Unshrouding product-specific attributes through financial education

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Abstract

We present a welfare framework to evaluate the market effects of financial education interventions. Using this framework, we assess a new product-specific rules of thumb-driven consumer financial education program provided just before purchase decisions. While our intervention improves knowledge and outcomes for newly-educated consumers, it is a Pareto-improvement only under a narrow set of conditions, as are other interventions in the literature. Our findings suggest that positive treatment effects for a small fraction of consumers may come at the cost of other uninformed consumers in retail financial markets, making positive effects necessary but not sufficient to adopt financial education policies.

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1 Introduction

Retail financial product markets have exploded in the last two decades. However, the financial literacy required for households to make welfare-improving decisions has not kept pace with this increasingly complex product market environment (Lusardi and Mitchell 2014, 2011). The gap between retail market complexity and financial literacy plays a role in generating wealth inequality (Lusardi, Michaud, and Mitchell 2017, Campbell, Ramadorai, and Ranish 2019) and distorts retail financial markets (DellaVigna and Malmendier 2004). These undesirable outcomes have led to calls for financial education interventions and regulation to offset the cost of financial illiteracy (Campbell 2016). The nature of the intervention, however, remains an open debate. The design of an effective intervention and whether or not to use it in the first place relies on its capacity to improve household financial behavior without creating additional costs to society or other consumers in the market. In this paper, we propose a welfare framework to evaluate the market effectiveness of financial education interventions and use it to assess our new and enhanced financial education as well as the most effective examples of interventions from the literature. Even though our intervention is conventionally effective – significantly improves financial decision making and is low-cost and easily scalable – it achieves a social welfare improvement only under a narrow set of conditions. The same is true for other interventions in the literature, adding a new dimension to consider while adopting financial literacy interventions.

Thus far, financial education interventions have only focused on inducing better financial behavior and decision-making for a given household.[1] The welfare gains to a newly

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[1] A meta-analyses of 76 randomized experiments by Kaiser, Lusardi, Menkhoff, and Urban (2020) show that financial education interventions, on average, have a positive effect on financial knowledge and downstream financial behaviors. However, Fernandes, Lynch Jr, and Netemeyer (2014), Cole, Paulson, and Shastry (2014) find mixed evidence of its effectiveness using administrative data and other non-randomized studies. On the role of regulatory intervention, see Campbell (2016), who draws out a welfare framework to assess its merits.

educated household are noteworthy and illustrated in Lusardi, Michaud, and Mitchell (2015). Implicit in the argumentation in this literature is the assumption that such gains are not at the cost of any other household, i.e. that they are Pareto optimal. However, financial education as a policy instrument requires an assessment of welfare not just for educated households, but the externalities on those who remain less educated. For example, in a retail financial product market with shrouded features, firms extract rents from less informed consumers' mistakes and are able to hold on to the demand from informed consumers through cross-subsidy (Gabaix and Laibson 2006). Increasing the share of informed consumers through an education intervention could lead to a higher required cross-subsidy and thereby higher costs for less-educated consumers.

In the first part of the paper, we introduce financial education into a model of a retail product market with shrouded *value*, inspired by Gabaix and Laibson (2006). In the model, financial firms use consumers' lack of financial knowledge to sell an overpriced product. We show that in this market financial education intervention can have both positive and negative spillover effects on other consumers, depending on how firms respond to the presence of a higher share of educated individuals. The positive effects would manifest themselves in firms unshrouding product value to all consumers in the market – an outcome that would result in welfare improvement for all. Financial education intervention would have a negative effect when firms continue to shroud product *values* and increase the costs for consumers left uneducated, reducing their welfare to subsidize the newly-informed consumers. Such costs are important to consider while adopting specific financial education designs as policy tools to combat financial illiteracy.[2]

The model provides a welfare analysis framework to assess the trade-off in financial

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[2]By design, our set up only considers consumers to either be uninformed or informed. We do not consider rationally inattentive consumers in this study. However, it may be useful to note that should consumers be rationally inattentive to the shrouded value in this product market, a policy intervention may be unwarranted in the first place.

education between improving welfare for newly educated consumers and negative externalities, similar in spirit to Finkelstein and Hendren (2020) and Campbell (2016).[3] We formally derive the fraction of newly educated consumers needed to sway firms into unveiling true product value and setting unshrouded prices in equilibrium. The analysis shows that the higher the *ex-ante* fraction of uninformed consumers in a market, the larger the intervention effect needs to be to ensure "effective financial education", i.e. one that does not adversely affect consumers who remain uneducated.

To evaluate an intervention using our welfare framework, we require conventionally successful, positive treatment effects for newly-educated consumers. While traditional interventions provide elementary knowledge about finance, it may not be sufficient to enable households to unshroud product features and unpack its complexity. Consumers need contextual lessons to make specific purchase decisions, delivered when it is most required, i.e. when they are making such decisions. Yet, to date, we do not find many education interventions that are product-specific in the literature. In the second part of this paper, we design and test a financial education intervention that equips consumers with rules of thumb to evaluate a product in terms of their needs and infer from high-powered incentives for brokers and agents that the product may be sub-optimal. Our intervention is scalable, inexpensive, and easy to roll out, making it a feasible approach to enable product-specific financial education. A field experiment in India shows that our intervention has significant positive effects on the newly-educated consumers in the market. However, using the welfare framework laid out in this paper, we find that our intervention may not be sufficient to avoid negative costs on consumers who remain uneducated. The financial intervention leads to a Pareto-improvement in the market only for a narrow set of model parameters.

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[3]We assume that a not-for-profit third-party provider delivers this education. The education provider's incentives are important, as Gabaix and Laibson (2006) note that incentives can drive the intervention's content and, consequently, its effects.

We set up and evaluate our financial education intervention with a particular product in the Indian insurance market known as *endowment insurance*. An endowment insurance product combines term insurance with a savings instrument. The contracts pay a lump-sum when the policy matures or on death. These are bundled products designed to respond to consumer misperception of the product's objective (Bar-Gill 2007). Typically, such products are marketed as a perfect substitute for term insurance with additional "worry-free" safe investment. However, these products shroud important features such as the rates of return on the risk-free savings component of the product and overstate the true value of the product.

Products like endowment insurance are costly and harmful to individuals. They provide neither insurance at actuarially fair prices nor the market returns on a risk-free savings instrument. Even though the exit cost is always substantial, more than 50% of the consumers in India terminate their contracts within five years. Even so, endowment insurance products make up a large portion of the life insurance market in India (Halan 2020). The dominance of endowment insurance is likely a consequence of strong incentives for insurance companies and their agents to maximize profits, coupled with the lack of financial knowledge among potential consumers. In the Indian context, Anagol, Cole, and Sarkar (2017) study the role of commission motivated agents and find that agents overwhelmingly recommend unsuitable, strictly dominated products and cater to the beliefs of uninformed consumers. Our study looks at the role of financial education in the same setting. The Indian market for endowment insurance matches closely our model environment and allows us to evaluate financial education intervention with our new welfare assessment framework.

Our experiment consists of showing videos to potential consumers of an endowment insurance product. The videos present consumers with the right questions to ask about the product and introduce rules of thumb to help assess the information gathered from

the answers. We introduce two types of intervention. The first treatment (T1) provides consumers with the rules of thumb. The second treatment (T2), in addition to the rules of thumb, unshrouds product features and evaluates how good the product is. While the first treatment equips consumers to uncover the product's true value by themselves, the second treatment presents an explicit evaluation of the product. The first treatment is motivated by the effectiveness of rules of thumb in Drexler, Fischer, and Schoar (2014). And the second treatment is inspired by the idea that consumers may not be Bayesian, or that they may not possess the cognitive capability to infer that, if a product has hidden features, it must be mispriced (or misvalued).

A careful assessment of the ethics involved in inducing an actual sale of an endowment product – considering its gross unsuitability to potential consumers – guides our experimental design.[4] In addition to the ethical considerations, selling insurance products without being a registered agent is illegal and as highlighted in Anagol, Cole, and Sarkar (2017), no insurance company nor its agents have any incentive to collaborate with researchers to undo this dominant feature of the Indian insurance markets. We replicate the standard endowment insurance contract in the market and its marketing materials and elicit intention to purchase from a large field experiment involving 2,838 households sampled across Delhi, India. We obtain responses in two rounds of surveys; the first round draws out the intention to purchase a replicated endowment insurance product identical to the standard endowment insurance contract in the market. We then follow up with the second round outside the experiment and elicit the intention to purchase term insurance - a more suitable financial product - over a telemarketing conversation with trained surveyors. We design the follow-up round to be as close as possible to a real sale. This research design allows us to evaluate our financial education intervention's

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[4]Inducing an actual sale of an endowment product is very costly; consumers face many years of payments for the product and high exit costs. Our experimental setup acknowledges the concerns about an actual sale of the endowment product raised through the ethics review process and stops short of measuring realized demand.

effect without violating our ethical and legal responsibilities.

