	
	(0.214)	(0.018)		(0.116)	(0.104)	
Postgraduate		0.117			0.084	
		(0.186)			(0.094)	
University prestige		0.044			0.030	
		(0.051)			(0.027)	
Human capital index			0.259***			0.145***
			(0.093)			(0.048)
High-tech venture	0.290	0.080	0.013	-0.016	0.059	0.033
	(0.190)	(0.187)	(0.177)	(0.125)	(0.099)	(0.091)
Low-tech venture	0.217	0.163	0.103	0.067	0.087	0.064
	(0.188)	(0.176)	(0.174)	(0.121)	(0.093)	(0.090)
Direct use of funds	0.636	0.132	0.094	0.135	0.097	0.083
	(0.442)	(0.151)	(0.135)	(0.081)	(0.076)	(0.070)
Log goal		0.494***	0.468***		-0.261***	-0.270***
		(0.083)	(0.081)		(0.043)	(0.040)
Video		0.002	0.029		0.012	0.022
		(0.135)	(0.131)		(0.071)	(0.070)
Female		0.109	0.091		0.077	0.071
		(0.150)	(0.147)		(0.078)	(0.076)
Constant	7.674***	3.029***	4.802***	-0.230	2.557***	3.352***
	(0.823)	(1.345)	(0.839)	(0.451)	(0.711)	(0.421)
Observations	80	80	80	80	80	80
R^2	0.078	0.411	0.397	0.097	0.360	0.353

Notes: This table reports ordinary least squares (OLS) estimates of the determinants of funding outcomes in HCC crowdfunding campaigns. The dependent variables are the logarithm of capital raised and the success ratio, defined as the ratio of capital raised to the funding goal. Human capital is captured by GPA, an indicator for whether the entrepreneur holds or is pursuing a postgraduate degree, and university prestige, measured as the negative logarithm of the ARWU ranking. In alternative specifications, these variables are combined into a human capital index, constructed as the standardized average of GPA, postgraduate degree, and university prestige. Project characteristics are captured by two dummy variables indicating whether the venture is classified as high-technology or low-technology. The omitted (reference) category corresponds to non-profit ventures. Control variables include the logarithm of the funding goal, a dummy variable indicating the presence of a campaign video, a dummy variable for whether funds are used directly to finance the venture, and a gender indicator equal to one for female entrepreneurs. All regressions include a constant term and are estimated using robust standard errors, reported in parentheses. Statistical significance is denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5.2 Jockey versus horse

To assess the relative importance of founder and project characteristics, Table 5 reports a decomposition that isolates the contribution of each block of variables. Columns (1) and (4) include only project characteristics, columns (2) and (5) include only human capital variables, and columns (3) and (6) include both sets of variables.

The results provide clear support for H2. Models including only project characteristics exhibit limited explanatory power, and the coefficients on venture type are not statistically significant. In contrast, models including only human capital variables exhibit substantially higher explanatory power, with GPA remaining positive and statistically significant.

Importantly, when both sets of variables are included, the coefficients on human capital remain significant, while project characteristics continue to be statistically insignificant. Moreover, the increase in explanatory power from adding project characteristics to the full model is limited, indicating that these variables do not materially improve model fit once human capital is accounted for.

This pattern holds across both funding outcomes. The explanatory power of the jockey-only specification exceeds that of the horse-only specification for both the level of funding and the success ratio. Overall, these findings indicate that investors place greater weight on founder characteristics than on project characteristics when allocating capital, providing direct evidence that investors "bet on the jockey" rather than the "horse" in this setting.

As a robustness check, we examine whether the effect of project characteristics varies with the use of funds by estimating interaction specifications between contract structure and venture type. Specifically, we include interaction terms between the direct-use indicator and the high-technology and low-technology venture dummies. The estimated interaction coefficients are not statistically significant across all specifications. This suggests that the role of project characteristics does not increase when funding is tied more closely to the venture. In other words, even in settings where investment is directed toward the "horse," project attributes do not become a stronger determinant of capital allocation. This finding strengthens the main result that investors primarily rely on human capital signals, indicating that the dominance of the "jockey" over the "horse" is robust to variations in contract structure.

