

Financing mechanisms may displace ethical motivations.

An experiment on the effects for the production of social welfare goods.

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Abstract. This paper investigates the complex interplay between motivations and financial incentives in the provision of social welfare goods. Drawing on an experimental study, we examine how the availability of funds and the metrics used to evaluate performance influence the behavior of workers involved in the production process, with a specific focus on imperfect proxies. Our findings reveal that pro-social motivations in welfare production are not only affected by direct incentives targeting workers' remuneration based on performance metrics, but also by the broader institutional setting. Notably, we caution against the potential consequences of implementing contractual mechanisms aimed at financing social welfare service production through speculative finance. Although these mechanisms are conditioned on meeting social impact objectives, they can alter workers' preferences and impede the pursuit of broader social welfare goals. Additionally, our study sheds light on the coherence, or lack thereof, between financing mechanisms and organizational structures and goals. This contributes to a deeper understanding of the intricate relationship between financial incentives and social welfare provision.

KEYWORDS: Experiment; Financing; Intrinsic Motivation; Motivational Crowding-out
Social Welfare Goods

JEL CODES: C91; D82; D91; G24; H42

1. Introduction

Social welfare provision encompasses a wide array of actors, ranging from the State to private commercial providers, nonprofits, and civil society organizations (Anheier and Krlev, 2014). All these entities are an integral part of the delivery of health, education, social, and other services. In recent decades, private (non-governmental) actors are increasingly involved not only as providers of welfare services but also as financiers, in ways that represent a departure from the usual philanthropic or charity financing of foundations and the revenue generation by social enterprises (Phillips and Hebb, 2010).

Several concepts and practices have emerged, all converging on the notion of applying methods and techniques from the for-profit sector to the third sector: philanthrocapitalism (Green and Bishop, 2001), venture philanthropy (Barman, 2016), and impact investment (Nicholls, 2009). The declared aim is to enhance the efficiency and profitability of organizations engaged in development and welfare programs (McGoey, 2014).

These movements have led to an increasing emphasis on the need for effective performance measurement to provide transparency and accountability in how funds are utilized and whether they achieve the intended social goals. Additionally, following the global financial crisis, several investors have shown interest in financing projects with an explicit social purpose, while also connecting the achievement of social goals to monetary profits. In this context, the reliance on metrics is essential to link the attainment of measurable goals to the financial returns of private investors (Dowling, 2016).

The present work is motivated by the awareness that the use of performance metrics to evaluate the quality of social interventions, combined with the use of such indicators for generating financial return for investors, can give rise to substantial issues. For example, Warner (2013) suggested that there is a risk that the private sector may prioritize profit generation over the needs of service recipients; and Edmiston and Nicholls (2018) observed how the private financing of welfare services accompanied by the marketization of social outcomes may compromise service quality due to perverse incentives (Rees et al., 2014; Carter and Whitworth, 2015).

Our main research question concerns the risk that inadequate measurement and financial instruments may undermine the pro-social motivations of the agents involved in social service provision. Given the central role of prosocial motivations in the delivery of social services (Besley and Ghatak, 2005; Wright, 2007; Park and Word, 2012; Word and Park, 2015), this question is pivotal for the appropriate design of effective measurement and financing tools.

We employ an online experiment with participants recruited through Prolific to examine the interaction between measurement reliability and financing methods, and their effects on the behavior of agents engaged in producing goods that emulate key aspects of social welfare services.

Specifically, we provide a stylized setting where the worker's payment is contingent on the quantity of units produced, while the payment for a third-party beneficiary is contingent on their quality. Workers face a trade-off between producing low-quality (LQ) or high-quality (HQ) goods. Our primary objective is to explore whether individuals exhibit pro-social behavior within this context, devoid of explicit incentives. Additionally, we seek to assess the impact of increased available funds. Subsequently, we introduce a third player, the financier, who assesses the worker's

production plan and can contribute to the production costs, being remunerated through variable mechanisms, linking financial revenue to different measures of output.

Our results suggest that pro-social motivations in welfare production may be influenced not only by incentives that directly target workers' remuneration based on performance metrics but also by the overall institutional setting and the way it provides for the remuneration of capital investors conditional on outcome measurement.

In particular, we observe that a significant share of subjects enrolled in the experiment as workers deviate from purely payoff-maximizing behavior in the absence of the financier. Second, financing mechanisms significantly influence worker behavior. With respect to the conditions, in which the financier is not present or her payoff does not depend on workers' performance, in treatments where financiers' payments are tied to the quality of goods produced, workers respond by increasing the production of high-quality goods, indicating a strong alignment between their behavior and the financier's incentives. Conversely, when financiers' payments are based solely on the quantity of goods produced or on an imperfect measure of the quality, we observe a decrease in the number of workers demonstrating pro-social concerns, resulting in a reduction of overall beneficiary welfare. Additionally, workers' beliefs about whether they would be financed correlate with their production choices, particularly in treatments where financiers' payments are contingent on quality.

Understanding the dynamics of incentives and motivations within the production of social welfare goods is critical for designing effective policy and organizational structures. Our results have policy implications that are relevant in particular for social impact finance: if private capital is to be utilized effectively to generate social impact by tying its remuneration to impact measurement, the system functions well under the unrealistic assumption of perfectly measuring quality. This alignment of interests between workers and financiers leads to a positive impact on beneficiaries. However, as is often the case, if imperfect measures must be used or quantity is used as a proxy for quality, the opposite effect occurs. In such cases, workers' choices align with the proxy criterion, sacrificing all the quality they would spontaneously produce. While pro-social motivations can be effectively supported by mission-oriented organizational forms with multi-stakeholder governance, they can be undermined by an excessive reliance on financial and market-linked instruments.

The remainder of the paper is organized in the following way: in *Section 2*, we discuss the main assumptions of the paper and critically review relevant literature on the topic. *Section 3* describes the experimental design, procedures, and hypotheses. *Section 4* presents the results. In *Section 5*, we discuss the potential implications in terms of business ethics and provide the conclusion.

2. Key concepts and relevant literature

Our work draws from three interrelated strands of literature that provide valuable insights in the context of the production of social welfare goods and its financing.

First, examining the interplay between financial incentives and prosocial motivations is essential for understanding how workers in social welfare sectors balance personal profit and the welfare of beneficiaries. This literature highlights the complexity of designing incentive structures that not only drive efficiency but also sustain intrinsic motivations critical for social services.

Second, the role of organizational values and governance mechanisms in shaping motivations and behaviors of workers and stakeholders cannot be overlooked. Social enterprises, with their mission-driven focus and multi-stakeholder governance, offer a unique perspective on how organizational forms can support or hinder pro-social motivations and overall welfare production.

Third, experimental literature on measurement and payment schemes provides empirical evidence on how different financial incentives affect worker behavior, especially in credence goods markets like healthcare and social services. These studies offer nuanced understanding of the impacts of various payment structures, from fee-for-service to capitation, on the quality and quantity of service provision.

By integrating insights from these three strands of literature, our work aims to contribute to a more comprehensive understanding of how incentives, organizational structures, and performance metrics interplay in the production of social welfare goods.

2.1 Incentives and prosocial motivations

It is now widely accepted that workers respond to financial incentives in various ways, with reactions varying depending on the nature of the work and the payment structure (Lazear, 2018). Particularly noteworthy is the differing impact of rewards on performance in private (for-profit) versus pro-social tasks (Ashraf and Bandiera, 2018; Besley and Ghatak, 2018).

The design of payment schemes in work environments becomes particularly complex when workers' choices and efforts are directed toward enhancing the welfare of a third party, such as a beneficiary, as is often the case in public service, the health sector, and social services in general. In such scenarios, workers must navigate a delicate trade-off between personal profit and the welfare of the beneficiary (Arrow, 1963). Their behavior may reflect a mix of *intrinsic*, *extrinsic* and *reputational* motivations (Bénabou and Tirole, 2006), each of which may be differently influenced by various incentive schemes (Kamenica, 2012).

The existence of pro-social motivations in agents involved in the provision of social welfare goods or services (e.g., doctors, nurses, teachers and social workers) is essential in contexts characterized by high information asymmetry and a significant credence component. It has been observed that workers who deliver social services are often characterized by a certain degree of prosocial motivation (Word and Park, 2015; Park and Word, 2012; Wright, 2007; Besley and Ghatak, 2005; Prendergast, 2007; Brehm and Gates, 1999; Wilson, 1989), and this contributes to the effectiveness and efficiency of the production of welfare goods and services (see also: Hansmann, 1980; Rose-Ackerman, 1986; Borzaga, 2013; Grimalda and Sacconi, 2005; Sacconi and Faillo, 2010; Prysmakova, 2021).

Notwithstanding the importance of this motivation, several mechanisms have been adopted in social service provision to incentivize workers. Within a wider approach of performance-based funding in public services (including pay-for-performance and pay-by-results schemes), a quasi-market logic has been proposed in the delivery of welfare goods (Edmiston & Nicholls, 2018)

However, a possible tension arises from the use of financial incentives for workers involved in pro-social tasks (Lazear, 2018; Ashraf and Bandiera, 2018; Besley and Ghatak, 2018). Several

studies have identified the effects of different reward systems on the behavior of physicians (Brosig-Koch et al., 2016; Godager et al., 2016; Green, 2014; Hennig-Schmidt et al., 2011), teachers (Duflo et al., 2012, 2015) and public servants (Ashraf et al., 2014; Corduneanu et al., 2020) with mixed results. These studies show how pay-for-performance schemes may hamper altruistic behavior or intrinsic motivations, resulting in a more profit-oriented behavior, or enhancing efficiency concerns and other effects (Carpenter and Gong, 2016; Cassar, 2018; Charness et al., 2016; Imas, 2014; Tonin and Vlassopoulos, 2010, 2015).

2.2 Organizational values and the influence on motivations and behavior

Another aspect that deserves attention concerns the governance mechanisms used to align the incentives of different stakeholders. For example, the organizational form of social enterprises has proven efficient in producing social welfare goods through a unique governance structure that reinforces the pro-social motivations of those who contribute capital and work. A key element of this governance model is the idea of a multi-stakeholder impartial agreement, which provides the organization with a perspective of social justice and defines objectives (the so-called ‘social mission’) beyond profit. This includes the effort to distribute benefits and the surplus created by organizational activities to subjects other than paying owners or clients, such as vulnerable beneficiaries, and fosters a democratic governance form (Grimalda and Sacconi, 2005; Borzaga et al., 2008; Borzaga, 2013; Kannampuzha & Hockerts, 2019).

Although there is a consensus that the core mission of social enterprises is the explicit aim to benefit the community or create social value and distributing it according to some principle of justice (Defourny and Nyssens, 2010), conflicts can arise within non-profit organizations due to differing logics of actions and objective functions (Bull et al., 2018). Tensions between multiple objective functions are also present within organizations, giving rise to sustainability tensions (Hahn et al., 2018), and it has been argued that conflicts among various objective functions are inevitable within corporate sustainability (Haffar and Searcy, 2019; Hahn et al., 2015; Van der Byl and Slawinski, 2015).