Our primary outcome is measured by offering an endowment product to the participants. Our first treatment with rules of thumb results in a 3 percentage point decline in the intention to purchase endowment insurance or an 8.3% increase in the base rate of rejecting endowment insurance observed in the control group. Consumers in the first treatment are more likely to have a higher knowledge of the product features and to be able to identify and discover specific characteristics of the endowment insurance presented to them in the experiment. The second treatment with an explicit product evaluation produces similar magnitudes of decline in the intention to purchase endowment insurance, though not statistically significant at conventional levels. In the second treatment, complete information disclosure and product evaluation may have made the decision process more complicated, hitting cognitive constraints of the treated individuals and, as a result, reducing the effectiveness of the intervention design.

We also test whether our approach increases potential demand for a better product in the market – simple term insurance. Using follow-up blinded telemarketing calls, we find that participants from the first treatment are significantly more likely to demand term insurance. In contrast, the second treatment participants are no different from the control group in their potential demand for term insurance. Thus, the introduction of rules of thumb leads to the possible substitution of the suboptimal product with a good product, consequently improving the welfare of newly educated consumers.

Overall, the results of our experiment suggest that product-specific rules of thumb have the potential to improve purchase decisions by meaningful magnitudes, especially in light of Kaiser, Lusardi, Menkhoff, and Urban (2020), who show that financial education interventions with insurance decisions have thus far not been effective. Additionally, our estimates are consistent across different rounds of outcome elicitation and we document

positive treatment effects with changes in knowledge and unshrouding of product features, standard measures in the study of information intervention effects.

We proceed to evaluate whether our financial education intervention has the potential to transform the product market space from a shrouded to unshrouded equilibrium. We calibrate our theoretical model given the market parameters. We conclude that our experiment translates into a narrow range of improvement. The experiment and the theoretical benchmark suggest that positive treatment effects are necessary to improve the welfare of newly educated consumers, but may not be sufficient to achieve a Pareto improvement in the market. In a market with a high share of uninformed consumers, as in many financial product markets across various countries globally, financial education needs to deliver a substantial treatment effect – magnitudes guided by calibrating our model. Finally, we evaluate the most effective financial education interventions in insurance markets from the previous literature and compare the results to our intervention. We reach the same conclusion from the model calibrations that even the best financial interventions are very likely to lead to costly negative externalities, a fact that the literature has mostly overlooked.

2   Value Shrouding and Financial Education: A Model

We first set up a theoretical model of a retail product market with shrouded values and a financial education intervention for its consumers. In the model, financial firms sell a financial product to consumers where they mask the fact that the product is overpriced (or overvalued). Unlike the setting in Gabaix and Laibson (2006), firms do not explicitly hide product features. For example, firms can present the product's gross return or an absolute value of the final pay-out without providing total costs, making product

evaluation more difficult.[5] There are two types of consumers in the market. The first type is unaware of value shrouding and lacks financial knowledge to unveil the product's true value. Whereas, the second type is aware of the overpricing and can avoid it at a non-zero cost. Firms choose whether to shroud or unshroud the product's true value depending on the share of educated consumers. Shrouding the product's true value allows financial firms to extract profits from consumers with no financial knowledge and keep the demand from informed consumers by subsidizing the unbundled product. Consequently, firms keep shrouding the true value if uneducated consumers' share is large enough in equilibrium without an educational intervention.

In this market, financial education intervention increases the share of educated consumers and, therefore, improves newly-educated consumers' welfare. Besides, by raising the share of informed consumers, the intervention can create incentives for firms to stop shrouding the true value of the product and set up the unshrouded equilibrium prices, resulting in welfare improvement for all consumers in the market. However, unshrouding happens *only* when the effect of education is large enough. Smaller education effects could lead to firms keeping shrouding and increasing costs for less-educated consumers to cover transfers to newly educated consumers.

2.1   Baseline Model

We now describe the baseline model before an education intervention. The model is populated by a finite number of profit-maximizing firms selling a financial product. The total price of the product on the market, P, and the product promises a total pay-out of V. Firms can decide to shroud the actual value of the product by declaring that its value

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[5]The firms are technically and legally correct in such a presentation as they do not hide that they compute returns on the annual premium rather than the total product cost. Often, uninformed consumers do not realize that they calculate returns in a most unhelpful manner.

is equal to V_s, when the true pay-out is lower by a nonzero amount q, so $V_s - V = q > 0$.[6] Therefore, q is a hidden loss or a *"hidden value-discount"* for the consumer. This loss can emerge, for example, if firms present the final pay-out in nominal terms instead of real terms and a consumer can not distinguish between two. Similarly, it can also emerge when the rate of return presented does not take time-value into account and consumers lack the knowledge to consider, for example, the impact of inflation over time. By shrouding the quality of the financial product, a firm makes an additional profit q.

The hidden value discount, q, is not directly revealed to the consumers by firms, but some consumers know about it *ex-ante*. Let us assume the mass of consumers in the economy is normalized to 1 and all consumers aim to invest in the financial product. There are two types of consumers: a fraction α of all consumers are myopic and only consider the stated price of the product P, and the presented pay-out V_s. The remaining fraction $(1 - \alpha)$ are sophisticated consumers and consider the price of the contract, P, the expected pay-out, V, and the value-discount, q, imposed by the firm.[7] In a real-world setting, myopic consumers would, for example, evaluate the product using nominal returns, when sophisticated consumers consider the real rate of return.

The division between sophisticated and myopic consumers in the economy is common knowledge. However, while pricing the product, firms cannot distinguish between sophisticated and myopic individuals, making price discrimination impossible. Many financial product market sellers, even when receiving a signal about the type of customer they are dealing with, do not offer different pricing or alternative products (Anagol, Cole, and Sarkar 2017).[8]

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[6]We use the pay-out from the product as a characteristic of its quality. The overpriced product would be considered lower in quality and therefore sub-optimal.

[7]When the information is unshrouded, the expectation for the hidden loss, q, is equal to its true value. When the information is shrouded, sophisticated consumers anticipate perfectly the value of q that the firm sets in equilibrium.

[8]A version of the model with price discrimination and its price equilibria for a financial product with shrouded features is discussed in Kosfeld and Schüwer (2017).

Sophisticated investors know about the value-discount of the product, q. They infer that it is different from zero ($q > 0$) and can potentially opt-out of paying it by substituting the product with a replicating portfolio with the same price and pay-out V_s. However, the substitution comes at a cost, e. The cost can take different forms. For example, for insurance markets Anagol, Cole, and Sarkar (2017) show that agents selling the sub-optimal products are motivated by the large commissions they receive from it. Thus a sophisticated consumer needs to compensate for the agents' forgone commission to gain access to the term insurance contract only. Such compensation would be a part of the cost of substitution, e.[9]

All consumers in the economy have a maximum tolerance for the hidden value-discount, $\bar{q}$, which sets an upper bound for q, i.e., $q \leq \bar{q}$.[10] The cost of substitution is lower than or equal the maximum possible value discount, $e \leq \bar{q}$.[11]

2.2 Timeline

The timing of the model is as follows.

Period 0: The firm decides on how to present the information about the financial product. It chooses whether to shroud the true value of the product by showing $V_s > V$ or present the product's true value V and sets the price P. Unshrouding is free for the firm: it simply needs to show $V_s - q$ to all consumers. The total value of the product is presented as V when unshrouded, and $V_s = V + q$ when shrouded.

Period 1: Sophisticated (informed) and myopic (uninformed) consumers make decisions. Sophisticated consumers recognize that the financial product's value can be too high for its price. While evaluating their decision to purchase, sophisticated consumers always

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[9]In the model, the firms are homogenous: thus the cost of substitution is the same for all firms.

[10]Gabaix and Laibson (2006) call $\bar{q}$ the maximum willingness to pay for the add-on. The value of $\bar{q}$ can correspond to legal and regulatory constraints limiting the penalties/ fees that firms can charge.

[11]If $e > \bar{q}$, sophisticated consumers will never opt-out of the product.

take the true value, V, and the presented value $V_s > V$ into account. If the information is shrouded, they form Bayesian posteriors about this unobserved information - i.e. they consider $\mathbb{E}q$.

If the value of the product is shrouded, sophisticated consumers have the option to purchase a replicating portfolio with the final pay-out equal to V_s. The cost of substitution from the product is equal to e. The net gain for the sophisticated consumer is equal to:

$$\text{Net Gain}_{sophisticated} = -P + (V_s - min\{\mathbb{E}q, e\}) \tag{1}$$

Myopic consumers only consider the value of the product revealed by the firm. When the true value is shrouded, all myopic consumers stay uninformed and only observe the total reported gain from the product. The expected net gain for myopic consumers is equal to:

$$\text{Exp Net Gain}_{myopic} = -P + V_s, \tag{2}$$

whereas the realized net gain would be:

$$\text{Net Gain}_{myopic} = -P + V_s - q, \tag{3}$$

If a firm decides to unshroud the true product value, it effectively educates λ fraction of myopic consumers, who become informed at that point. These newly-informed myopic consumers behave just like sophisticated consumers toward all firms. Nonetheless, the rest of myopic consumers, a fraction $(1 - \lambda)$, remain uninformed.

Period 2: Myopic consumers pay the full price and get the product. Sophisticated consumers and newly-educated consumers pay their prices and get the product or its fairly-priced equivalent. In the case of shrouding, sophisticated consumers bargain with

firms for the fairly priced pay-out and purchase the product. In the case of unshrouded values, both myopic and sophisticated consumers are presented with fair prices and purchase the product from the firm.