Table 5. Jockey versus Horse: Decomposition of Funding Outcomes

Dependent Variable→	*(1)* *Log raised* **Horse**	*(2)* *Log raised* **Jockey**	*(3)* *Log raised* **Full**	*(4)* *Success ratio* **Horse**	*(5)* *Success ratio* **Jockey**	*(6)* *Success ratio* **Full**
GPA		0.440**	0.453**		0.206**	0.217**
		(0.185)	(0.018)		(0.104)	(0.104)
Postgraduate		0.151	0.117		0.100	0.084
		(0.186)	(0.186)		(0.094)	(0.094)
University prestige		0.036	0.044		0.026	0.030
		(0.052)	(0.051)		(0.028)	(0.027)
High-tech venture	-0.052		0.080	-0.003		0.059
	(0.168)		(0.187)	(0.085)		(0.099)
Low-tech venture	0.056		0.163	0.038		0.087
	(0.166)		(0.176)	(0.085)		(0.093)
Direct use of funds	0.074	0.150	0.132	0.072	0.104	0.097
	(0.138)	(0.148)	(0.151)	(0.073)	(0.075)	(0.076)
Log goal	0.542***	0.489***	0.494***	-0.229***	-0.261***	-0.261***
	(0.084)	(0.081)	(0.083)	(0.041)	(0.042)	(0.043)
Video	0.021	-0.014	0.002	0.018	0.006	0.012
	(0.137)	(0.131)	(0.135)	(0.073)	(0.068)	(0.071)
Female	0.147	0.099	0.109	0.102	0.073	0.077
	(0.144)	(0.148)	(0.150)	(0.075)	(0.077)	(0.078)
Constant	4.076***	3.205***	3.029***	2.944***	2.655***	2.557***
	(0.866)	(1.267)	(1.345)	(0.430)	(0.665)	(0.711)
Observations	80	80	80	80	80	80
R^2	0.336	0.404	0.411	0.279	0.354	0.360

Notes: This table reports ordinary least squares (OLS) estimates comparing the relative importance of human capital ("jockey") and project characteristics ("horse") in determining funding outcomes. The dependent variables are the logarithm of capital raised and the success ratio, defined as the ratio of capital raised to the funding goal. Columns labeled "Horse" include only project characteristics, columns labeled "Jockey" include only human capital variables, and columns labeled "Full" include both sets of variables. Human capital is measured using GPA, an indicator for whether the entrepreneur holds or is pursuing a postgraduate degree, and university prestige, defined as the negative logarithm of the ARWU ranking. Project characteristics are captured by two dummy variables indicating whether the venture is classified as high-technology or low-technology. The omitted (reference) category corresponds to non-profit ventures. All specifications include the same set of control variables: the logarithm of the funding goal, a dummy variable indicating the presence of a campaign video, a dummy variable for whether funds are used directly to finance the venture, and a gender indicator equal to one for female entrepreneurs. A constant term is included in all regressions. Robust standard errors are reported in parentheses. Statistical significance is denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5.3 Participation mechanism

We next examine the mechanism through which human capital affects funding outcomes. Table 6 decomposes total capital raised into two components: the number of investors (participation) and the average investment per investor.

The results strongly support H3. Human capital, measured by the composite index, has a positive and statistically significant effect on the number of backers. This indicates that higher-quality founders attract a larger number of investors. In contrast, human capital has no statistically significant effect on the average investment per investor.

Project characteristics are generally not statistically significant and exhibit limited explanatory power in either specification, reinforcing the finding that investors do not rely on venture type when making funding decisions.

Taken together, these results indicate that funding outcomes are driven primarily by the extensive margin of participation rather than by the intensive margin of investment size. In other words, human capital increases total funding by attracting more investors, rather than by inducing larger individual contributions.