Tensions around objective functions may be particularly relevant also in inter-organizational contexts, when different actors interact (Agrawal and Hockerts, 2019; Moran and Ward-Christie, 2022). An example is given by *impact investing* (defined as “investing with the intention to generate positive, measurable social and environmental impact alongside a financial return”, GIIN 2021) where several actors are involved: investors, fund managers, investees, and beneficiaries (Hockerts et al., 2022).

When considering the production of social welfare goods, a fundamental question arises regarding how actors manage multiple, sometimes conflicting objectives that range from profit creation to fostering positive social impact (Hockerts and Searcy, 2023). In contexts marked by the coexistence of social and economic logics, the utilization of financial incentives often raises concerns about the potential crowding out of intrinsic, pro-social, or ethical motivations (Frey, 1997; Bowles, 2008), while in the absence of conflicting incentives, these motivations may support compliance with the organizational mission (Grimalda and Sacconi, 2005; Faillo et al., 2015).

Furthermore, given that human cognitive and motivational processes are influenced by institutional systems (Lindenberg, 2017), it is imperative to explore how motivations are shaped not

only by individual incentives but also by the organizational structure, governance systems, and forms of remuneration adopted by various actors involved. Particularly noteworthy is the role of ethical values embedded within specific institutional frameworks, which can significantly influence participant preferences. Through mechanisms such as mission statements, organizational culture, and operational practices, organizations implicitly or explicitly promote particular values (Chen et al., 2013).

2.3 Related experimental literature on measurement and payment schemes

The experimental method has been used to study the effects of different payment schemes on physicians' behavior in the provision of medical services, under controlled laboratory conditions. A systematic review is offered by Finocchiaro Castro et al. (2024).

The design by Hennig-Schmidt et al. (2011) has been the first one introduced to study how physicians' treatment decisions are affected by payment systems. In their experiments, participants decide on the quantity of medical services (from 0 to 10) for patient types with abstract illnesses. The benefit for patients is maximized at a given quantity that depends on their illness type. Payments for physicians can take two forms: under capitation (CAP), they receive a lump sum per patient, while under fee-for-service (FFS) they receive a fee for each unit of medical services provided. Profits vary across illnesses in FFS because payment differs, and costs are kept constant. In CAP, profit is constant across illnesses. The physician gets information on her payment, costs and profit, as well as on the patient's benefit for each quantity from 0 to 10. Patients are not present in the experiment, but physicians' quantity choices have consequences for real patients in terms of money transferred to a charity hospital. The main result is that physicians overtreat patients by providing more services under fee-for-service, and undertreat them under capitation; their choice is also influenced by the patients' health benefits.

Green (2014) proposes a different design entailing a real-effort task to study the impact of payment structures on physicians behavior, where participants are asked to correct spelling mistakes on behalf of others.

Lagarde and Blaauw (2017) propose a real effort task framed in a medical context: participants have to type blood test results from long or short laboratory test reports and their performance can vary both in terms of quantity and quality of output.

Karunadasa et al. (2023) use a controlled laboratory setting to study the impact of different payment systems on supplier-induced demand in credence goods markets, specifically aiming to identify the effect payment systems, mainly fee-for-service and salary, have on the quantity and the quality of care provided by experts. They investigate arguments regarding responses to two payment types—salary and fee-for-service.

Similarly, we focus on the quality-quantity tradeoff. The novelty of our paper is to consider the indirect effect that incentives and performance metrics designed to repay investors and fund managers may have on workers, even when their payments are not contingent on performance.

To our knowledge, the only experimental works that have studied a similar question are Oxholm et al. (2021), who introduce resource constraints in a context where participants are asked to make decisions about the allocation of health care services across fictitious patients, and Reif et al.

(2020) who extend the physician decision problem by adding an insurer that finances medical service provision.

2.4 The interplay between incentives and imprecise impact measurement

In our study we address two important additional aspects. First, we consider how motivations are affected by incentives that are not directly edged at workers, but that might impact them indirectly by means of obtaining financing. Second, we are interested in contexts where outcomes and impacts are *difficult to measure* (Besley and Ghatak, 2018).

While typical pay-for-performance schemes are connected to targets that workers need to achieve in order to obtain a personal gain or bonus, we model situations in which reaching a target has a direct effect on the remuneration of a third party, the financier. Since financiers have the choice to give funds to the worker who best accomplishes their objectives, there is only an indirect influence on the worker.

Lohmann et al. (2016) discuss how performance-based financing (PBF) schemes, used in health systems, may influence health workers' motivational structures, mindsets, affect, and behavior, highlighting potential side effects on workers' motivations, depending on the specific design, implementation, and results of a particular intervention and on health workers' perceptions and evaluations of it. In addition to the tradeoff between personal gain and the beneficiaries' benefit, workers may also face a tension between the beneficiaries' welfare and their financier's interests, a problem that Green (2014) discusses with reference to the healthcare industry and labels as the 'dual principal agent relationship', where two principals (the physician's employer and the patient) interact with a single agent (the physician).

In our case, the investee (or worker) faces a trade-off between serving the interest of the beneficiary (pro-social attitude or behavior) and satisfy the financier (representing either a fund manager or an investor). This captures some key issues related to use of social impact finance instruments, that are conceived as investments linked to measurable social objectives capable, at the same time, of generating an economic return for investors. In fact, measuring the outcomes of welfare interventions in a quantifiable manner can be challenging. Addressing multifaceted social issues like poverty, healthcare, education, and homelessness implies offering goods and services characterized by a significant credence component and which affect the welfare of recipients who may not be paying consumers. Such goods and services generate consequences for the beneficiaries' welfare which involve qualitative aspects that are hard to quantify, such as improvements in quality of life or increased social inclusion. Performance metrics might incentivize service providers to focus on easily measurable outcomes at the expense of more complex, but crucial, aspects of social well-being. This can lead to neglect of less measurable but essential services.

3. Experimental design and procedures

3.1 Overview of the experiment

Our experimental setup aims to represent the production of social welfare goods and services, which include goods and services with significant social components such as education, healthcare,

job guidance and training, and the provision of food and shelter. Several actors are involved in this process, and we focus on the key players identified by Hockerts et al. (2022): investors, fund managers, investees, and beneficiaries.

Specifically, we recreate a stylized interaction environment where the investors are impersonated by the *researchers*: they represent the original source of invested capital, mimicking wealthy individuals, foundations, pension funds, public investment vehicles, or crowdfunding initiatives.

Participants acting as *financiers* represent fund managers, who manage the capital of investors, decide which investments to include in the portfolio, and receive a management fee for their contributions.

Participants portraying *workers* embody the investees, responsible for deciding on the production of social welfare goods. In the remainder of this work, we will refer to the worker as ‘he’ and the financier as ‘she’.

Ultimately, the goods we consider have effects on parties who do not take part in a transaction: we call them *beneficiaries*, since they benefit from the production of such goods, although they do not necessarily pay for them; consequently, alternative sources of financing are needed.

An important characteristic of this setting is the potential high level of information asymmetry and knowledge incompleteness. While the worker always knows the quality of the goods and services produced, neither the beneficiaries nor other actors, such as the financiers, can observe and measure their quality. We assume that the workers choose the quality of the goods and services they produce, which corresponds to high or low (monetary) benefits for the beneficiaries and is associated with high or low production costs, respectively. Specifically, the producers face a trade-off between high-quality/high-benefit/high-cost goods and low-quality/low-benefit/low-cost goods.

A typical instrument for evaluating interventions effectively is given by the ‘results chain’, also known as ‘logical framework’ or ‘logic model’ that depicts the logical sequence of inputs, activities, outputs, outcomes, and impacts of a program or project (Ebrahim and Rangan, 2010, Frechtling, 2015; Hatry, 2006). The trend in performance measurement involves a shift from the early stages (inputs, activities) to the final stages, through “outcome measurement” or “impact evaluation”.

While this shift allows for measuring what really matters, it is nevertheless necessary to be aware that measurement capacity diminishes, and metrics lose content, even and especially for social or welfare properties, where we have a very high asymmetry of information and incompleteness of knowledge about unforeseen events. Therefore, while measuring towards the end in the logic model allows us to get closer to what is most valuable in social interventions, at the same time this can lead to measuring the wrong things.

As mentioned above, workers such as teachers, doctors, or front-line workers in social services have the power to decide how to use the resources available within an organization – typically a public institution or a social enterprise. These resources constitute the *inputs* of the production process, including financial resources, material assets, equipment, technology, and space.

Our simplification entails an organization with a single employee (the worker) who is entrusted with deciding on a production plan. The production plan involves choosing the type of goods or services to produce. Given a fixed amount of resources, the worker must decide whether to produce several cheap and low-quality goods, or a smaller number of costly high-quality goods. Different goods affect the resulting monetary payoffs of the other players involved in the game. In particular, the higher the quality of the goods, the higher the welfare generated for beneficiaries who consume the goods.

A typical example might be a doctor's choice between offering several superficial treatments to a patient or conducting a small number of thorough and careful investigations. If the doctor is paid based on the number of treatments provided, it would be more profitable to give many treatments. However, it might be more beneficial for the patient to spend more resources on one or a few in-depth treatments. Another example could be the provision of meals in a soup kitchen. Given a fixed amount of resources and a fixed number of guests, the worker can choose to prepare an expensive full meal for each guest, prioritizing quality. Alternatively, the worker can serve a greater number of snacks and packed lunches, resulting in a wider offering of meals but potentially compromising their overall nutritional content for the same target group.

In summary, producing high-quality goods costs more, while producing low-quality goods costs less. With a given amount of initial resources, the worker must choose between producing fewer high-quality goods or more low-quality goods.

The organization (the worker) that provides the goods or services receives a fixed payment for each unit delivered. Examples include tuition fees, fees for medical visits, reimbursement for training programs, or vouchers for soup kitchen services. These payments can be made by the recipients themselves at a fixed price or by public agencies.

What is crucial here is that, typically, the payment for the worker cannot be conditioned on the real quality of the service or product that he produces but only on the number of *outputs*. This is due to the well-known issue of information asymmetry in the production of social welfare goods, where the quality cannot be observed from the outside. Consequently, the market price is the same for each unit of good, whether low- or high-quality. The beneficiaries, however, profit from the quality of the goods or services, and their payoffs are referred to as *outcomes*, which are usually defined in terms of changes in the lives of beneficiaries.

In these situations, *outputs* of production are the goods or services produced, for example the number of meals served, of people treated, trained or educated. The *outcomes*, on the other hand, are the effects on the beneficiaries' lives, such as improved quality of life, health, educational attainments in the medium and long term, and similar benefits.