2.3 Price Equilibria

Let x_i represent the difference of a consumer's average gain from the purchase of the financial product from firm i and a consumer's average gain from the best alternative firm. For a sophisticated consumer, x_i is equal to[12]:

$$x_i = [-P_i + V_{s,i} - min\{q_i, e\} + P^\star - V_s^\star + min\{q^\star, e\}] \tag{4}$$

For a myopic consumer, it is:

$$x_i = [-P_i + V_{s,i} + P^\star + V_s^\star]. \tag{5}$$

$D(x_i)$ represents the probability that an individual buys the product from firm i or the demand of one type of the consumers for the product sold by firm i.[13] The degree of competition in the industry can be defined as $\mu = \frac{D(0)}{D'(0)}$ or the average profit per consumer.

The firms would decide to shroud or unshroud the true value of the product depending on the share of myopic consumers in the economy, α. Thus we have:

Proposition 1:

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[12]Following Gabaix and Laibson (2006), throughout the paper we use starred variables to represent the (symmetric) prices set by other firms.

[13]The demand function D is strictly increasing, bounded below by zero, and bounded above by one. The assumptions in Gabaix and Laibson (2006) are valid for our case and are described in their Appendix.

Let

$$\alpha^{\dagger} = \frac{e}{\bar{q}} \quad \text{and} \quad \mu = \frac{D(0)}{D'(0)}$$

If the fraction of myopic individuals, α, is greater than $\alpha^{\dagger}$, there exists a symmetric equilibrium in which firms keep the true value of the product hidden. We call this equilibrium Shrouded Value Equilibrium.[14] The equilibrium prices are respectively:

$$P = -\alpha\bar{q} + V_s + \mu \quad \text{and} \quad q = \bar{q} \tag{6}$$

If the fraction of myopic individuals, α, is less than $\alpha^{\dagger}$, there exists a symmetric equilibrium in which firms do not hide information and disclose the true product value to all consumers. This constitutes Unshrouded Value Equilibrium. The equilibrium prices are respectively:

$$P = -e + V_s + \mu \quad \text{and} \quad q = e \tag{7}$$

Proof: Appendix A.

2.4 Comparing Equilibria

The type of equilibria matters for the economy. In Shrouded Value Equilibrium, the firms are not only hiding the information from consumers; myopic consumers are also strictly worse off and subsidize the sophisticated consumers.

Proposition 2a: In Shrouded Value Equilibrium, sophisticated consumers are better-off than myopic consumers. The surplus differential between myopes and sophisticates is equal to $\bar{q} - e > 0$.

Proof: First, let us compare the net gains of sophisticated and myopic consumers in

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different types of equilibria.

Consider the case of Shrouded Value Equilibrium in which a sophisticated consumer gives her business to a firm, which shrouds the true product value. The consumer negotiates the pay-out and purchases the product while receiving V_s as a pay-out. In that case, sophisticated consumer's surplus will be:

$$Sophisticated\ Surplus\ Shrouded = -P + V_s - e$$
$$= \alpha\bar{q} - \mu - e \qquad (8)$$

At the same time, the myopic consumer ends up with the largest value-discount $\bar{q}$. The myopic consumer's surplus is the following:

$$Myopic\ Surplus\ Shrouded = -P + V_s - \bar{q}$$
$$= \alpha\bar{q} - \mu - \bar{q} \qquad (9)$$

The difference between surpluses is equal to $\bar{q} - e$ and is greater than zero. In this case, firms exploit the lack of knowledge on the part of myopic consumers. A firm can offer a better product to the sophisticated consumer, the product with higher realized value, and compensate its losses by setting the product value-discount q for the myopic consumers at the highest level, $\bar{q}$. In Shrouded Value Equilibrium, myopic consumers subsidize sophisticated consumers. $\square$

Proposition 2b: In Shrouded Value Equilibrium, the welfare loss is $(1 - \alpha)e$. In Unshrouded Value Equilibrium, there is no inefficiency and all individuals are equally well-off.

Proof: The cost of effort from sophisticated consumers, $(1 - \alpha)e$, constitutes the dead-weight welfare loss, since for firms the cost of shrouding the information about the

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true product value is equal to zero.

In Unshrouded Value Equilibrium, all consumers face the same prices, i.e. myopic and sophisticated consumers have the same surplus. Furthermore, when product values are unshrouded, sophisticated consumers do not need to exert any effort to bargain for a better deal. Thus, in Unshrouded Value Equilibrium, there is no inefficiency and all consumers are equally well-off. $\square$

From **Propositions 2a** and **2b**, we know that Unshrouded Equilibrium is a Pareto improvement compared to Shrouded Value Equilibrium and a desirable equilibrium for the market for a product with shrouded value. There are two ways in which the market can achieve Unshrouded Value Equilibrium: firms can unshroud the values themselves or a third party can educate myopic consumers, therefore decrease their share in the population, and remove the incentive for firms to shroud information.

The proof of **Proposition 1** shows that if $\alpha > \alpha^\dagger$, in other words, the share of myopic consumers is large enough, a firm does not have an incentive to unshroud the true value of the product by itself. This is true no matter how many consumers a firm can educate by unshrouding product values. Firm education does not change the demand for the term insurance, $D(P^\star - P)$, therefore it does not affect the profit of the unshrouding firm when $q \leq e$ and strictly decreases the profit when $q > e$.[15]

Another possible way to accelerate unshrouding or to make firms reveal true product values is to provide third-party education (Kosfeld and Schüwer 2017, Gabaix and Laibson 2006). The main aim of such education would be to increase the ex-ante number of sophisticated consumers, thus moving α below $\alpha^\dagger$ and, consequently, making firms choose unshrouded equilibrium.

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[15]Detailed proofs are provided in Appendix A.

2.5 Introducing Financial Education

Suppose a policymaker can educate a fraction of myopic consumers before firms decide on their information and pricing strategy. This intervention increases the share of sophisticated consumers in the population from $1 - \alpha$ to $(1 + \gamma)(1 - \alpha)$ before, and independent of, any potential educational effect of a firm's unshrouding strategy.[16]

In the presence of a third-party financial education, the price equilibria are no longer the same. Now the share of myopic consumers is equal to:

$$\alpha^\S = 1 - (1 + \gamma)(1 - \alpha)$$

Shrouded Value Equilibrium exists if $\alpha^\S > \alpha^\dagger$ and firms set up the following prices

$$P^\S = -\alpha^\S \overline{q} + V_s^\S + \mu \quad \text{and} \quad q^\S = \overline{q}. \tag{10}$$

Unshrouded Value Equilibrium exists if $\alpha^\S < \alpha^\dagger$ and the prices are the following

$$P^\S = -e + V_s^\S + \mu \quad \text{and} \quad q^\S = e. \tag{11}$$

It is important to note that, if the effect of education is not sufficient and the share of myopic consumers is still large (or $\alpha^\S > \alpha^\dagger$), the market will stay in Shrouded Value Equilibrium (10). With these prices, myopic consumers become worse off than they were before the education intervention. After "not enough" education, myopic surplus is equal to:

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[16]Gabaix and Laibson (2006) raise a concern that such an education would be costly and its provider might have biased incentives. To abstract from implementation costs, we assume that the cost of educating individuals is negligibly low and that the policy-maker is a non-profit organization with well-designed incentive structures independent of financial firms.

$$-\mu - \overline{q}(1 - \alpha^{\S})$$

The myopic surplus in Shrouded Value Equilibrium before education was equal to:

$$-\mu - \overline{q}(1 - \alpha)$$

Given that $\alpha > \alpha^{\S}$, the myopic surplus after "not-enough" education is lower than before the education:

$$\underbrace{-\mu - \overline{q}(1 - \alpha)}_{\text{Myopic Before Education}} > \underbrace{-\mu - \overline{q}(1 - \alpha^{\S})}_{\text{Myopic After Education}} \tag{12}$$

Sophisticated consumers are also worse-off after "not-enough" education when the market stays in Shrouded Value Equilibrium:

$$\underbrace{(\alpha\overline{q} - e) - \mu}_{\text{Sophisticated Before Education}} > \underbrace{(\alpha^{\S}\overline{q} - e) - \mu}_{\text{Sophisticated After Education}} \tag{13}$$

Both myopic and sophisticated consumers are worse off after "not enough" education. Since the values stay shrouded, myopic consumers continue cross-subsidizing sophisticated consumers. Similar logic is provided by Kosfeld and Schüwer (2017), who show that, unless education moves the market to Unshrouded Value Equilibrium, myopic consumers bear higher losses compared to the time before education.

It is important to understand what effect magnitude makes a third-party education effective at the market level. To guarantee Unshrouded Value Equilibrium, the education provider needs to make sure that education guarantees the new share of myopic consumers

in the economy to be lower than the threshold, i.e. $\alpha^{\S} < \alpha^{\dagger} < \alpha$. Thus, the effect of education should satisfy the following condition:

$$1 + \gamma \geq 1 + \gamma^{\star} = \frac{1}{1 - \alpha} \left[1 - \frac{e}{\overline{q}} \right] \quad \text{s.t.} \quad \frac{\alpha}{1 - \alpha} \geq \gamma \geq 0 \tag{14}$$

where e is the price of substitution (ability to negotiation), α is a share of myopic individuals before the education intervention, and $\overline{q}$ is an upper bound for the hidden value discount. The value of γ is constrained from above since the intervention can educate at most all the myopic investors. Note that the threshold $\gamma^{\star}$ is invariant to equilibrium prices and does not depend on the level of competition in the economy.