Table 6. Participation Mechanism in Funding Outcomes

Dependent Variable→	*(1)* *Log number of backers*	*(2)* *Log number of backers*	*(3)* *Log average investment*	*(4)* *Log average investment*
Human capital index	0.462***	0.368***	-0.056	-0.110
	(0.099)	(0.101)	(0.093)	(0.098)
High-tech venture	0.277*	0.180	0.071	-0.167
	(0.154)	(0.153)	(0.127)	(0.141)
Low-tech venture	0.307**	0.269*	-0.139	-0.166
	(0.149)	(0.153)	(0.145)	(0.145)
Direct use of funds		-0.013		0.106
		(0.125)		(0.135)
Log goal		0.270***		0.198**
		(0.085)		(0.091)
Video		-0.112		0.141
		(0.140)		(0.125)
Female		0.090		0.001
		(0.140)		(0.122)
Constant	1.984***	-0.751	7.637***	5.554***
	(0.118)	(0.870)	(0.101)	(0.919)
Observations	80	80	80	80
R^2	0.244	0.329	0.012	0.096

Notes: This table reports ordinary least squares (OLS) estimates examining the mechanism underlying funding outcomes in HCC crowdfunding by decomposing total capital raised into the number of investors (participation) and the average investment per investor. The dependent variables are the logarithm of the number of backers and the logarithm of the average investment per backer. Human capital is measured using the human capital index, constructed as the standardized average of GPA, postgraduate degree, and university prestige (defined as the negative logarithm of the ARWU ranking). Project characteristics are captured by two dummy variables indicating whether the venture is classified as high-technology or low-technology. The omitted (reference) category corresponds to non-profit ventures. Control variables include the logarithm of the funding goal, a dummy variable indicating the presence of a campaign video, a dummy variable for whether funds are used directly to finance the venture, and a gender indicator equal to one for female entrepreneurs. Columns (1) and (3) report parsimonious specifications, while columns (2) and (4) include the full set of controls. A constant term is included in all regressions. Robust standard errors are reported in parentheses. Statistical significance is denoted as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

6. Post-Campaign Outcomes and Market Sustainability

A central question in the literature on human capital contracts is whether such markets can be sustained in equilibrium, given concerns about adverse selection and private information (Herbst and Hendren, 2024). In particular, if individuals have superior information about their future earning potential, high-ability entrepreneurs may opt out of income-contingent contracts, potentially limiting the viability of such markets. In this section, we provide exploratory evidence on the sustainability of HCC crowdfunding from both the entrepreneur and the investor perspective.

6.1 Venture outcomes and entrepreneurial sustainability

We begin by examining post-campaign outcomes to assess whether ventures financed through HCC crowdfunding are viable from the entrepreneur's perspective. To construct these outcomes, we manually track each entrepreneur using their full name and educational background, cross-referencing this information with publicly available profiles on LinkedIn. This allows us to identify whether the entrepreneur proceeded to launch a venture following the campaign and to track its subsequent status over time.

Among the 80 entrepreneurs in the sample, 63 (79%) proceeded to launch a venture, while 13 did not and 4 lacked observable information. Of the ventures that were created, 33 (52%) remained active after five years.

While these figures are conditional on campaigns that successfully reached their funding target and should therefore be interpreted with caution, they are broadly comparable to survival rates observed in the general population of new firms. In the United States, data from the Bureau of Labor Statistics indicate that approximately half of establishments survive to their fifth year. This comparison suggests that ventures financed through HCC crowdfunding do not exhibit systematically lower survival rates despite the absence of traditional screening mechanisms such as venture capital selection. More broadly, this evidence is consistent with the idea that HCC financing does not systematically select lower-quality ventures.

At the same time, the structure of HCCs implies that venture survival is not the sole determinant of economic outcomes. Because repayment is linked to total income rather than to firm performance alone, entrepreneurs may generate returns for investors even when the venture does not succeed, for example through subsequent employment. This feature highlights a key distinction between HCC and traditional entrepreneurial finance, where firm survival and exit outcomes are the primary drivers of returns.