In particular, we follow Besley and Ghatak (2017) in assuming that the goods or services produced generate two types of consequences: *an economic/financial return*, which serves as a proxy for the market value of the product and translates into payoffs for the worker, and *a social component*, which translates into a payoff for the beneficiary. The beneficiary has no active role in the experiment and can only earn based on the worker's choice. Although these payoffs are expressed in points and converted into real money, they represent a monetary equivalent for the benefits from the provision of social services, such as education, medical services, or job guidance. The magnitude of this payoff

critically depends on the quality of the goods or services, which usually requires a higher effort from the worker or a greater expenditure of funds.

Given this assumption, it becomes evident that, in the case of purely selfish workers, the interests of the worker and the beneficiary are conflicting: the worker receives a higher wage if they produce more goods (focusing on quantity), while the beneficiary receives a higher benefit if they receive better goods (focusing on quality). Although we construe this conflict as a mere comparison of monetary payoffs, similar to a dictator game (Camerer, 2003; Forsythe et al., 1994), our experimental situations aim to represent a tension involving the workers' efforts and the social impact generated on beneficiaries. This impact usually depends not only on the number of goods received but also on their quality and other characteristics that we do not model in this design, such as external influences linked to environmental and contextual factors, and the 'individual ability to benefit' from a given resource (Konow, 2003; Sen, 1980).

In this setting, we do not consider several other features of social services. For example, we do not take into account multidimensional outputs but simply assume that benefits increase with the number of goods, with high-quality goods providing much greater welfare for the beneficiary¹. Additionally, we do not account for the uncertainty of social outcomes, assuming instead that every good produced reaches the recipient and enhances their welfare without risks of failure related to environmental elements or behavioral responses by the beneficiaries.

3.2 Treatment Variations

Given this basic interaction between a worker and a beneficiary, we aim to understand how the way resources for production are provided can affect workers' behavior, and how the providers of resources assess workers' decisions and decide whether to financially support the production or not.

We begin by considering a situation in which the worker's endowment is fixed and not conditioned by his production choices. This is our baseline condition, which we call *Baseline 20*. In this scenario, we expect to observe a range of behaviors, from pure self-interest to pro-social and other-regarding actions.

Next, we test the effect of increasing the worker's endowment by moving to the condition *Baseline 30*. If we observe that workers are willing to produce higher quality goods in this condition, we might conclude that granting more funds to those producing welfare goods induces them to focus more on quality. Conversely, this would suggest that underpaid social workers tend to be greedier and produce worse outcomes for beneficiaries.

A further, and crucial, aspect of our design concerns the introduction of a third player, the *financier*, whose monetary payoff depends on the choice of the worker through a mechanism that changes across treatments. The payoff for the financier may be independent of the worker's production plan (*Fixed* treatment) or it may depend on what the beneficiary actually receives (*Quality* treatment).

First, we aim to understand the effect of the third player on workers' behaviors. Each worker knows that he is going to be observed and evaluated by a financier, who can choose to contribute or

not to the worker's production costs. In the *Fixed* treatment, financiers are rewarded with a fixed amount per worker evaluated, regardless of the worker's output.

Second, we introduce a condition where the remuneration for financiers is contingent on the quality produced by the worker for the beneficiary (*Quality* treatment).

It should be clear from what we have discussed so far that in the real world, the benefits for the beneficiary, which significantly depend on the worker's choices, cannot be easily observed and measured by an external observer, and sometimes not even by the beneficiary themselves. A financier interested in funding workers who generate a positive social impact will necessarily need to rely on some proxy of this impact. Therefore, we introduce two additional treatments where the return for the financier depends on an imprecise measure of the impact on beneficiaries: either the total number of goods produced (*Quantity* treatment) or the attainment of a minimum threshold of quality (*Threshold* treatment).

3.3 Experimental setting

The game begins with the worker's choice. Each worker is matched with one beneficiary. The *inputs* for the worker consist of an endowment of funds, which in this experiment is 20 points (with 1 point equivalent to £0.10). The worker must choose a production plan that includes a combination of two types of goods: low-quality (LQ) goods and high-quality (HQ) goods. This choice exemplifies the *activity* of the worker.

'LQ goods' are low-quality goods that cost less to be produced (1 point each) and generate small benefits for the beneficiary (0.1 point each). 'HQ goods' are high-quality goods that cost more to be produced (2 points each) and generate significant benefits for the beneficiary (1 point each). In the experiment, workers were presented the choice between 'Type 1' and 'Type 2' goods, respectively corresponding to LQ and HQ, in order to maintain a neutral description.

The worker must spend all 20 points on production and receives 1 point for each good produced, regardless of its type. The number of goods produced represents the *outputs* of the process, while the points earned by the worker represent the *outcomes*.

In the experiment, the worker selects a production plan from a list of possibilities shown in figure 1. The worker clicks on the chosen combination, which displays the corresponding points for himself, the beneficiary, and the financier (if the treatment includes financiers).

	COMBINATIONS (n. of goods)		PAYMENTS (points)	
	TYPE 1 GOODS	TYPE 2 GOODS	YOU	BENEFICIARY
<input type="checkbox"/>	20	0	20	2
<input type="checkbox"/>	18	1	19	2.8
<input type="checkbox"/>	16	2	18	3.6
<input type="checkbox"/>	14	3	17	4.4
<input type="checkbox"/>	12	4	16	5.2
<input type="checkbox"/>	10	5	15	6
<input type="checkbox"/>	8	6	14	6.8
<input type="checkbox"/>	6	7	13	7.6
<input type="checkbox"/>	4	8	12	8.4
<input type="checkbox"/>	2	9	11	9.2
<input type="checkbox"/>	0	10	10	10

Figure 1 - The production possibilities of the worker (TYPE 1 correspond to LQ goods; TYPE 2 correspond to HQ goods).

This setup allows us to observe how workers balance the trade-off between producing high-quality goods that benefit the beneficiaries more and low-quality goods that maximize their own earnings. The various treatments test how different incentive structures and the presence of financiers influence the workers' production choices.

In the two baseline conditions (*Baseline 20* and *Baseline 30*), the game ends after the worker's choice, and the worker and the beneficiary are paid accordingly (see figure 2)².

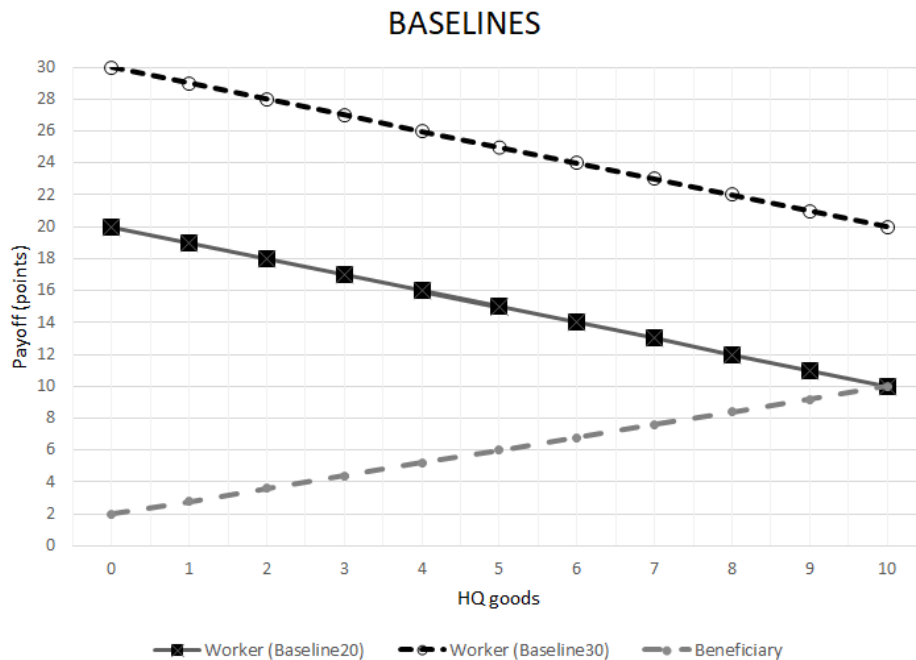


Figure 2 - Worker's and Beneficiary's payoffs (Baseline 20 and Baseline 30).

In the treatments, a third subject, the *financier*, observes the worker's production choice and can decide whether to contribute to pay the production costs with 10 points. Each financier is matched with five workers; while each worker produces goods for only one beneficiary (see figure 2).³

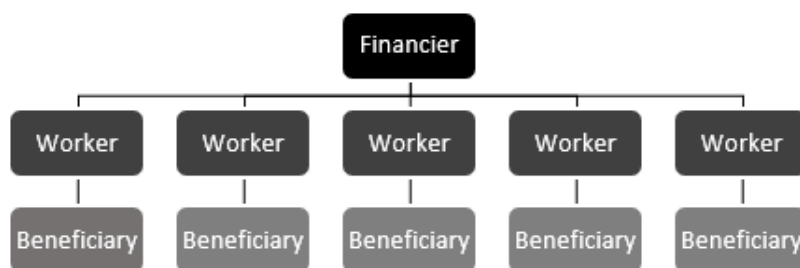


Figure 3 - The matching between financiers, workers and beneficiaries.

The first mover is the worker, who makes his choice as in the baselines, knowing the payoffs that each possible combination of goods generates for himself, the beneficiary, and the financier.

The second mover is the financier, who observes the production plans chosen by five workers and then decides whether to finance each of them by transferring 10 points to the worker. She is also asked to evaluate each worker's choice on a scale from 0 (not at all) to 5 (completely), indicating how appropriate she judges the worker's choice to be.

The financier draws financial resources from a fund of 50 points assigned by the researcher. Points not used for financing workers return to the researcher, so the financing decision is not costly for the financier. There is no competition between workers for access to additional financial resources since the financier has exactly 50 points at her disposal, which is enough to finance all five workers she is evaluating. Since financing reduces the production costs by 10 points, a worker who is financed gains 10 points in addition to his payoff derived from the production of goods.

The financier is paid for each worker evaluated. If she decides not to finance a worker, she earns 12 points. This payoff represents the result of investing the 10 points of the fund in another activity that gives a sure and fixed return. If she decides to finance a worker, the financier is paid according to a rule that changes across treatments, mimicking different payment schemes.

In the *Fixed* treatment, the financier receives 12 points for each worker she decides to finance, which is the same as her payoff if she refuses to finance. Figure 4 illustrates the payoffs for all players based on the quantity of HQ goods produced.