From Equation (14), if the effect of an education intervention, γ, is larger than the threshold $\gamma^{\star}$, the following is true:

$$\underbrace{\gamma \left(1 - \alpha \right) \overline{q}}_{Firm\ Loss\ from\ Education} \quad \geq \quad \underbrace{\alpha \overline{q} - e}_{Gain\ from\ Shrouding} \tag{15}$$

If the effect of the intervention is large enough, the losses suffered by a firm become greater than the profit from shrouding. Thus, firms have an incentive to reveal the true value of the product.

Some key facts emerge from Equations (14) and (15). The increase in the cost of substitution e leads to lower gain from shrouding, thus making unshrouding more likely after the education intervention. The higher tolerance for the hidden value-discount, $\overline{q}$, on the other hand, increases the gains from hiding the true values, requiring a higher effect of education to change a firm's pricing. Lastly, the threshold value increases in the "before-education" share of myopic consumers in the economy, α. That is, if the starting level of sophistication is low, the education intervention has to be more effective to change market equilibrium.

While interventions can do little to affect $\overline{q}$, well-designed technology-enabled interventions can lower e, thus improving the prospects of an unshrouded equilibrium in the economy.

In the next section, we present a new and enhanced financial education intervention for a shrouded-value product market. We examine the effectiveness of the intervention in educating consumers and evaluate its potential in transforming the market from shrouded to unshrouded value equilibrium.

3   Financial Education Intervention

Section 2 provides a framework to assess how large the effects of financial education ought to be for it to generate positive welfare effects. However, before evaluating the externalities of the financial education intervention, it is important to guarantee that it provides the necessary skill and knowledge to consumers who become educated. The evidence on the effectiveness of financial education is at best mixed, with education leading to improvements in knowledge, but failing when decision-making is involved.[17]

Most financial education interventions provide elementary knowledge and do not provide contextual lessons required to make specific purchase decisions. Such additional knowledge is necessary to enable households to unshroud relevant product features, evaluate the products in terms of households' needs, and infer from high-powered incentives for brokers and agents that the product may be sub-optimal (Anagol, Cole, and Sarkar 2017, Sane and Halan 2017). We present a new, product-specific education intervention that provides consumers with rules of thumb to help them easily evaluate a financial product with shrouded value. We find that our intervention has significant positive ef-

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[17]An extensive review of the work on the effects of financial education on decisions can be found in the meta-analysis in Kaiser, Lusardi, Menkhoff, and Urban (2020) and Fernandes, Lynch Jr, and Netemeyer (2014).

fects, such that consumers can unshroud the true product value. They say "No" to a sub-optimal product and are more inclined to purchase a better product.

3.1 The Setting: Endowment Insurance

We test the role of our rules of thumb-based product-specific financial education on the intention to purchase a bundled product known as endowment insurance in India.[18] This type of product offers a combination of life insurance and savings and is a poster product for a product market with shrouded-value. The information brochures for these products are generally complex. Typically, such documents are rife with technical terms and are couched in legal formulations.[19] Sales brochures also often overstate the value of the product. For instance, product brochures showcase returns by saying they "will be 200% of sum assured in 15 years", thus computing returns to a number other than to the amount invested and making them look large. Despite the suboptimality of endowment insurance products, they make up a large portion of the life insurance market in India (Halan 2020) and affect consumer welfare.

The extent of shrouding can be demonstrated through a comparison of an endowment insurance product and its replicating portfolio. At the core of the endowment product is a combination of an insurance component and a savings component. Each can be purchased independently by a consumer in India. The insurance component can be replicated by purchasing a term insurance plan with a similar payoff function and the savings component can be replicated using a widely popular savings product, known as the public provident fund, which has identical tax implications as it is for the endowment insurance contract.

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[18]Anagol, Cole, and Sarkar (2017) provide an extensive overview of the Indian insurance market.

[19]See, for instance, the information provided in a sales brochure for one of the endowment products sold by the largest insurance provider in India: https://www.dropbox.com/s/75kxfxyl3usqktw/LICSalesBrochure.pdf?dl=1.

To illustrate the nature of returns on investment in endowment plans and in purchasing term insurance alongside a saving in the PPF, we collected the premiums required by a male, non-smoking adult for an endowment insurance product, term insurance product, and the public provident fund investments. Holding the payout in the event of death to be the same (₹600,000), we compute the gains from the strategy of investing the difference between endowment and term products premiums in the PPF scheme for 15 years.[20] Online Appendix B presents the details of the specific products from the Indian market used to arrive at this representative estimate.

Figure 1 plots the implied rates of return for the endowment product and the term insurance + PPF products for the ages of 30, 40, 50, for male, non-smoking adults in India, with and without a bonus. The figure shows that at no point in the age distribution is the guaranteed gains (without a bonus) from investing in the endowment product higher than the returns from investing in a combination of PPF and term insurance. The differences in the internal rates of return between term + PPF and endowment product are non-trivial. At the ages of 30, 40, and 50, these are 6.56%, 6%, and 4.74% per annum respectively. The gap in gains shrinks due primarily to an increase in the term insurance premiums with age, and, as a consequence, a reduction in a PPF investment.

Endowment insurance plans often promise additional benefits in the form of a simple bonus (annual). The size of the bonus depends on the sum assured and is not compounded. In this specific example, over the past three years, the simple bonus was equal to ₹43 for every ₹1,000 sum assured (or 4.3% of the amount assured).[21] Assuming that the bonus accrues for every year of the policy's life, at the maturity of the endowment contract the bonus would amount to ₹387,000, substantially improving the returns from

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[20]This is the minimum and closest period of maturity available in the market.

[21]Simple reversionary bonus information can be found here https://www.licindia.in/Customer-Services/Bonus-Information. Note that this type of information is typically not a part of the consumers' information set.

the endowment insurance. With the bonus, the internal rate of return from endowment insurance increases to 6.19% for a 30-year old individual, which is still 1.8 percentage points lower than the return from the combination of term insurance and PPF savings. Importantly, however, the bonus payments are not guaranteed and should be heavily discounted, if not excluded, from the endowment product return calculations.

The endowment product is overpriced and sub-optimal compared to the replicating portfolio that consists of term insurance and a risk-free saving product. On top of this, some features, such as cover and terms of surrender of the endowment insurance plan are also problematic. For example, a single-earner household with dependents and an annual income of ₹250,000 may need about 10 times its annual income as an insured sum. The annual premium for a term product with this amount of cover is ₹7,675 (16 years, 30-year-old male, non-smoker). To obtain the same amount of cover through an endowment product would require that the household invests all its annual income into the plan, raising questions of whether the cover is even actuarially fair. As for the terms of surrender, like other bundled products, the endowment insurance penalizes lapsed policies more strongly than other products, such as term insurance.

This example reveals at least four questions that households ought to ask before deciding on an insurance product. They need to think about how much cover they want, whether the return is guaranteed (and, if so, what the guaranteed return is), what is the difference between the nominal and the real rates of return, and lastly, what are the terms of surrender and the process of claiming insurance. These observations form the core of our intervention strategy proposing rules of thumb for households to evaluate insurance products.

3.2 The Experiment

The experiment consists of a randomized control trial with one control group and two treatments. The intervention to these groups (discussed later) is an information video and sheet delivered in person to the household's residence. The contents of the video and sheet vary across the three groups. The marginal difference in the information provided to Groups C, T1, and T2 of the households in our research design allows us to identify the effect of rules of thumb (T1) separately from rules of thumb alongside an explicit evaluation of the product (T2).[22]

The intervention video and sheet for the control group (C) contain general information on why insurance matters and pay more attention to the standard disclosure made during a sale. The video is in Hindi, the language all our households are most comfortable with. In addition to the information provided to Group C, the first treatment group (T1) receives information on specific questions that they should ask before making purchase decisions. This involves the four areas described in Section 3.1: cover, guaranteed and non-guaranteed components of endowment insurance contracts, nominal and real returns for bundled insurance products, and, lastly, surrender clauses. The second treatment group (T2) receives all of the information provided to Groups C and T1 along with a direct comparison of the endowment product to alternatives in the market.[23] Additionally, T2 is provided with a direct example explaining the replicating portfolio and unshrouding the product value with an explicit evaluation. All the groups are offered the same endowment insurance product as an information brochure and as a video.[24] This product is called "Jeevan Mitr", mimicking a popular endowment product sold in India and is presented

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[22]Ethics approval was sought and obtained from the University of Warwick: Approval Number HSS 56/18-19 AM01. AEA RCT Registry details: https://www.socialscienceregistry.org/trials/4224.

[23]The control group intervention video can be viewed at https://youtu.be/E_HNgVSQCKo. The T1 group intervention video is available at https://youtu.be/CGy8lOGfG_Y. The T2 group intervention video is available at https://youtu.be/j7uBg2sobkI.