6.2 Indicative evidence on investor returns

The dataset does not contain direct information on payments made by entrepreneurs to investors. To provide a first indication of the potential return profile of HCC investments, we construct proxy-based estimates of returns using publicly available information on career trajectories and compensation (see Appendix C for details).

Given data limitations, these estimates should be interpreted as illustrative rather than precise measures of realized returns. In particular, income is inferred from external benchmarks, career trajectories may be imperfectly observed, and contract terms are approximated. Moreover, the sample includes only successfully funded campaigns, which may bias upward and understate downside risk.

With these caveats in mind, the estimated return distribution suggests that income-contingent contracts may generate positive outcomes for investors, with relatively limited dispersion compared to traditional early-stage investments. This pattern is consistent with the structure of HCCs, in which returns are linked to total income and capped at a predefined level, thereby reducing exposure to extreme outcomes.

Importantly, these findings are consistent with the main results of the paper, which show that investor decisions are primarily driven by expectations about individual earning potential. Because returns depend on total income rather than on venture performance alone, investors may be less exposed to the extreme risk profiles that characterize equity-based entrepreneurial finance.

6.3 Implications for market sustainability

Taken together, these findings provide preliminary and suggestive evidence that HCC crowdfunding may constitute a viable financing mechanism under certain conditions. From the entrepreneur's perspective, venture survival rates are broadly comparable to those observed in the general population, suggesting that HCC financing does not appear to select systematically weaker projects. From the investor's perspective, the estimated return profile is consistent with a more compressed distribution of outcomes, reflecting the income-contingent and capped structure of these contracts.

At the same time, these results should be interpreted with caution. The sample is relatively small, excludes unsuccessful campaigns, and relies on indirect estimates of investor returns. As a result, the analysis does not provide a definitive assessment of equilibrium outcomes, but rather a first empirical indication of how such markets may function in practice.

An important limitation to the development of HCC markets relates to the legal and regulatory uncertainty surrounding the nature of these contracts. As emphasized in the legal literature, income-contingent agreements such as HCCs may be classified as securities under existing regulatory frameworks, thereby subjecting them to disclosure requirements, investor restrictions, and compliance costs that can significantly constrain their scalability (Oei and Ring, 2015; Vogel, 2015). These challenges are not limited to the United States but also arise in other jurisdictions, where the classification and regulation of such contracts remain unsettled.
Overall, the evidence suggests that while HCC crowdfunding exhibits features consistent with a potentially sustainable market, its development is likely to depend on both institutional design and regulatory evolution. In this context, the results of this paper—showing that investors primarily rely on human capital signals and that capital allocation operates through participation—provide insight into the conditions under which such markets may emerge and function.

7. Conclusions

This paper examines the emergence of human capital contracts (HCCs) as a novel mechanism for financing entrepreneurial activity. Using data from crowdfunding campaigns on the Upstart platform, we provide empirical evidence on how investors allocate capital when returns are tied to entrepreneurs' future income rather than to firm-level outcomes.
Our findings show that human capital signals—particularly academic performance—are strong and robust predictors of funding outcomes. By contrast, project characteristics do not significantly affect capital allocation. These results provide clear evidence that investors primarily "bet on the jockey" rather than the "horse" in this setting.
More broadly, the results highlight the role of contract design in shaping capital allocation. By linking returns to individual income rather than to firm performance, HCCs shift the basis of investment toward human capital. This structure increases the salience of founder characteristics and reduces the relative importance of project-specific information.
We further show that funding outcomes are driven by the number of investors rather than the size of individual contributions. This indicates that capital allocation operates through the extensive margin of participation rather than the intensive margin of investment size. In other words, human capital attracts more investors but does not induce larger individual investments.

Taken together, these findings suggest that HCC crowdfunding constitutes a distinct form of capital allocation in which investment decisions are anchored in founder quality and aggregated through decentralized participation.

The analysis also provides preliminary evidence on the sustainability of such markets. While the results should be interpreted with caution given data limitations, they suggest that income-contingent contracts may offer a viable mechanism for financing entrepreneurial activity, particularly in settings where traditional signals of venture quality are limited.