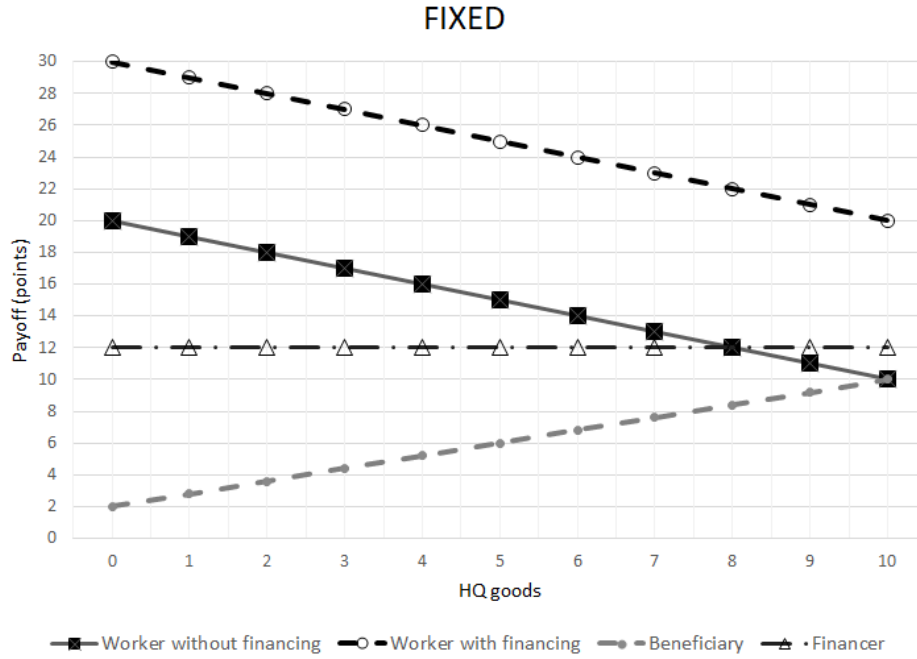


Figure 4 - Worker's, Financier's and Beneficiary's payoffs (Fixed).

In the *Quality* treatment, if the financier decides to finance a worker, she receives 0.2 points for each LQ (Low-Quality) good and 2 points for each HQ (High-Quality) good produced by that worker. This allows the financier to increase her payment by financing workers who generate higher benefits for the beneficiaries. Returns for financing are based on actual outcomes, representing an ideal mechanism that connects investor repayment to the real social impact, with perfect measurement of beneficiaries' welfare and a precise match with the financier's gains. Figure 5 provides a summary of the payoffs for this treatment.

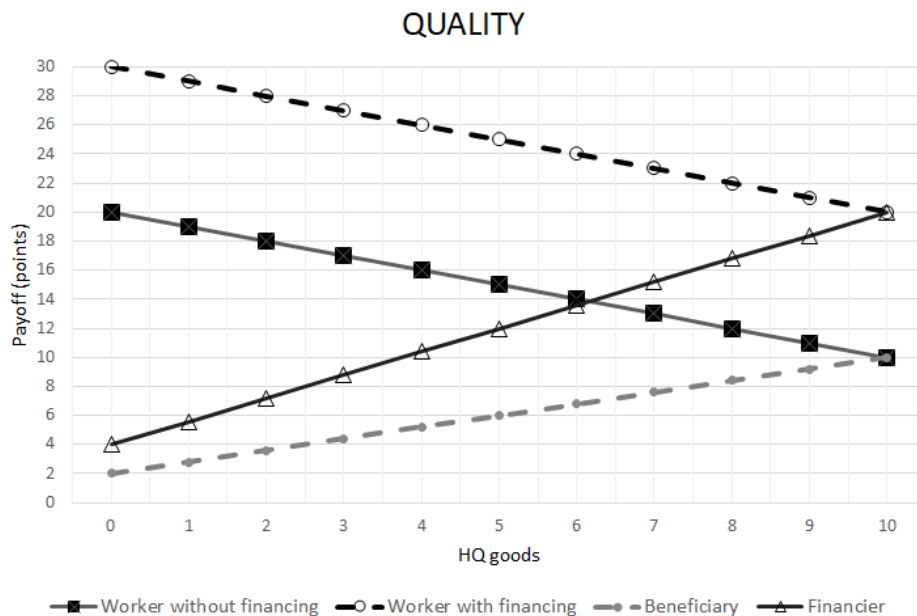


Figure 5 - Worker's, Financier's and Beneficiary's payoffs (Quality).

In the *Quantity* treatment, if the financier decides to finance a worker, she receives 0.8 points for each good produced, regardless of the quality. Therefore, she gets higher payoffs when more goods are produced. This financial scheme repays the investor based on the most easily observable result of the production process: the outputs (number of medical services, meals, teaching hours, enrolled students). The corresponding payoffs are depicted in figure 6.

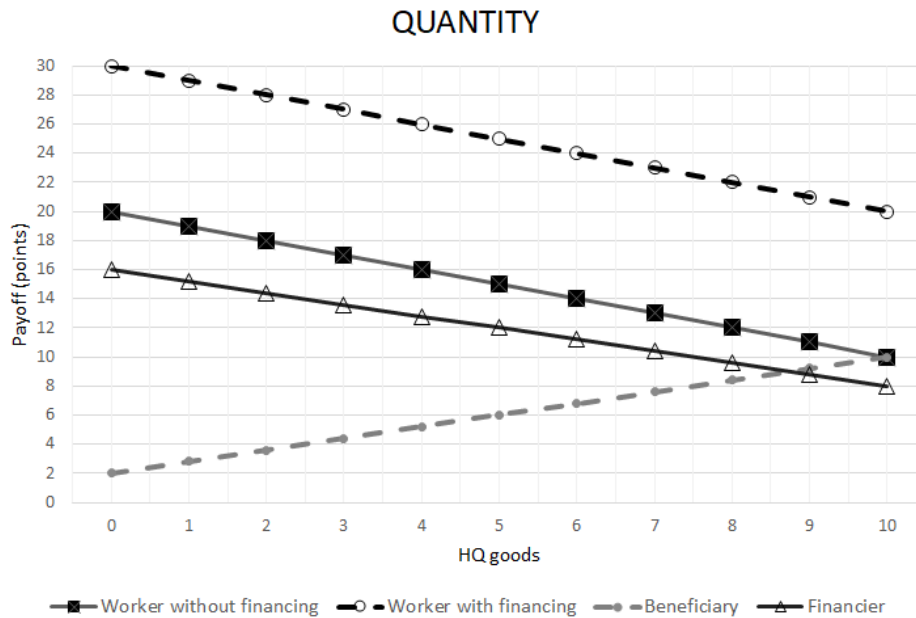


Figure 6 - Worker's, Financier's and Beneficiary's payoffs (Quantity).

In the *Threshold* treatment, if the financier decides to finance a worker, her payment is based on an imperfect measure of quality. The financier receives 5.6 points if the worker produces 0, 1, or 2 HQ goods, and 14.4 points if the worker produces more than 3 HQ goods. These payment amounts are derived from the average payments received by the financier in the *Quality* treatment: 5.6 points for up to 3 HQ goods and 14.4 points for more than 3 HQ goods.

Here, we assume that the external observer can only verify whether a minimum performance threshold is met. The financier can determine if the worker has produced above or below a threshold of 3 HQ goods, indicating the presence of measurement costs. For example, a service provider might operate on 100 patients, but the quality inspector stops checking after interviewing 30 of them; or a social enterprise might run 10 soup kitchens, but the inspector ceases visits after observing 3 that work well.

The relevant payoffs for the *Threshold* treatment are illustrated in figure 7.

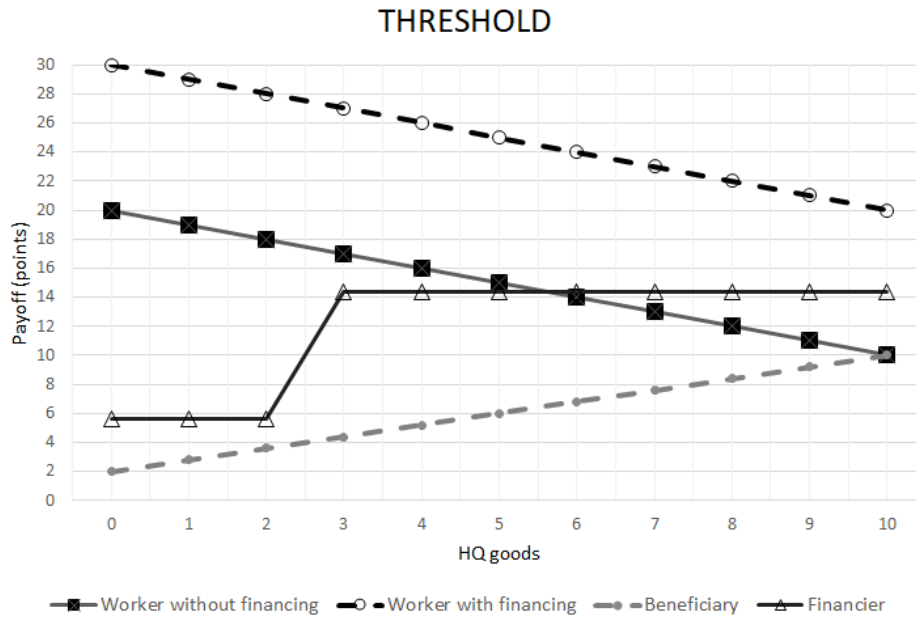


Figure 7 - Worker's, Financier's and Beneficiary's payoffs (Threshold)

In all treatments, payments are structured so that the financier receives the same payment from *financing* and *not financing* when the worker produces a balanced mix of goods (10 LQ and 5 HQ goods), except in the final treatment.

The payoff for the beneficiaries is certain regardless of the financier's decision and depends solely on the production choice of the connected worker. In the experiment, we also ask each worker to predict whether the financier will contribute to his production plan. We incentivize accurate predictions by rewarding the worker with 2 extra experimental points if his belief matches the financier's actual choice. Similarly, we ask each beneficiary to predict the worker's production choice and the financier's subsequent decision to finance or not finance the worker. Beneficiaries are also incentivized with 2 extra points for each correct guess.

Figure 8 illustrates the experimental design, highlighting the links between the experimental conditions and the factors that are manipulated by moving from one condition to another.