[24]The product video is available at https://youtu.be/bT24YnlfyfY.

in the same way insurance agents sell them in India.[25]

We follow up with all individuals via a phone survey pitching a term insurance product widely available on the market without ascribing the call to the project. This interaction was conducted with interviewers who did not make the first two visits and who were trained separately. After recording the responses over the phone, the interviewers mentioned this was a follow-up call as a part of the same study the individuals had consented to participate in. This design allows us to measure household responses independently of the first two visits and creates a test closest to a real-world setting. Furthermore, the phone survey allows us to check whether our intervention could improve the demand for an objectively better insurance product in the market. Finally, the phone interviewers documented whether the household was distracted, was busy, or was in a noisy environment during the conversation, which enables us to measure participation and attrition in a precise manner.

Online Appendix C documents the details of the information content in each experiment. Broadly, if the interventions are successful, an endowment product will seem less attractive to households. Moreover, a term insurance product will attract greater interest from households. We posit that the information provided to households generates instrument-specific knowledge, which then enables households to use rules of thumb. By using these rules of thumb, households can unshroud product features when a product is presented to them, thereby adjusting their purchase decisions.

The experiment consists of the following key stages: base-line survey, randomization, information intervention, end-line survey, and follow-up phone survey. The base-line

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[25]To design the video, we researched how insurance agents sell their product by asking an agent in Delhi to pitch the product. The information brochure uses the same typeset, colors, language style, and information as in the video. All households were given a copy of the information sheet and could review the video and the sheet even after the household visit was complete. The intervention video was 1:00, 3:34, and 4:50 minutes long for C, T1, and T2 respectively. The product video was 3:50 minutes long for every household. A copy of the brochure was left with the household at the end of the intervention.

survey took place over four weeks, after which we randomized households into three groups (C, T1, and T2). The intervention and the end-line survey took place in one visit after the households were randomized into different treatment groups. The experiment concluded with the phone survey. Appendix Section D presents the procedures followed to conduct the experiment, respondent recruitment, sample size, attrition, and other details on the actual fieldwork conducted for this paper. We find that the randomization achieved balance across the groups and the attrition was not selective. Finally, we have a sample size of 2,838 households across C, T1, and T2 in our study.

4 Empirical Results

4.1 Estimation Strategy

The estimation strategy is an intention-to-treat (ITT) – that is, all households are analyzed with the assumption that they remained in the intervention group to which they were initially assigned. The impact of the two treatments can be evaluated by comparing outcomes across groups in a simple regression framework. For each household-level outcome, the main specification is given by:

$$y_i = \alpha + \beta_1 t_{1i} + \beta_2 t_{2i} + \gamma X_i + \sum_s \delta_s I(S = s) + \epsilon_i \tag{16}$$

where y_i denotes the outcome for household i; t_{1i} is a dummy variable equal to 1 for households in the T1 group; t_{2i} is a dummy variable equal to 1 for households in the T2 group, with the reference group as the control group C; and ϵ_i is a robust error term. The randomization is stratified on some variables.[26] To adjust our standard errors for stratification, we add a dummy variable for each stratum, with δ_s denoting the

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[26]Appendix Section D.2 details the variables by which the randomization was stratified.

randomization stratum fixed-effect. X_i represents household or respondent level controls that could potentially explain the outcome but are not influenced by the intervention. The following variables measured at base-line are used as controls in our study: age, education level, occupation, number of dependents/children, number of earning members, geographical zone, household income, assets, financial investments, insurance ownership, personal financial stability, financial literacy score, understanding of insurance, and risk and time preferences.

For each outcome variable, we present regression results with and without controls. We use the ordinary least squares (OLS) estimator for all outcomes.[27] Our outcome variables trace the various steps outlined in the previous section and are measured both at the end-line and with the follow-up phone survey.

Although questions of whether the ITT effects vary by *ex-ante* levels of conditioning variables (such as levels of general financial literacy) and by other characteristics (such as age or income) are of interest, our experiment was not powered to yield answers along these dimensions. We, therefore, relegate such investigation to future research.

4.2 Main Empirical Result: Purchase Decisions

The ultimate aim of most financial literacy programs, as well as of our intervention, is to enable households to make sensible, informed purchase decisions. In our setting, this would be to decrease the purchase (stated and revealed) of the endowment insurance product and to increase the purchase of the term insurance product. We measure these main outcomes through responses to the following two questions at the end-line and follow-up survey respectively:

1. Having been introduced to "Jeevan Mitr", would you be interested in purchasing

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[27]For binary outcomes, we also run the logit estimator and find that the results are no different from that of the OLS estimator.

this product?

2. Having been introduced to this term insurance product, would you be interested in purchasing this product?

Table 1 presents the results. We observe a decrease in the intention to purchase the endowment insurance (larger share of "no" responses) and an increase in the intention to purchase the term insurance product (larger share of "yes" responses). The results are well-aligned with our hypotheses.

We find that the rules of thumb intervention, T1, leads to a 2.9 percentage point increase in households saying no to purchasing the endowment product compared to the control group. In Column 1, without any controls, we note that this effect is on the base of the control group having 14% households that say no, making it a sizeable effect. The effect on the T2 intervention group is statistically insignificant, mainly due to a small downward revision in the magnitude of the treatment effect.

Columns 3 and 4 of Table 1 present the treatment effect on the intention to purchase the term product from the follow-up survey. We find that the T1 group has a 5.2 percentage points increase in saying yes to buying the term product than the control group. Although the magnitude of the effect is larger than the effect on purchase propensity for the endowment product, we note here that, as a percentage of the base rate of intention to purchase, the effect sizes are similar.

In line with the effect on the T2 group for the endowment product, we document that there is no effect of the second intervention video on the intention to buy the term product. However, the treatment effect magnitude is nearly zero for "Buy Term = Yes". This suggests that detailed product evaluation has a strong countervailing force against the rules of thumb intervention for households in this group, and is likely to be counter-productive.

The difference in sample size for the estimates between Columns 1 and 2 and Columns 3 and 4 stem from the fact that our interviewers could not engage in a clear phone conversation with the respondents. However, such a concern equally affected respondents across all treatment arms, laying to rest concerns of selective compliance and attrition in our data.

4.3   Mechanism: Knowledge

If our intervention leads to a change in purchase probabilities, we should see an improvement in the knowledge of our sample. We use three methods of testing whether knowledge has improved. First, we test if the respondents understood how much coverage should be purchased and how to calculate real returns. Second, we measure what features are important to households when buying insurance and whether these changed after the intervention. Third, we test whether households could correctly choose a term insurance product over an endowment product right after the intervention. Estimation of changes in knowledge would confirm whether the interventions had a significant impact on the decision to purchase (or not purchase) the insurance products.

Knowledge About Insurance Coverage and Real Returns: We measure insurance knowledge gained right after the intervention with the following questions:

1. If your income is ₹300,000 per annum, what would be the a minimum amount of insurance you would need for your family?

2. If inflation is 4% and an insurance product gives you 6%, what would be the rate of return be after deducting inflation?

Both these concepts of minimum cover and the real rate of return are explained in the T1 and T2 videos but are not mentioned in the video for control households. Based on the videos, the appropriate answers are *"greater than ₹3,000,000"* and *"2%"* respectively.

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Table 2 presents the effects of T1 and T2 intervention on knowledge of cover (Column 1) and the real rate of return (Column 2). The T1 intervention results in an 11.2 percentage point increase in correct answers on minimum cover relative to the control group – a 36.6% increase from the base rate of correct answers. Similarly, the T2 intervention results in an 8 percentage point increase, albeit a much smaller increase as a percent of the base rate of correct answers. Consistent with our other results, the difference between T1 and T2 is not statistically significant. On the real rate of return (Column 2, Table 2), we do not observe any statistically or economically significant increases in correct answers. This may be because the answer required a simple arithmetic calculation on the part of households that was easy to compute in the first place. This is reflected in the fact that 91.7% of the control group also answered correctly. While we set out to measure an increase in "knowledge", this measure is at best a noisy proxy because households may give a correct answer despite not understanding the significance of returns net of inflation.

Features of Insurance that are Important: In our study, we ask households both at the base-line and at the end-line survey the following question:

1. If/when you were to buy a life insurance policy, what product features would you look out for?

Question 1 allows us to assess the role of the intervention in the importance of various features covered by the intervention. Table 3 shows the four features covered in our intervention videos for the T1 and T2 groups of households and whether these were considered important by them *before* the intervention. We note here that all the coefficients on T1 and T2 are statistically insignificant across the four features – cover (Column 1), surrender (Column 2), bonus return (Column 3), and guaranteed return (Column 4). It is noteworthy that nearly no household selected cover as an important feature during

the base-line survey. However, 39.1% and 64.7% of the households in the control group considered surrender terms and guaranteed return, respectively, as relevant features while considering insurance. Lastly, nearly no household considered the "bonus return" – non-guaranteed returns from investment – as a feature they would look out for, suggesting that households tend to be blind-sided by contracts like endowment insurance where most of the action in terms of its viability comes from "bonuses" that are not guaranteed by the insurance company.

Table 4 shows the four features covered in our intervention videos for the T1 and T2 household groups and whether these features were considered important by households after the intervention. We observe that the fraction of households in the control group considering all four features important is statistically significant and meaningfully large. This is primarily because the control group video urges households to pay attention to *all* product features; hence households recognize that these are likely to be important when presented as features of insurance products.