These findings have implications for both research and practice. They highlight the importance of contract structure in shaping how investors process information and allocate capital and suggest that alternative financial instruments can expand access to early-stage finance by enabling investment in individuals rather than in projects alone.

Overall, HCC crowdfunding provides a new lens through which to understand capital allocation under extreme uncertainty. Future research should explore the scalability of such contracts, their long-term performance, and the institutional conditions under which markets for human capital can develop efficiently.

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Appendix A. Payoff Structure of Human Capital Contracts

This appendix provides a formal and intuitive description of the payoff structure of human capital contracts (HCCs), consistent with the model presented in Section 3, and compares it to alternative financing instruments commonly used in entrepreneurial settings. The objective is to clarify the economic logic underlying HCCs and to illustrate how their distinctive features shape investor returns and risk exposure.

Under a human capital contract, an investor provides funding in exchange for a fixed share of the entrepreneur's future income over a predetermined horizon, subject to a contractual repayment cap. Let total future income be given by:

$$Y = \theta + \pi$$

where θdenotes income derived from labor market activities and πdenotes income generated by the entrepreneurial venture. For simplicity, we omit the idiosyncratic shock term included in the main model.

Investor payoff is therefore given by:

$$R = \min(\alpha Y, \bar{R})$$

where $\alpha$is the contractual income share and $\bar{R}$is the repayment cap.

This formulation captures the defining characteristic of HCCs: returns are linked to the entrepreneur's total income rather than exclusively to venture performance. As a result, investors are exposed not only to the success of the venture but also to the broader earning capacity of the individual.

For comparison, equity crowdfunding yields a payoff of the form $R = s\pi$, where $s$is the investor's equity share, implying that returns depend entirely on venture outcomes and are zero if the venture fails. Debt-based crowdfunding, by contrast, provides a fixed repayment that is independent of realized income but subject to default risk. These alternative structures highlight the hybrid nature of HCCs, which combine elements of both equity and debt.

Figure A1 illustrates these payoff profiles as a function of total income. At low income levels, including scenarios in which the venture fails ($\pi = 0$), HCC investors may still receive payments from the entrepreneur's labor income θ, whereas equity investors receive no return. This provides a form of downside protection relative to equity financing. For intermediate income levels, HCC payoffs increase linearly with income at rate α, reflecting proportional

sharing of earnings. At higher income levels, however, the contractual cap binds, and the payoff becomes constant at $\bar{R}$. This truncation of the right tail limits the investor's exposure to extreme outcomes and distinguishes HCCs from equity, which retains unlimited upside potential.

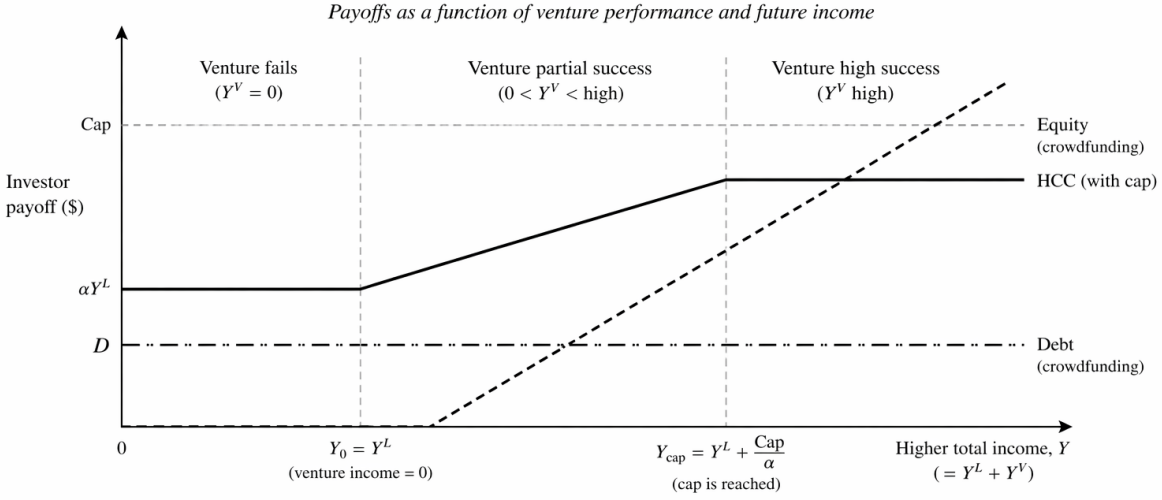
The presence of the cap has important implications for the distribution of returns. By limiting upside while preserving income-contingent repayment, HCCs generate a payoff profile with lower variance and reduced skewness relative to equity investments. At the same time, the probability of total loss is reduced relative to equity financing, as repayment can occur even when the venture fails. In this sense, HCCs embed an insurance-like component, as investors are partially protected against project-specific failure through exposure to the entrepreneur's broader income stream.