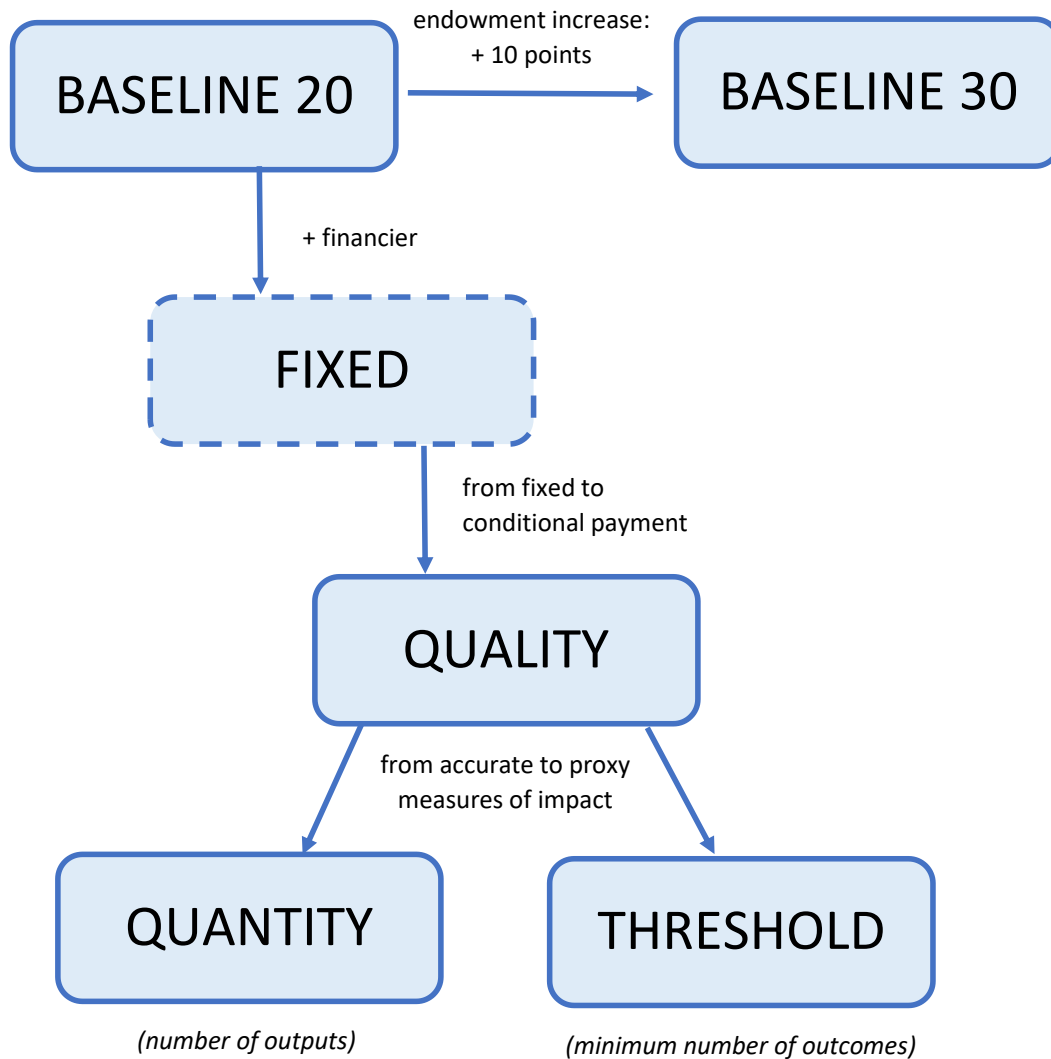


Figure 8 - Experimental Design: baseline conditions and treatments.

3.4 Procedures

The experimental sessions were coded using the open-source software for economic experiments, oTree (Chen et al., 2016). They were conducted using Prolific, a UK-based platform for online experiments (Palan and Schitter, 2017)⁴. The sessions took place between June 2020 and January 2021.

To increase control over the recruited subjects, we restricted the potential pool to participants who self-reported proficiency in English. Additionally, we assessed comprehension of the instructions through several control questions, including two attention checks to ensure participants thoroughly read the instructions and did not randomly guess the answers. Subjects who made three or more mistakes on these control questions were excluded from the dataset and bonus payments, despite completing the study.

The average individual payment was £3.28 for workers, £6.74 for financiers, and £1.34 for beneficiaries, aligning with the hourly payment guidelines prescribed by Prolific. For each experimental condition, 100 subjects were enrolled as workers and 100 as beneficiaries. In each treatment involving external financing, 20 subjects were recruited as financiers. In total, 1280 subjects participated in the experiment. Of these, 38% were female, 56% were students, and the average age was 26.18 years. No subject participated in more than one treatment.

3.5 Hypotheses

Our main interest is to understand whether the size of the endowment, the way in which the production of goods is financed, and – when present – the way in which the financier is remunerated have an impact on the decision of workers to produce HQ versus LQ goods.

A natural way to proceed is to start with what we should expect from purely self-interested agents. On the other side, on the basis on the evidence on pro-social behavior described in the experimental economics literature, we should also expect to observe some participants who are willing to give up some part of their own payment in order to generate benefits for the others. These pro-social motivations might themselves respond in different ways to the different financing mechanisms that are mimicked by our treatments.

We begin by observing the behavior of workers in a first condition (*Baseline 20*), where they can choose to produce between 0 and 10 HQ goods. This ranges from producing 0 HQ goods, which gives them the highest payoff (20 points) while totally penalizing the beneficiary (who would only receive 2 points), up to producing 10 HQ goods, which ensures a fair and equitable outcome (10 points for the worker and 10 points for the beneficiary). In this situation, a selfish payoff maximizer should choose to produce only LQ goods, that is, 0 HQ goods, inducing the lowest payment for the beneficiaries (see figure 2).

Then, the null hypothesis that we want to test, which assumes that workers are purely selfish, is the following:

H0a: In the Baseline 20 workers choose to produce 0 HQ goods.

The falsification of this hypothesis would imply the existence of workers with pro-social motivations, who decide to produce more than 0 HQ goods.

Second, we observe the same choice in a slightly modified context (*Baseline 30*) where workers receive additional funds (10 points more) as a contribution to costs: production becomes cheaper, and the worker can earn more. Again, in this case, a payoff maximizer should choose to produce only LQ goods (corresponding to zero HQ, see figure 2). Our second null hypothesis:

H0b: The behavior of workers in the Baseline 30 is not different from that observed in the Baseline 20: workers choose to produce 0 HQ goods.

In the case in which workers diverge from this assumption and display pro-social motivations, we are interested in observing whether there is a sort of “income effect” with workers willing to produce even more HQ goods compared to *Baseline 20*.

Introducing treatments with the financier, our questions concern how changes in the financing mechanisms influence workers' decisions compared to the baselines.

In the first of these treatments (*Fixed*) we investigate whether there is an effect on workers' behavior from the mere fact of being observed and assessed by another person who can contribute to costs. In the *Fixed* treatment, the financier receives 12 points for each worker, regardless of her decision to finance them or not. If the financier does not care about the beneficiary's payoff, she should be indifferent between financing and not financing, as she has no external incentive in terms of her own payoff to give or refuse financing to a worker (the flat line in figure 4). However, if the financier cares about the beneficiary's payoff, the likelihood of financing increases with the number of HQ goods produced.

Also in this case, a selfish worker would maximize his payoff by producing 0 HQ goods, regardless of his beliefs about the financier's choice. Therefore, our null hypothesis is the following:

H0c: In the Fixed treatment, since financiers should be indifferent between financing and not financing, workers produce 0 HQ goods.

Workers with pro-social motivations should again produce more than 0 HQ goods.

In the following treatment (*Quality*), workers should consider that the financier's payoff increases with the payoff for the beneficiary. Selfish financiers prefer to finance a worker when he produces more than 5 HQ, are indifferent between financing and not financing a worker who produces exactly 5 HQ goods, and prefer not to finance when the worker produces less than 5 HQ. If the financier cares about the beneficiary's payoff, the likelihood of financing increases with the number of HQ goods produced. Given this, a selfish worker will prefer to produce 6 HQ goods to induce the financier to choose finance, and maximize his payoff (see figure 5). The null hypothesis follows:

H0d: In the Quality treatment, workers produce 6 HQ goods, obtaining funding from the financiers.

A worker driven by pro-social motivations, however, should derive motivation from the well-being of the beneficiary, maintaining indifference towards the financier's decisions that solely impact the worker's remuneration.

In the next two treatments, we add two conditions mimicking situations in which the financier's payments are based only on proxy measures of quality.

In one case (*Quantity*), the financier's payment depends solely on the total number of goods produced, irrespective of their quality and impact on the beneficiary. This means that the financier's payoff is maximized when the worker produces 20 LQ goods (0 HQ goods). Selfish workers' and financiers' interests are perfectly aligned, as they both maximize their payoff when 0 HQ goods are produced (see figure 6). We put forward the following null hypothesis:

H0e: In the Quantity treatment, workers produce 0 HQ goods, obtaining funding from the financiers.

Again, workers with pro-social motivations should not take into account the reaction of the financier, producing more than 0 HQ goods. A similar outcome could be observed in the case of

selfish workers who expect to face a pro-social financier who wants to enforce the production of HQ goods for the benefit of the beneficiary, at the expense of both the worker and the financier herself.

In the last treatment (*Threshold*), a selfish financier prefers to finance workers who produce at least 3 HQ goods, while she prefers not to finance when the worker produces 0,1 or 2 HQ goods; knowing that, the payoff maximiser worker decides to produce exactly 3 HQ goods (see figure 7).

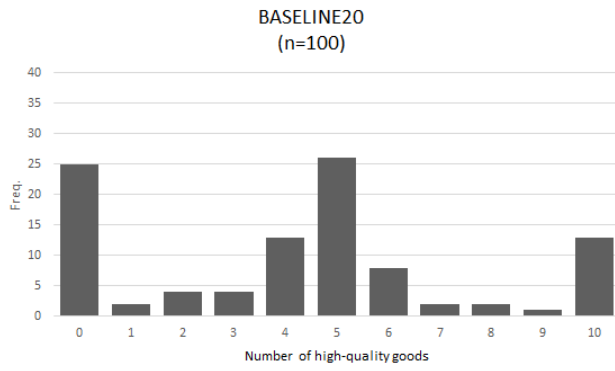
H0f: In the Threshold treatment, workers produce 3 HQ goods, obtaining funding from the financiers.

Also in this case, workers with pro-social motivations should not consider the reaction of the financier. In the case of selfish workers, even if they expect to face a pro-social financier, their choice will be to produce exactly 3 HQ goods since higher production cannot be observed.

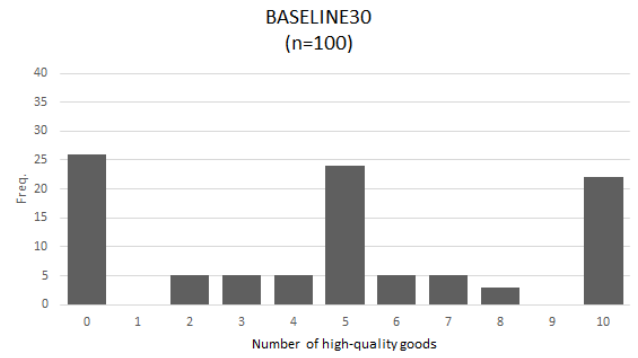
4. Results

We start by examining the choices of the workers, focusing on the differences in their production plans, and their beliefs about being financed. We then move to the analysis of the financiers' decisions⁵.