Column 1 of Table 4 presents results on "cover" as an important feature of insurance products. We document a 3 (4.1) percentage point increase relative to the control group for T1 (T2) intervention groups. While the increase is only $\approx 5\%$ of the base rate relative to the benchmark results *before* the intervention presented in Table 3, this is a substantial increase in the knowledge of insurance features. Additionally, the importance of surrender increases by 2.1 and 1.9 percentage points for T1 and T2 respectively, although it is statistically insignificant. Lastly, the bonus return (Column 3) and guaranteed return (Column 4) features bear significant patterns after the intervention. The T1 and T2 interventions cause meaningfully large increases in the importance of looking out for bonus returns, with 5.1 and 2.4 percentage points respectively. However, the T2 intervention effect is statistically insignificant and substantially lower than the effect for the T1 group, suggesting that the product comparison may not have helped households

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recognize the importance of the bonus feature in insurance products. Correspondingly, the role of guaranteed return is negative, though statistically insignificant. This suggests that households recognize that all the action may be in the bonus feature as opposed to the guaranteed return feature that is highlighted and marketed in endowment insurance contracts.

Hypothetical Choice Between Products: After the educational video and *before* we introduce "Jeevan Mitr", we measure whether households are able to discern an endowment insurance product from a term insurance product before measuring the knowledge gained by households. We ask the household to choose between an endowment and term product when cover, guaranteed return at maturity, and the premium costs are clearly high-lighted. The question asked is as follows:

1. If you were in a situation where you could choose to buy only one of the following products (endowment or term), what would you pick? (answers: endowment, term, don't know)

	Endowment	Term
Cover	₹185,000	₹2,500,000
Guaranteed money at end	₹170,000	₹0
Policy term	15 years	15 years
Annual premium	₹15,600	₹4,300
No. of years to pay	10	15
Total premium	₹156,000	₹64,500

Columns 1 and 2 of Table 5 present results on endowment insurance as a preferred choice for households, with and without controls. The T1 intervention led to a 6.4 percentage points *decrease* in endowment insurance being the preferred choice – 13.7% of the base rate of preference for endowment insurance. The T2 intervention led to a 6.6

percentage points reduction in endowment insurance being the preferred choice – 14.1% of the base rate of preference for endowment insurance. The difference in treatment effects between T1 and T2 in Column 1 are not statistically or economically meaningful. However, the difference is large, but statistically insignificant once controls are introduced (Column 2). The lack of difference in treatment effects between T1 and T2 suggests that product comparison – the only component that differentiates the first intervention from the second – has little role to play in the estimated effects.

Columns 3 and 4 of Table 5 present the results on the preference for term insurance. Households in T1 intervention show 4.9 percentage points (11% of the base rate) higher interest in a term insurance product. T2 group households increase their interest in term insurance product by 6 percentage points (Column 3). However, the difference between T1 and T2 is not statistically significant, even with additional controls (Column 4). It is also important to note that the percentage of households in the control group preferring term insurance is much higher than the unconditional estimates of insurance ownership in India. This in part reflects the conditional sample used for the study (due to our eligibility criteria) and the fact that our video for the control group provides generic information about insurance that is otherwise unavailable to a large majority of Indian households.

Two distinct and relevant facts emerge from these estimates. First, we observe that our intervention videos help a reasonably meaningful fraction of households reject endowment insurance and be more inclined to purchase term insurance. Second, we observe that additional explicit product comparison does not meaningfully enhance the effect of the rules of thumb treatment, suggesting that providing detailed product comparison does not improve knowledge beyond that which could be achieved using the rules of thumb intervention.

This observation is consistent with the literature in that financial education does improve knowledge. However, our object of interest goes beyond just generating knowledge, but whether such knowledge, in the face of a well-pitched shrouded financial product can aid consumers to make better purchase decisions. In the next section, we measure whether our intervention aids consumers to unshroud product features when they are presented to them.

4.4   Mechanism: Unshrouding

Unshrouding Product Information: Our theory of change assumes that, once the household has gained knowledge on insurance, it will be better able to understand an insurance product and potentially unshroud the exact product features. We test this hypothesis by asking questions regarding the features of our product, "Jeevan Mitr".

Table 6 shows whether respondents were able to uncover five specific product features included in the product description. The T1 group focuses on bonus return, return net of inflation, cover, and surrender terms, which is consistent with Tq-treatment effects on knowledge. The T1 group is 5.7 percentage points and 4 percentage points more likely to get correct answers on bonus return and overall return net of inflation compared to the control group, while the T2 group does not show a significant effect. Column (6) of the table presents the effect of treatments on the overall score of correct answers and establishes that households in the T1 group are more likely to successfully unshroud product features than households in the T2 group, relative to the control group. However, while households seem to effectively uncover features such as bonus return and return net of inflation, the effects of treatments on unshrouding the cover and surrender terms, though positive, are not statistically significant.

The fact that households in the T2 intervention see no significant unshrouding raises

important questions about the role of detailed product evaluation. One may argue that such an explicit comparison of products is meant to bypass the need for households to evaluate the implications of unshrouded features by themselves, thereby lowering cognitive expectations on them. However, we believe that the opposite may be true: T2 is more cognitively demanding or too complex for households to process while making purchase decisions.

To summarize, the results show that the T1 intervention is effective in decreasing the demand for the endowment insurance product and in increasing the demand for term insurance. It significantly improves the knowledge of consumers and helps them understand and unshroud the product features. The T2 intervention, although it generates knowledge, fails to unshroud "Jeevan Mitr" product features and has no significant effect on the intention to purchase the product.

5   Estimating Effectiveness

The results of the randomized experiment show that our financial education intervention leads to a significant improvement in the financial decision-making for consumers. Besides, based on the evaluation framework set up by Kaiser, Lusardi, Menkhoff, and Urban (2020), our intervention proves to be scalable, inexpensive, and easy to roll out, making it a feasible approach to product-specific financial education.[28] In this section, we evaluate our education design, and those in the literature using our welfare framework.

Our welfare framework shows that third-party financial education can be an effective measure to combat sub-optimal financial products only when the intervention effect is large enough. The threshold for effective financial education intervention, $\gamma^\star$, as well as equilibria in the economy before the educational intervention, depend on two parameters:

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[28]More details regarding the intervention evaluation can be found in Appendix E.

the ratio between the price of substitution and the maximum possible value discount, $\frac{e}{q}$, and the share of myopic consumers before the intervention, α.

Figure 3 presents the equilibria at all possible levels of the two parameters. On the x−axis, this figure plots the fraction of myopic consumers. One may think of α as the proxy for the extent of uninformed consumers in different countries or specific product markets. As this value increases, the likelihood of an unshrouded equilibrium without any financial education is reduced to zero. On the y−axis, this figure plots $1 - \frac{e}{q}$, the minimum achievable hidden value discount. As this value increases, the likelihood of an unshrouded equilibrium without any financial education is reduced to zero. For example, when 60% of the consumers in a product market (or an economy) are myopic and the cost of substitution is 60% cheaper than the maximum value discount, the required effect of the intervention is about 50%. That is, financial education has to increase the share of informed consumers by 50% of the initial level to achieve an unshrouded equilibrium.

The goal of financial education is to increase the region of unshrouded equilibrium for various parameter values. The shaded regions from dark blue toward yellow map the value of $\gamma^{\star}$ (the minimum effect size required from financial education) to move away from a shrouded equilibrium. Beyond yellow, the sky-blue color maps the region in where the education effect has to be greater than 100%, i.e. the education has to at least double the fraction of informed consumers to achieve unshrouded equilibrium. The region in red is the gain from our financial education experiment. Our experiment demonstrates that educational intervention increases the number of individuals not buying a suboptimal product by 3 percentage points, which is equivalent to $\gamma = 0.083$ or 8.3%.

In their meta-analysis of financial education RCTs, Kaiser, Lusardi, Menkhoff, and Urban (2020) show that the maximum effect of the educational intervention on financial

behavior is equal to about 12 percentage points.[29] If an intervention has an effect of that magnitude in our setting, we would observe an increase in the share of sophisticated consumers by about 33% and would see the "effective zone" of the education widens.

A direct evaluation of the interventions with significant effects on decision-making in insurance markets from the meta-analysis by Kaiser, Lusardi, Menkhoff, and Urban (2020) with our criteria shows that two out of three financial education RCTs in the insurance market would lead to the product features unshrouding, assuming reasonable parametrization.[30]

The main takeaway from this exercise is that our treatment effect of 3 percentage points can potentially help move away from a shrouded equilibrium and toward an un-shrouded equilibrium. As discussed in Gabaix and Laibson (2006) and Kosfeld and Schüwer (2017), the form and the scope of education provided are very important. Third-party consumer education should be unbiased and should not be profit-motivated. We should nevertheless be careful and keep in mind that "not enough" education, even with significant effects, can have unintended consequences. The nature of changes to equilibrium information provision in markets is an important consideration while evaluating the role of financial education.

6 Conclusion

Mistakes made by households in their financial portfolios are ubiquitous. These are exacerbated by the aggressive sale of retail financial products with shrouded product attributes, which, while profitable to the companies, bring little benefit to households. This problem is particularly damaging, not only in terms of monetary losses borne by

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[29]For a group called "Youth (age 14 to 25)". The result is presented in Table 2 on page 39 of their working paper.

[30]The details on paper selection, comparison procedures and results are provided in Appendix F.

consumers but also in terms of eroding trust in markets in contexts where households are naive and have little experience with financial products. Without adequate financial literacy, households face enormous information and knowledge constraints when arriving at financial decisions.