This payoff structure also implies that HCC returns are more closely linked to human capital than to firm performance alone. Whereas equity returns depend exclusively on π, HCC returns depend on both $\theta$and π, making them sensitive to factors such as education, skills, and labor market opportunities. This provides a theoretical foundation for the empirical finding that investor decisions in HCC crowdfunding are strongly influenced by human capital signals. At the same time, project characteristics remain relevant, particularly insofar as they contribute to expected income.

Overall, HCCs can be understood as a distinct financial instrument characterized by income-contingent returns, capped upside, and exposure to individual earning capacity (Figure A1). These features differentiate them from both equity and debt and justify treating HCC crowdfunding as a financing mechanism in which investment is anchored in individual earning potential while preserving a role for project outcomes.

Figure A1. Investor Payoffs under Alternative Crowdfunding Contracts

Payoffs as a function of venture performance and future income



HCC with cap:	$R^{\text{HCC}} = \min\{\alpha(Y^L + Y^V), \text{Cap}\}$	Paid from total income (labor + venture), up to a cap. Provides downside protection and capped upside.
Equity crowdfunding:	$R^{\text{EQ}} = \beta Y^V$	Paid only from venture income; zero payoff if the venture fails. Unlimited upside; high downside risk.
Debt crowdfunding:	$R^{\text{Debt}} = D$	Fixed repayment D, independent of income (subject to default risk).

Notes: Y^L = income from labor or other activities; Y^V = income from the venture; $Y = Y^L + Y^V$ = total future income.
$\alpha \in (0, 1)$ is the income share under HCC; $\beta \in (0, 1)$ is the equity share; Cap is the maximum cumulative repayment; D is the fixed repayment.

Appendix B. Model Clarifications and Extensions

This appendix provides additional clarification of the assumptions and mechanisms underlying the theoretical framework presented in Section 3. The objective is to make explicit the structure of investor decision-making and to formalize the drivers of capital allocation under human capital contract (HCC) crowdfunding, while maintaining a parsimonious and empirically grounded representation of the model.

B.1 Information and expectations

The model assumes that investors form expectations about the entrepreneur's future income based on publicly observable signals. Conditional on the information set S_i, all investors share common expectations:

$$\mathbb{E}[Y_i \mid S_i]$$

This assumption reflects the fact that campaign information on the platform is publicly observable and broadly homogeneous across investors. While investors may differ in their preferences or outside options, they are assumed to interpret observable signals in a similar way when forming expectations about future income.

Consistent with Section 3, expected income depends on both human capital and project-specific components:

$$Y_i = \theta_i + \lambda\pi_i + \varepsilon_i$$

where $\lambda \in [0,1]$ captures the extent to which returns depend on project performance. The relative weight placed on observable signals is therefore shaped by contract structure. In particular, when λ is low—as under HCCs—expected returns depend primarily on human capital, while the informational role of project characteristics is reduced.

B.2 Participation and investment decisions

Investor decisions are modeled in two stages: a participation decision and an investment decision conditional on participation.

Each investor participates in campaign i if expected returns exceed an idiosyncratic threshold τ_j:

$$\mathbb{E}[R_i \mid S_i] \geq \tau_j$$

where expected returns depend on expected income and the contractual income share. Participation thresholds capture heterogeneity in opportunity costs, risk tolerance, and outside investment opportunities.