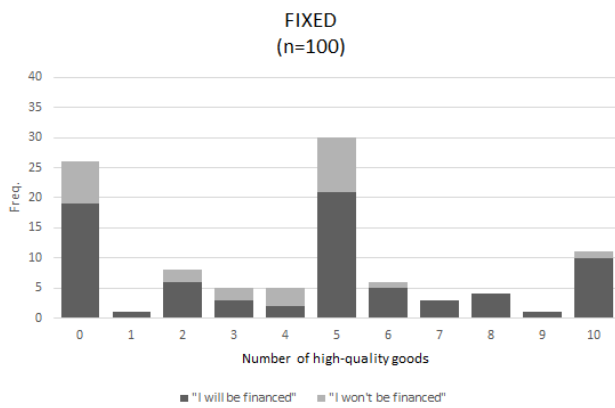
Figure 9 reports the distributions of the number of HQ goods produced by workers across treatments. The figure also shows the workers' beliefs about whether they will be financed: for each quantity of HQ goods produced, the dark grey portion of the bar represents workers who believe they will receive financing, while the light grey portion represents workers who do not believe they will receive financing.



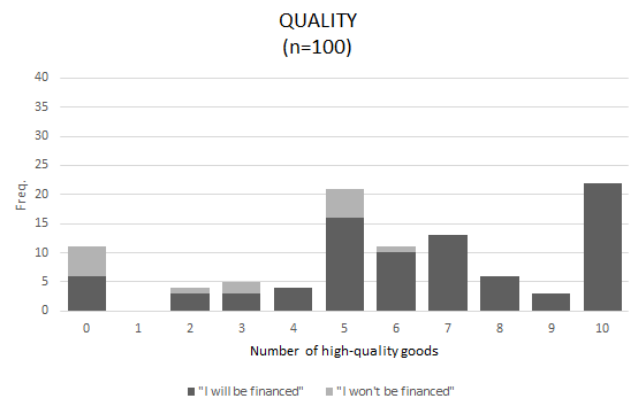
(a)



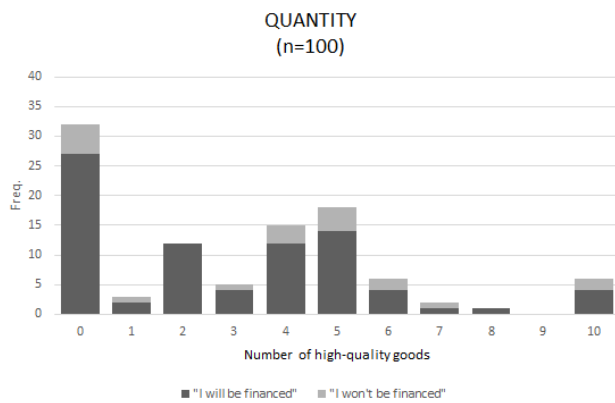
(b)



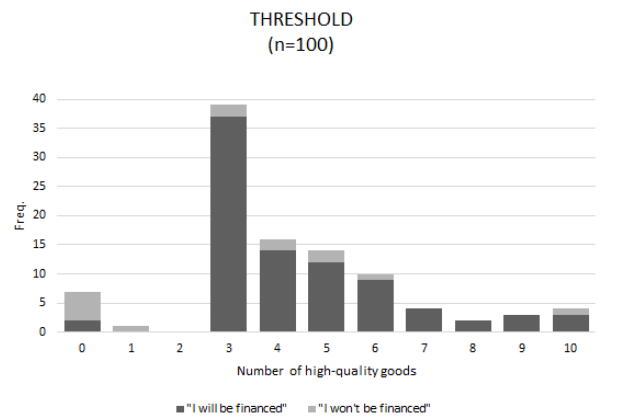
(c)



(d)



(e)



(f)

Figure 9 - Distributions of the number of HQ goods produced by workers across treatments.

4.1 Workers' choices

Result 1: The percentages of workers whose choices perfectly align with the assumption of pure self-interest, which forms the basis of our null hypotheses, are as follows:

- a. In the Baseline 20, 25% choose to produce 0 HQ goods.*
- b. In the Baseline 30, 26% choose to produce 0 HQ goods.*
- c. In the Fixed, 26% choose to produce 0 HQ goods.*
- d. In the Quality, 11% choose to produce 6 HQ goods.*
- e. In the Quantity, 32% choose to produce 0 HQ goods.*
- f. In the Threshold, 39% choose to produce 3 HQ goods.*

However, the high heterogeneity in the choices of the workers observed in all the experimental conditions demands a more thorough examination, from which further results can be put forward.

Looking at the average number of HQ goods, the highest value is observed in the *Quality* treatment (figure 10). In this treatment, workers produced, on average, significantly more HQ goods than in *Quantity* (Wilcoxon rank-sum - Mann-Whitney test⁶: $z = 6.33$, $p < 0.01$), in the *Fixed* ($z = 4.15$, $p < 0.01$), in the *Threshold* ($z = 4.81$, $p < 0.01$), in the *Baseline 20* ($z = 4.03$, $p < 0.01$) and in the *Baseline 30* ($z = 2.55$, $p = 0.010$).

The minimum quantity of HQ goods was produced by workers in the *Quantity* treatment (*Quantity* vs *Fixed*: $z = 2.35$, $p = 0.02$; *Quantity* vs *Threshold*: $z = 2.96$, $p = 0.03$; *Quantity* vs *Baseline 20*: $z = 2.51$, $p = 0.012$; *Quantity* vs *Baseline 30*: $z = 3.25$, $p = 0.001$).

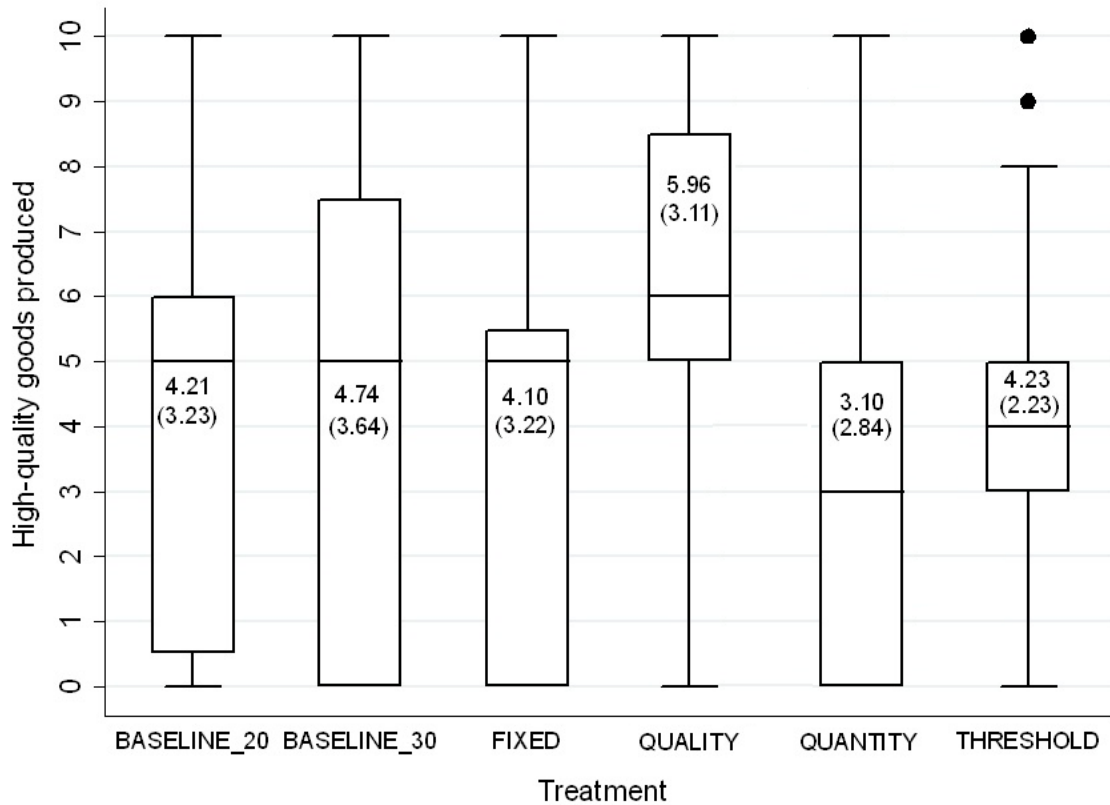


Figure 10 - Number of high-quality goods produced by the workers.*

*Means are reported on the boxes (standard deviations in parentheses).

Result 2: The highest average quantity of HQ goods is produced in the Quality treatment, while the lowest is produced in the Quantity treatment.

This result is supported also by an OLS estimation in which we control for age, gender, number of mistakes in the control questions, Prolific score, student status and beliefs in the case of the treatments in which the financier is present (*Table 1*).

	(1)	(2)
	Full sample	With financier
QUANTITY	-2.840*** (0.437)	-2.758*** (0.406)
FIXED	-1.793*** (0.439)	-1.653*** (0.410)
THRESHOLD	-1.657*** (0.444)	-1.656*** (0.413)
BASELINE 20	-1.638*** (0.475)	
BASELINE 30	-1.126** (0.470)	
BELIEF		1.188*** (0.383)
MISTAKES	0.0653 (0.171)	0.0294 (0.172)
AGE	-0.0187 (0.0193)	-0.00820 (0.0213)
PROLIFIC SCORE	0.125 (0.110)	0.141 (0.122)
FEMALE	-0.247 (0.263)	-0.446 (0.303)
STUDENT	-0.271 (0.305)	-0.0587 (0.341)
CONSTANT	-5.887 (11.02)	-8.727 (12.23)
Observations	596	398
R-squared	0.078	0.141

OLS, standard errors in parentheses. Dependent variable: number of high-quality goods produced by the worker (from 0 to 10).

The benchmark condition is QUALITY treatment. QUANTITY, THRESHOLD, FIXED, BASELINE 20 and BASELINE 30 are dummy variables assuming a value equal to 1 in the corresponding treatment and 0 elsewhere. BELIEF: dummy variable assuming value equal to 1 if the worker expects to be financed; MISTAKES: number of mistakes made in responding to the control questions; FEMALE: dummy variable assuming a value equal to 1 if the subject is female; PROLIFIC SCORE: score that starts at 100 and decrease if a subject's study is rejected. STUDENT: dummy variable assuming a value equal to 1 if the subject is a student. Estimation of a Tobit model provides the same results.

*** significant at 1%; ** significant at 5%; * significant at 10%.

Table 1 - Determinants of workers' decisions to produce high-quality goods.

Going back to the distributions of HQ goods across treatments (figure 9), in the two *Baseline* conditions, in which workers reveal their preferences for the production plans without the need to respond to any external incentives, we observe three peaks in common: at 0, at 5 and at 10 HQ.

Result 3: In the Baseline conditions, when the financier is not present, we can identify three main types of behaviors: workers producing zero HQ goods (in accordance with the self-interest hypothesis H0a), workers producing five HQ goods, and workers producing ten HQ goods, with greatest benefits for the beneficiary.

In *Baseline 20*, 25% of workers produce 0 HQ goods, 26% produce 5 HQ and 26% produce more than 5 HQ goods.

Moving from *Baseline 20* to *Baseline 30*, we observe a positive income effect: an increase of the initial endowment of the workers, from 20 to 30 points, resulted in an increase of the number of them who decided to produce 10 HQ goods, (one-sided proportion test: $z = 1.67$, $p = 0.047$). In this condition, 26% of workers produce 0 HQ goods, 24% produce 5 HQ and 35% produce more than 5 HQ goods.