Financial literacy, therefore, forms the bedrock of any policy and financial entrepreneurial agenda concerning household balance sheets. Yet academic research on the impact of financial literacy on financial decision-making remains inconclusive. It is important to design education such that individuals can apply lessons from it when faced with complex financial products with hidden features. Our paper introduces product-specific financial education and breaks new ground in delivering and evaluating financial education.

In this paper, we question what the market implications of such a financial education intervention would be, especially when those that remain unaffected by the education continue to exist. We construct a model of a financial product market with shrouded value. Using the model, we defined how large the educational impact should be to change the market pricing and what the consequences of "not enough" education would be.

We continue with the design and implementation of two-treatments financial education intervention – the rules of thumb intervention (T1) and the rules of thumb intervention with product comparison (T2) – in Delhi, India. Our intervention focuses on bundled insurance products that provide both savings and insurance. Our T1 treatment resulted in a 3 percentage point decline in the intention to purchase (the inferior) endowment insurance relative to the control group. It also resulted in a 5.6 percentage point increase in the intention to purchase the (superior) term product. Our T2 treatment resulted in similar magnitudes of decline in the intention to purchase endowment insurance, although not statistically significant on the margin. A product-specific rules of thumb approach has the potential to improve purchase decisions by meaningful magnitudes.

We conclude with an evaluation of our intervention and the most effective interventions on insurance markets from the existing literature with our theoretical framework. The model suggests that the magnitude of our intervention has the potential to change the equilibrium in the market, albeit marginally. However, it also shows that "not enough" education, even with statistically significant effects, can be harmful to the market – that is, for those that get left behind. This group is worse-off. The nature of changes to equilibrium information provision in markets is an important consideration when evaluating the role of financial education.

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Tables

Table 1 Purchase Decisions

| | *Dependent Variable* | | | |
| | Buy Endow = No | | Buy Term = Yes | |
	(1)	(2)	(3)	(4)
T1	0.029*	0.030**	0.052*	0.056**
	(0.015)	(0.015)	(0.027)	(0.027)
T2	0.025	0.023	−0.005	−0.005
	(0.015)	(0.015)	(0.026)	(0.026)
Constant	0.140**	0.359***	0.292***	0.157
	(0.054)	(0.096)	(0.082)	(0.158)
Controls	No	Yes	No	Yes
Observations	2,838	2,838	1,650	1,650
Adjusted R^2	0.089	0.096	0.022	0.019

This table presents the results for OLS estimation of Treatment 1 (T1) and Treatment 2 (T2) effects on purchase of the insurance product. Columns (1) and (2) present the results for intention to purchase the endowment product. The dependent variable is equal to 1 if a household responded "NO", and 0 otherwise. Columns (3) and (4) present results from the follow-up survey for intention to purchase the term product. The dependent variable is equal to 1 if a household responded "YES", and 0 otherwise. Controls include age, education level, occupation, number of dependents/children, number of earning members, geographical zone, household income, assets, financial investments, insurance ownership, personal financial stability, financial literacy score, understanding of insurance, and risk and time preferences. The significance levels are described in the following way: *p<0.1; **p<0.05; ***p<0.01.

Table 2 General Insurance Knowledge

	Dependent Variable	
	Minimum Cover	Real Rate of Return
	(1)	(2)
T1	0.112***	0.023
	(0.022)	(0.015)
T2	0.080***	0.018
	(0.021)	(0.015)
Constant	0.306**	0.917***
	(0.135)	(0.096)
Controls	Yes	Yes
Observations	2,838	2,838
Adjusted R^2	0.135	0.100

This table presents the results for OLS estimation of Treatment 1 (T1) and Treatment 2 (T2) effects on knowledge of cover (Column 1), and the real rate of return (Column 2). Controls include age, education level, occupation, number of dependents/children, number of earning members, geographical zone, household income, assets, financial investments, insurance ownership, personal financial stability, financial literacy score, understanding of insurance, and risk and time preferences. The significance levels are described in the following way: $^*p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Table 3 Insurance Features Importance at Base-line

	Cover	Surrender	Bonus Return	Guaranteed Return
		Dependent Variable		
	(1)	(2)	(3)	(4)
T1	0.003	0.002	0.015	−0.001
	(0.023)	(0.017)	(0.020)	(0.022)
T2	0.017	−0.018	0.020	−0.022
	(0.022)	(0.017)	(0.019)	(0.022)
Constant	0.668*	0.391*	−0.103	0.647*
	(0.140)	(0.106)	(0.122)	(0.140)
Controls	Yes	Yes	Yes	Yes
Observations	2,838	2,838	2,838	2,838
Adjusted R^2	0.038	0.119	0.079	0.083

This table presents OLS estimation results for the perceived importance of four product features before the intervention. The dependent variable is 1 if you consider a feature important before the intervention and 0 otherwise. The four features are Cover (Column 1), Surrender Terms (Column 2), Bonus Return (Column 3), and Guaranteed Return (Column 4). Controls include age, education level, occupation, number of dependents/children, number of earning members, geographical zone, household income, assets, financial investments, insurance ownership, personal financial stability, financial literacy score, understanding of insurance, and risk and time preferences. The significance levels are described in the following way: *p<0.1; **p<0.05; ***p<0.01.

Table 4 Insurance Features Importance at End-line

	Cover	Surrender	Bonus Return	Guaranteed Return
			Dependent Variable	
	(1)	(2)	(3)	(4)
T1	0.030	0.021	0.051***	−0.015
	(0.023)	(0.015)	(0.015)	(0.022)
T2	0.041*	0.019	0.024	−0.033
	(0.022)	(0.015)	(0.015)	(0.022)
Constant	0.563***	0.298***	0.327***	0.242*
	(0.141)	(0.094)	(0.094)	(0.137)
Controls	Yes	Yes	Yes	Yes
Observations	2,838	2,838	2,838	2,838
Adjusted R^2	0.032	0.010	0.019	0.036

This table presents OLS estimation results for the effect of Treatment 1 (T1) and Treatment 2 (T2) on the perceived importance of four product features. The dependent variable is 1 if you consider a feature important after the intervention and 0 otherwise. The four features are Cover (Column 1), Surrender Terms (Column 2), Bonus Return (Column 3), and Guaranteed Return (Column 4). Controls include age, education level, occupation, number of dependents/children, number of earning members, geographical zone, household income, assets, financial investments, insurance ownership, personal financial stability, financial literacy score, understanding of insurance, and risk and time preferences. The significance levels are described in the following way: *p<0.1; **p<0.05; ***p<0.01.

Table 5 Choice Between Endowment and Term Insurance

	Dependent Variable			
	Choose = Endowment		Choose = Term	
	(1)	(2)	(3)	(4)
T1	−0.064***	−0.059***	0.049**	0.048**
	(0.022)	(0.022)	(0.020)	(0.020)
T2	−0.066***	−0.067***	0.060***	0.061***
	(0.022)	(0.022)	(0.020)	(0.020)
Constant	0.466***	0.382***	0.410***	0.506***
	(0.079)	(0.138)	(0.072)	(0.126)
Controls	No	Yes	No	Yes
Observations	2,838	2,838	2,838	2,838
Adjusted R^2	0.074	0.095	0.056	0.074

This table presents the results for OLS estimation of Treatment 1 (T1) and Treatment 2 (T2) effects on the choice for the preferred type of insurance. Columns (1) and (2) present the results for endowment insurance as the preferred choice. The dependent variable is equal to 1 if a household responded "Endowment Insurance" when asked about the preferred insurance product and 0 otherwise. Columns (3) and (4) present results for term product as the preferred choice. The dependent variable is equal to 1 if a household responded "Term Insurance" when asked about the preferred insurance product and 0 otherwise. Controls include age, education level, occupation, number of dependents/children, number of earning members, geographical zone, household income, assets, financial investments, insurance ownership, personal financial stability, financial literacy score, understanding of insurance, and risk and time preferences. The significance levels are described in the following way: *p<0.1; **p<0.05; ***p<0.01.

Table 6 Unshrouding Product Information

| | Dependent Variable | | | | | |
	Guaranteed Return	Bonus Return	Return Net of Inflation	Cover	Surrender	Total
	(1)	(2)	(3)	(4)	(5)	(6)
T1	−0.018	0.057**	0.041*	0.022	0.011	0.048**
	(0.021)	(0.022)	(0.022)	(0.022)	(0.020)	(0.020)
T2	0.006	0.022	0.014	0.010	0.002	0.024
	(0.021)	(0.022)	(0.022)	(0.022)	(0.020)	(0.020)
Constant	0.305**	0.675***	0.570***	0.610***	0.040	1.053***
	(0.133)	(0.139)	(0.137)	(0.139)	(0.125)	(0.124)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,838	2,838	2,838	2,838	2,838	2,838
Adjusted R^2	0.156	0.041	0.095	0.068	0.065	0.109

This table presents the results for OLS estimation of Treatment 1 (T1) and Treatment 2 (T2) effects on the ability of respondents to unshroud five specific product features included in the product description. In Columns 1–5, the dependent variable is equal to 1 if a household defines the product feature correctly and 0 otherwise. The product features include Guaranteed Return (Column 1), Bonus Returns (Column 2), Return Net of Inflation (Column 3), Cover (Column 4), and Surrender Terms (column 5). Column 6 of the table presents treatment effects on the ability to unshroud all features at the same time. In Column 6, the dependent variable is a logarithm of the total number of features respondents find important plus 1. Controls include age, education level, occupation, number of dependents/children, number of earning members, geographical zone, household income, assets, financial investments, insurance ownership, personal financial stability, financial literacy score, understanding of insurance, and risk and time preferences. The significance levels are described in the following way: $^*p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$.