Conditional on participation, the expected contribution is assumed to be:

$$\mathbb{E}[a_i \mid S_i] = \bar{a}$$

This assumption reflects the idea that participation decisions are driven by campaign-specific information, while investment size is largely determined by investor-specific constraints, such as wealth, diversification strategies, or platform-imposed limits. As a result, observable signals primarily affect the extensive margin (participation) rather than the intensive margin (investment size), consistent with the empirical findings.

B.3 Aggregation and funding outcomes

Given these assumptions, the expected number of participating investors is:

$$N_i = F(\mathbb{E}[Y_i \mid S_i])$$

where $F(\cdot)$is the cumulative distribution of participation thresholds.

Total capital raised is therefore:

$$K_i = N_i \cdot \bar{a}$$

This formulation implies that campaign outcomes depend on how observable signals shift the distribution of participation decisions across investors. Signals that increase expected income raise the proportion of investors whose participation thresholds are met, thereby increasing total funding.

Because expected returns are primarily driven by total income under HCCs, signals of human capital play a central role in shaping participation decisions, while the contribution of project characteristics is attenuated when $\lambda$is low.

B.4 Heterogeneity in the object of investment

A key feature of HCC crowdfunding is that the effective object of investment may vary depending on how funds are used. To capture this, the model introduces a parameter λ,

representing the extent to which returns depend on project-specific outcomes relative to individual earning capacity.

Expected income can be written as:

$$Y_i = \theta_i + \lambda\pi_i$$

When $\lambda$is high, returns depend more heavily on project performance, and project characteristics play a larger role in investor decision-making. When $\lambda$is low—as under HCCs—returns depend primarily on human capital, and variation in expected outcomes is driven largely by differences in individual earning potential.

This mechanism provides a theoretical foundation for differences across financing structures. In settings where returns are tied to firms, both human capital and project characteristics may be important. In contrast, when returns are tied to total income, the informational role of project characteristics is reduced, and human capital becomes the primary driver of investor decisions.

B.5 Relation to alternative financing models

The model highlights how HCCs differ from traditional financial contracts. Under equity financing, investor returns depend solely on project outcomes, implying that expected returns are primarily a function of π_i. Under HCCs, returns depend on total income, implying that both $\theta_i$and $\pi_i$contribute to expected returns, with their relative importance governed by λ.

In addition, the presence of a repayment cap distinguishes HCCs from equity by limiting exposure to extreme outcomes. Combined with income-contingent repayment, this feature leads to a more compressed return distribution, with lower variance and reduced skewness relative to equity investments.

As a result, HCCs shift the basis of investment toward human capital, increasing the salience of founder characteristics in investor decision-making while reducing reliance on project-specific signals.

B.6 Summary of mechanisms

Taken together, the model highlights three key drivers of capital allocation under HCC crowdfunding:

1. **Signal weighting:** Expected returns depend on both human capital and project characteristics, but contract structure determines their relative importance. Under HCCs, low values of λincrease the weight placed on human capital.

2. **Participation mechanism:** Funding outcomes are driven by the aggregation of decentralized participation decisions, with observable signals affecting the number of investors rather than the size of individual contributions.
3. **Contract structure:** By linking returns to total income and introducing a repayment cap, HCCs reduce exposure to project-specific risk and shift investor attention toward individual earning potential.

This framework provides a theoretical foundation for empirical results, which show that capital allocation in HCC crowdfunding is primarily driven by human capital and operates through participation.

Appendix C. Estimation of Investor Returns under Human Capital Contracts

This appendix describes the approach used to construct proxy-based estimates of investor returns under human capital contracts (HCCs). Because the dataset does not contain direct information on payments made by entrepreneurs to investors, the analysis relies on observable proxies for post-campaign income and on simplifying assumptions regarding contractual terms. The objective is not to recover precise measures of realized returns, but rather to approximate the magnitude and distribution of potential investor outcomes implied by HCC financing.