Result 4: In the Baseline conditions, an increase in their endowment results in a significant increase in the proportion of workers who decide to produce 10 HQ goods, maximizing the beneficiary's payoff.

In the *Fixed* treatment, in which the financier's payoff does not depend on the worker's production plan, 26% of workers produce 0 HQ goods, 30% produce 5 HQ and 25% produce more than 5 HQ goods. These percentages are not different from those observed in *Baseline 20*.

Result 5: The introduction of a financier whose payment does not depend on the workers choice (treatment Fixed) does not have a significant impact on the production of HQ goods with respect to the case in which the financier is absent (Baseline 20).

Moving from the *Fixed* to the *Quality* treatment, we observe an increase in the total amount of HQ goods produced by workers, with 11% of workers producing 0 HQ goods (significantly lower than the *Fixed*: $z = 2.73$ $p = 0.006$), 21% produce 5 HQ and 55% produce more than 5 HQ goods, reaching a production of 10 HQ goods in 22% of workers (significantly higher than the *Fixed*: $z = 2.09$ $p = 0.03$).

Result 6: The introduction of a financier whose payment increases with the beneficiary's payoff (treatment Quality) results in a significant increase in the proportion of workers producing 10 HQ goods and a significant decrease in the number of workers producing 0 HQ goods compared to the case in which the financier payoff is fixed.

Moving from the *Quality* to the *Quantity* treatment, we observe that in the latter 32% of workers produce 0 HQ goods (significantly higher than the *Quality*: $z = 3.61$ $p < 0.01$), 15% produce 5 HQ and only 15% produce more than 5 HQ goods, reaching a production of 10 HQ goods in 6% of workers (significantly lower than the *Quality*: $z = 3.26$ $p < 0.01$).

Result 7: When the financier's payment increases with the total number of goods produced, independently of their quality (treatment Quantity), the proportion of workers producing 10 HQ goods is significantly lower than in the Quality treatment, while the proportion of workers producing 0 HQ goods is higher than in the Quality treatment.

Finally, in treatment *Threshold* we observe a clear convergence on the threshold of 3 HQ goods, with corresponding significant decrease in the proportion of workers producing less or more than 6 HQ goods with respect to the *Quality* treatment.

Result 8: When the worker's choice cannot be observed and measured with precision, and the financier's payment is higher for the attainment of a minimum number of 3 HQ goods, the majority of workers converge on the threshold.

4.2 Workers' beliefs

Examining workers' choices in relation to their beliefs about the possibility of being financed by the financier reveals interesting insights across different treatments. The only two treatments where we observe a significant and positive correlation between the variables are the *Quality* and the *Threshold* treatments (with Spearman's rho coefficient of 0.41, $p < 0.01$ and 0.20, $p = 0.048$ respectively).

In the *Fixed* treatment, workers appear to be uncertain about the type of financier they encounter, particularly regarding whether the financier rewards the production of a high number of HQ goods or a low number of HQ goods. This uncertainty is reflected in the lack of a significant correlation between the number of HQ goods produced and the belief that they will be financed ($\rho = 0.15$, $p = 0.14$). Consequently, this ambiguity leads to a mode of 5 HQ goods among workers. Notably, one-third of those who produce 5 HQ goods do not expect to receive financing (see also figure 9, c).

In the *Quality* treatment, the probability of expecting to be financed is positively correlated with the number of HQ goods produced ($\rho = 0.41$, $p < 0.01$). Nearly all workers who produce more than 5 HQ goods believe they will be financed, with the exception of one worker who produced 6 HQ goods. A significant number of workers choose to produce 5 HQ goods, positioning themselves at the point where the financier should be indifferent between financing and not financing. However, a quarter of these workers do not expect to be financed (see figure 9, d).

In the *Quantity* treatment, workers appear to expect financiers to approve their choices regardless of whether they produce LQ goods (aligning with the financier's and their own interest) or HQ goods (aligning with the beneficiary's interest). Specifically, 85 workers produce between 0 and 5 HQ goods, and 71 of them believe they will receive financing. Additionally, 15 workers produce between 6 and 10 HQ goods, with 10 of them believing they will receive financing (see figure 9, e). In this treatment, there is no significant correlation between the number of HQ goods produced and the belief of being financed ($\rho = -0.14$, $p = 0.16$).

In the *Threshold* treatment, only 8 workers produce fewer than 3 HQ goods, and only two of these workers expect to be financed. Conversely, of the 92 workers who produce 3 or more HQ goods, 89 expect to receive financing (see figure 9, f).

4.3 Financier choices

In the *Fixed* treatment, there is a positive and significant correlation between the number of HQ goods produced and the decision to finance ($\rho = 0.3721$, $p < 0.01$). This indicates that financiers tend to reward workers who produce HQ goods and penalize those who produce LQ goods. This behavior is further supported by the positive correlation between the score assigned in the assessment question and the decision to finance ($\rho = 0.65$, $p < 0.01$).⁷

In the *Quality* treatment, there is a positive and significant correlation between the number of HQ goods produced and the decision to finance ($\rho = 0.59$, $p < 0.01$). Similarly, there is a positive correlation between the score assigned in the assessment question and the decision to finance ($\rho = 0.50$, $p < 0.01$). Specifically, 80% of workers who produce 5 or fewer HQ goods are not financed, while 65% of those who produce more than 5 HQ goods receive financing, with 100% of workers who produce 10 HQ goods being financed.

In the *Quantity* treatment, there is a negative but not significant correlation between the number of HQ goods produced and the decision to finance ($\rho = -0.15$, $p = 0.12$). However, there is a positive correlation between the score assigned in the assessment question and the decision to finance ($\rho = 0.47$, $p < 0.05$). Notably, not all workers who choose to produce 0 HQ goods, thereby maximizing the financier's and their own payoff at the expense of the beneficiary, receive financing.

Finally, in the *Threshold* treatment, financiers only see whether a worker produced fewer than 3 HQ goods (below the threshold) or at least 3 HQ goods (above the threshold). In the first case, financiers choose to finance only 2 out of 8 workers who produce below the threshold, giving an average score of 2.14. In the second case, financiers choose to finance 89 out of 92 workers who produce above the threshold, with an average score of 4.15.

Overall, the financiers' choices and assessments across all treatments demonstrate a nuanced response to workers' production strategies, revealing preferences for high-quality outputs and a keen awareness of the potential impact on beneficiaries. Figure 11 displays the choice of financiers (*financing vs non-financing*) depending on the number of HQ goods produced by workers.

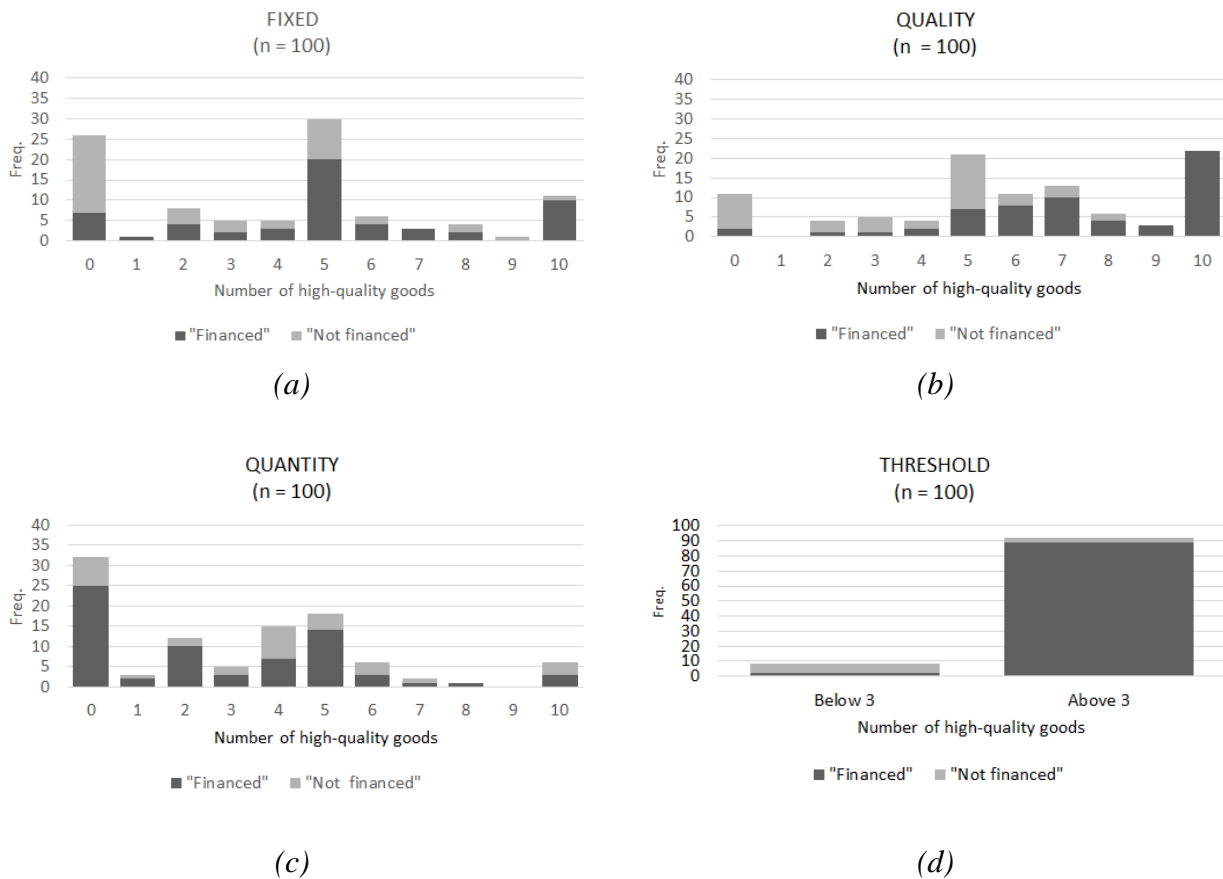


Figure 11 - Workers choices and financiers' decisions.

5. Discussion

5.1 Comments to results

Our work started from the acknowledgment of several movements that emerged in recent decades for funding welfare interventions, by offering new financial instruments to convey private capital to the Third Sector in order to create positive social impact combined with economic returns (Agrawal and Hockerts, 2019; Dagers and Nicholls, 2016; Hochstadter and Scheck, 2015).

The debate on the effective application of these instruments has so far focused on the methods of assessment and social impact measurement for return on invested capital, neglecting the role of the motivations that drive the involved agents (investors and social entrepreneurs) to act. For this reason, our efforts have concentrated on investigating the impact of different financial instruments on the motivations of social enterprise stakeholders.