The defining feature of HCCs is that investor payoffs are linked to the entrepreneur's future income rather than to the performance of a single venture. Estimating returns therefore requires reconstructing income trajectories following the funding campaign. To do so, we identify each entrepreneur using their full name and educational background and locate corresponding professional profiles on LinkedIn. This allows us to trace post-campaign career paths, including both employment and entrepreneurial activity, and to establish a timeline of positions held, employers, and durations.

We then map these career trajectories into income estimates using external compensation data. For individuals employed in established firms, we match observed job titles, employers, and time periods to salary information obtained from Glassdoor. When salary ranges are available, we adopt conservative assumptions and use the lower bound of the reported range. For individuals who continue to operate their ventures, compensation is approximated using benchmark estimates of founder and CEO salaries reported in industry sources such as TechCrunch. These estimates are adjusted to reflect the size and stage of the venture, again using conservative assumptions where uncertainty is high.

Investor returns are then constructed by applying the contractual income-sharing rate to estimated income. Because detailed contract terms are not observable for all campaigns, we approximate the relevant share using the lower bound of income-sharing percentages observed in the sample. This ensures that the resulting return estimates are conservative. Estimated payments are aggregated over time to obtain a measure of total returns for each entrepreneur, from which summary statistics of the return distribution are computed.

This procedure yields a stylized characterization of the risk–return profile implied by HCC investments. However, it is important to emphasize that the resulting estimates are inherently imprecise. Income is inferred from industry benchmarks rather than observed directly, career histories may be incomplete or selectively reported, and entrepreneurial compensation is particularly difficult to measure. In addition, contract terms may vary across campaigns, while

the sample itself is restricted to successfully funded ventures. Finally, the absence of observed negative outcomes in the constructed sample may lead to an understatement of downside risk. For these reasons, the estimates should be interpreted as indicative rather than definitive. They intend to provide a first-order approximation of how HCC contracts translate income streams into investor payoffs, rather than a precise measure of realized financial performance. In this context, their primary value lies in illustrating the structure of returns under HCCs—specifically, the extent to which income-contingent repayment and capped upside generate a more compressed distribution of outcomes relative to traditional equity-based investments.

Table C1. Risk–Return Characteristics Across Entrepreneurial Investment Mechanisms

Metric	Equity Crowdfunding (Seedrs)	Venture Capital (Literature)	HCC (This Study, Estimated)
Average return (IRR)	~12.9%	~12–15%	~17.3%
Return dispersion (σ)	High	Very high (power-law)	~11.1%
Sharpe ratio	Low–moderate (~0.4–0.6)	Low (~0.2–0.4)	~1.55
Sortino ratio	~0.5 (approx.)	~0.2–0.3	High (>3, approx.)
Probability of loss	~22%	~70–80%	~0% (sample)

Notes: This table reports indicative risk–return characteristics across alternative entrepreneurial investment mechanisms. Estimates for equity crowdfunding are based on platform-level evidence from Seedrs (from *Seedrs Portfolio Report (Winter 2023 Edition), a*vailable at: https://v.fastcdn.co/u/4bb5f6e9/64706009-0-Seedrs-PortfolioUpda.pdf), reporting realized returns and failure rates across funded campaigns. Venture capital estimates are drawn from the empirical literature, which documents highly skewed, power-law distributed returns with a high probability of loss (Cochrane, 2005; Kaplan and Schoar, 2005; Hall and Woodward, 2010). Estimates for HCCs are constructed using the proxy-based methodology described in Appendix C and should be interpreted with caution. In particular, HCC returns are inferred from estimated income trajectories rather than directly observed payments and are based on a sample of successfully funded campaigns, which may bias results upward and understate downside risk. The absence of observed negative outcomes implies that the reported probability of loss for HCCs reflects sample limitations rather than true population characteristics. Standard deviation (σ) captures return dispersion, while Sharpe and Sortino ratios are computed using standard definitions, with the Sortino ratio focusing on downside risk. All figures should be interpreted as approximate and illustrative rather than directly comparable across asset classes.