Our study sheds light on several key points: firstly, we observe the extent to which individuals exhibit pro-social behavior in the absence of explicit incentives. Secondly, we investigate the impact of increased available funds on decision-making. Thirdly, we explore how the presence of a funding agent, with variable remuneration mechanisms, influences agents' behavior. Our results indicate that financing mechanisms can play a crucial role in shaping worker behavior.

We observe that pro-social behavior exists among workers, as evidenced by peaks among different player types when the external financier is absent or when her payoff is not tied to the worker's decisions. In the absence of external incentives, workers displayed a range of behaviors, from purely self-interested to pro-social. In particular, in our *Baseline* conditions, we observe a distribution of dispositional types in the population, with three distinct groups. One group displays self-interested behavior, producing zero HQ goods to maximize their own payoff. Another group exhibits pro-social behavior, producing the maximum number of HQ goods to maximize the beneficiary's payoff, which in this case is equal to that of the worker. The third group falls in between, choosing to produce 5 HQ goods. This choice results in a balanced distribution of payoffs, slightly favoring the worker, who receives more while still leaving some earnings for the beneficiary.

The introduction of an increased endowment in *Baseline 30* led to a significant increase in the proportion of workers choosing to produce the maximum number of HQ goods, suggesting a positive income effect, benefiting the beneficiary.

The most interesting results pertain to our treatment conditions, where the financier can decide to provide additional funds to the worker, and is repaid conditional on some dimensions. Hence we specifically explore whether pro-social motivations can be maintained in case the form of financing of social projects, and hence at least in part the goal of the productive organizations, are redirected so to fit into a market logic and with profit goal of private investors. From the perspective of business ethics, the question is whether the profit goal and pro-social motivations of social workers, aiming at social justice and welfare, are compatible or may engender a conflict dooming the organization to fail.

Our results indicate that when financiers' payments were independent of the worker's production plan (*Fixed* treatment), workers showed no significant deviation from their behavior in absence of financing. This suggests that workers may not be influenced by the presence of a financier if there are no additional incentives tied to their production choices.

On the other hand, when financiers' payments were contingent on the quality of goods produced (*Quality* treatment), workers responded by significantly increasing the production of HQ goods, indicating a strong alignment between their behavior and the financier's incentives. This suggests that workers are responsive to financial incentives, even when these are designed to favor financiers and indirectly affect workers.

However, treatment variations in our study reveal that this result is possible only when the quality of welfare products and services can be observed, measured, and linked to financial instruments in a precise manner. Whenever measurement is poor or costly, this might translate into perverse effects on pro-social motivations and workers' behavior.

In the *Quantity* treatment, financiers' payments were based solely on the total number of goods produced, irrespective of their quality. Workers displayed a mixed response, with some still producing HQ goods, but overall, there was a decrease in the production of HQ goods compared to the *Quality* treatment. This indicates that when financiers' payments are tied solely to quantity, workers may prioritize quantity over quality, to the detriment of the welfare of the beneficiaries.

In the *Threshold* treatment, financiers' payments were contingent on whether workers met a minimum threshold of HQ goods. Here, workers converged on the threshold, with a significant

decrease in the proportion of workers producing less or more than the threshold. This suggests that workers respond to clear performance thresholds set by financiers.

Our findings suggest that workers navigate a complex interplay between their own motivations and the incentives provided by funding mechanisms. The awareness that their chance of receiving funding depends on the financier's choice prompts workers to carefully consider the tradeoff between personal motivations and external incentives. Moreover, poor measurement practices can significantly impact worker behavior, highlighting the importance of accurate performance metrics.

5.2 Business ethics implications and conclusions

Several contributions have shed light on the contested nature of impact (Hockerts et al., 2022), with various notions of materiality themselves being disputed. It is clear that different stakeholders have varying interests in identifying impact, whether for investors, social enterprises, or beneficiaries. Power dynamics often prioritize the interests of certain groups, as evidenced by the divergence between managers and investors, among investors with different interests, and various stakeholders (Lehner et al., 2022). This complexity underscores the importance of normative frameworks, such as a theory of justice, in capturing the measure of impact. Utilizing normative theories can help address the ethical considerations inherent in impact measurement, aligning with values of well-being and justice for beneficiaries.

Normative frameworks, such as justice theory, offer valuable insights into navigating the complexities of impact measurement and ethical behavior. Additionally, the influence of institutional structures on moral preferences highlights the need for policymakers and organizations to consider the impact of institutional design on ethical behavior and prioritize alignment with social objectives. Ultimately, the study suggests that institutional frameworks play a significant role in shaping ethical preferences and behavior, with implications for the pursuit of social welfare and justice.

Diverse normative ethics theories offer support and justification for different organizational forms. For instance, libertarian theories (Nozick, 1974) may advocate for maximizing shareholder value, as managers' sole fiduciary duty is owed to property rights holders. In contrast, social contract or Rawlsian perspectives on social justice may provide a rationale for socially responsible corporations that endorse an extended model of corporate governance, with fiduciary duties owed to all corporate stakeholders based on principles of justice (Sacconi, 2006; 2011). These normative views may also provide a basis for making sense of the social justice purposes, often embraced by social enterprises or non-profit organizations (Grimalda and Sacconi, 2005). Our conjecture is that social enterprises, as part of the social welfare system, are grounded on some understanding of the social contract, and on the other hand their employees and entrepreneurs derive intrinsic motivations from their sharing of a sense of justice and commitment to the public good and welfare of disadvantaged persons. This thesis has been formulated through various works on 'conformity preferences' (Grimalda and Sacconi, 2005; Sacconi, 2007; Cecchini Manara and Sacconi, 2019), which allow social enterprises to be explained as stable institutions insofar as they are in equilibrium. Preferences are influenced by the constitutive agreement on the institutional form and are activated by the beliefs generated in that institutional form.

Beyond normative considerations about which theory of organizational justice may support which institutional form (Phillips and Margolis, 1999), hence also the ‘realism’ of ethical theories can be enquired (Nagel, 1986). This means to enquire whether a normative view, that theoretically aligns with an organizational form also influences the preferences and behaviors of those who participate in the organization (Donaldson and Robertson, 2019). This raises questions about whether individuals within an organization are inclined to support its aims and adhere to its norms based on their ethical beliefs. The experimental method is particularly relevant for this kind of inquiry (Francés-Gómez et al., 2015).

Summing up, this line of research suggests that the broad range of justice or ethical views, often regarded as the ethical foundation of organizational forms such as social enterprises, nonprofits, or low-profit organizations, allow for predicting the behavior of organizational members in terms of their alignment with the organization’s norms and goals. Essentially, the aim is to determine if normative theories that provide justification for these organizational forms also effectively shape and predict the behavior of organizational members in practice.

This study casts new light on this conjecture, supported by evidence that pro-social preferences develop in conjunction with complementary institutional rules. It suggests that preferences and behavior of organizational members that are consistent with some ethical view, are also strongly contingent on the organizational form and its coherence in all its relevant parts with the given normative view. This intricate relationship between institutional frameworks and individual preferences - as argued by Elinor Ostrom (2005) - suggests a mutual reinforcement: institutional rules shape pro-social preferences, which in turn uphold and stabilize institutional arrangements. Preferences (pro-social preferences and self-interested preferences as well) are not given independently once for all or primitively. They are complementary with given institutions, and the ethical theory implicit in it. Therefore, they easily may be crowded out or corrupted even due to partial changes in the organizational form.

This plasticity of preferences vis-à-vis institutional forms is particularly evident in social enterprises and nonprofit organizations, where pro-social preferences align with the organizations’ objectives of social welfare and justice for beneficiaries. However, such plasticity is deeply contingent on the coherence of the institutional and organizational form with the principle of justice and the ethical view that aligns with it. A partial change in the organizational form, such as the terms under which financial investors are paid, can compromise the coherence with the ethical model. This can disrupt the complementarity between the institutional structure and individual preferences, causing preferences to be shaped by an alternative organizational model rather than the normative theory aligned with the institutional form. As it is said in the case of ‘framing’, it depends on what part of the fragmented organizational form elicits the relevant system of beliefs and preferences. Consequently, the normative theory under consideration may lose much of its motivational realism. Importantly, the study reveals that moral preferences are not inherently fixed but can be shaped by institutional arrangements and may be corrupted by changes in incentive structures.

In conclusion, our research underscores the importance of considering the profound impact of institutional structures and objectives on shaping individual preferences. We demonstrate that pro-social preferences, often assumed to be ‘natural’, ‘spontaneous’ or ‘objective’, are on the contrary fragile and contingent upon the institutional context and can evolve with apparently small changes in institutional mechanisms. For instance, alterations in the remuneration mechanism of an external

financier, that becomes a secondary goal for the worker, can reshape the mental model through which workers perceive the purpose of their activity, leading to a shift from pro-social to self-interested preferences. This dynamic is exemplified in our study, where variations in the financier's remuneration scheme influence workers' preferences, steering them towards outcomes aligned with the revised institutional objectives, albeit potentially diverging from the organization's original mission. As economic institutions are social constructions, they can be created through collective choices, agreements, conventions and mutual understanding, and also framed according to some ethical view or idea of justice. As a whole, the delicate equilibrium of complementarities between institutional form and preferences results to be fragile and may collapse for apparently minor organizational changes.

Appendices

All the supplementary material can be retrieved at:

https://osf.io/8jqny/?view_only=38a6ab7662a5431688ded1852b510780

Appendix A – Instructions

Appendix B – Payoffs calculation

Appendix C – Demographics

Appendix D – Financiers assessments and consistency

Appendix E – Beneficiaries decisions

+ Database

¹ Note that for simplifying reasons, we assume that the beneficiary paired with a worker is only one, and receives all the goods produced by the worker, and that the beneficiary's payoff increases with the number of goods received and with their quality. This is obviously a simplification, both because usually service providers offer services to a wide range of beneficiaries, and more importantly because several welfare goods require a personalized effort to find the better treatment.

² The complete payoff tables corresponding to the Figures of this section are available in *Appendix B*.

³ The full instructions are available in *Appendix A*.

⁴ Compared to the traditional laboratory experiments, the online recruiting has both advantages and disadvantages. The greatest advantages are the average cost of an observation, the instantaneous recruitment and the subjects' sample, which is more representative of the general population compared to the canonical cohorts of students usually involved in standard laboratory experiments. The main shortcoming is the reduced control over the subjects taking part in the study. However, so far many studies have tried to demonstrate the validity and the quality of the data collected through online experimental procedures (Paolacci et al., 2010). These studies did so mainly reproducing the results of the standard games, like for instance the prisoner's dilemma (Horton et al., 2011) or the ultimatum game (Rand, 2012).

⁵ For a short of Beneficiaries' beliefs see *Appendix F*.

⁶ All the comparison of this section are based on this type of test.

⁷ In general, financier's decisions are consistent, in the sense that given the same quantity of HQ goods produced by two or more workers the financier either finance or not finance all these workers. We observe only one case of inconsistent choice in the Fixed treatment and in the Threshold, and five in the Quality treatment (see *Appendix D*).

List of Figures and Tables

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