Figures

**Figure 1** Internal rate of return comparison: Endowment Insurance vs. Term + PPF
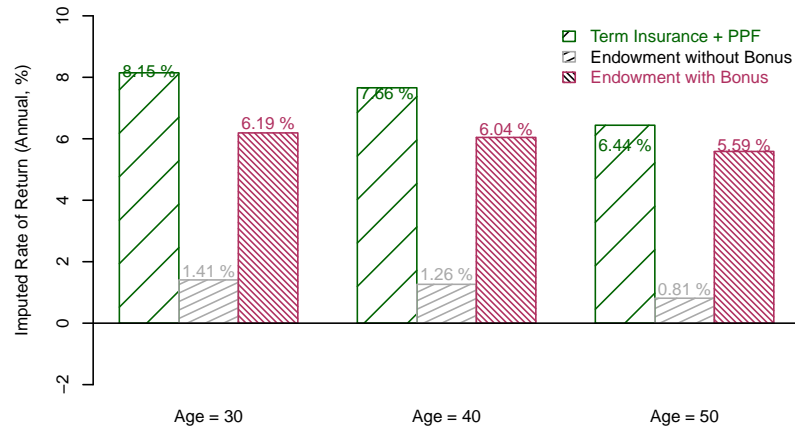
This figure presents the comparison of internal rate of return for an endowment product with bonus (in red), an endowment product without bonus (in gray), and a combination of term insurance and risk-free savings product, Public Provided Fund (in green) for a 30, 40, and 50-year-old non-smoking male with ₹600,000 sum assured and 16 years of coverage. The endowment product is modeled after the "Jeevan Labh" product from the Life Insurance Corporation of India, the largest retail insurance company in India.
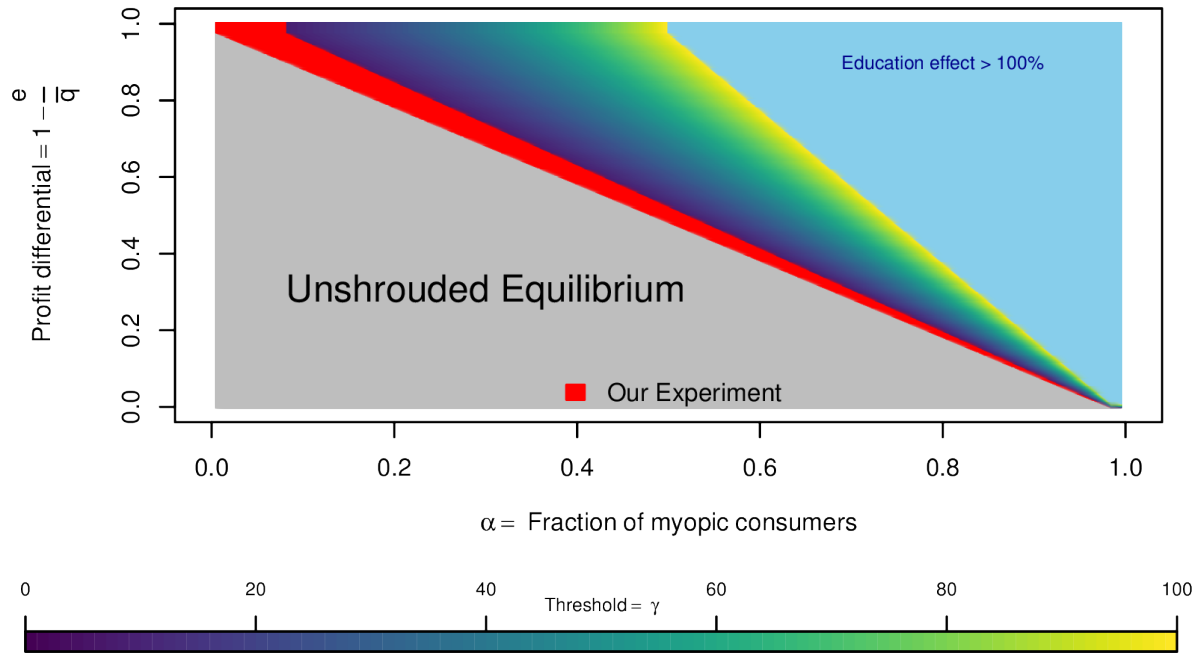
Figure 2 Experimental Design and Intervention Content
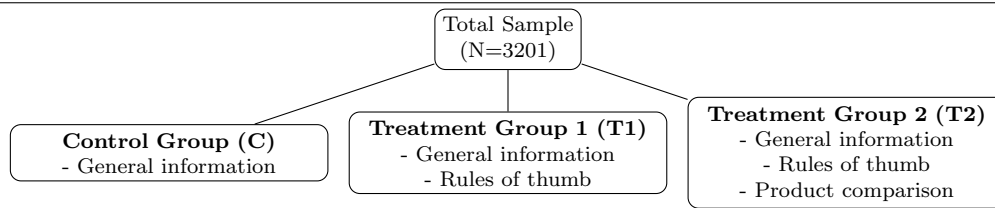
This figure presents the experimental design and the intervention content across three groups: Control Group (C), Treatment Group 1 (T1), and Treatment Group 2 (T2).

Figure 3 Effect of Financial Education and the Resulting Equilibria

This figure presents a heatmap, with the colors indicating the magnitude of the intervention effect required to achieve unshrouded equilibrium in the market. The area below the 45-degree line corresponds to Unshrouded Prices Equilibrium; the area above corresponds to Shrouded Prices Equilibrium. The heatmap is constructed in the parameter space of our model: *ex-ante* level of sophistication, α - horizontal axis, and profit differential. $1 - \frac{e}{q}$ - vertical axis. The range for the possible effect is provided in the legend at the bottom of the graph. The effect of our intervention is shown in red.

Internet Appendix

A   Proof: Proposition 1

The proof follows closely Gabaix and Laibson (2006), with the notation adjusted for our set-up. All assumptions from Gabaix and Laibson (2006) hold true.

Case 1: $\alpha > \alpha_\dagger$ and Shrouded Value Equilibrium.

If Firm i shrouds the value of the product, its profit is equal to

$$\pi = (P - V_s + \alpha q \mathbb{1}_{q \leq \bar{q}}) D(P^\star - P),$$

as the beliefs are $q = q^{star} = \bar{q}$ and the demand for the financial product of all consumers depends only on $P^\star - P$. This profit is maximized when $q = \bar{q}$ so that

$$\pi = (P - V_s + \alpha \bar{q}) D(P^\star - P).$$

The prices that maximize a firm's profit are the following: $P = -\alpha \bar{q} + V_s + \mu$ and $q = \bar{q}$.

Firm i can decide to unshroud the true value of the products. To do so, Firm i informs consumers that the true value of the savings in the product, $V_s - q$, is lower than the value stated before, V_s.

If Firm i unshrouds the true value, it educates some myopic consumers and the new share of myopes becomes $\alpha' = (1 - \lambda)\alpha$. By revealing the hidden loss, Firm i aims to attract sophisticated consumers, who in their turn will tolerate the loss only if it is lower than the cost of effort, $q \leq e$.

- If $q \leq e$, the unshrouding firm's profit is equal to

$$\pi = \underbrace{(1 - \alpha')(P - V_s + q)D(P^\star + e - P - q)}_{\text{sophisticated demand}}$$

$$+ \underbrace{\alpha'(P - V_s + q)D(P^\star - P)}_{\text{myopic demand}}$$

The demand of the sophisticated share of consumers, $(1 - \alpha')$, is equal to $D(P^\star + e - P - q)$, where $P^\star + e$ is the cost that a sophisticated consumer pays to a shrouding firm by choosing to substitute and $P + q$ is the cost that she faces at the unshrouding firm. The profit is maximized at $q = e$. Hence, the profit is equal to

$$\pi = (P - V_s + e)D(P^\star - P)$$

The following is true in the market:

$$\text{If } \alpha > \alpha^\dagger$$

$$\underbrace{(P - V_s + e)D(P^\star - P)}_{\text{Unshrouded Profit}} < \underbrace{(P - V_s + \alpha\bar{q})D(P^\star - P)}_{\text{Shrouded Profit}}$$

If the share of myopic consumers is large enough, firms do not have an incentive to reveal the true values of the products and educated consumers.

- If $q > e$, the profit of the unshrouding firm is equal to

$$\pi = (P - V_s + \alpha'\bar{q})D(P^\star - P)$$

which is strictly smaller than $(P - V_s + \alpha\bar{q})D(P^\star - P)$, the profit firm i could achieve by choosing to shroud and price at $q = \bar{q}$.

We conclude that the best response of firm i is to shroud the value of the product.

Case 1: $\alpha < \alpha_\dagger$ and Unshrouded Value Equilibrium.

Firm i can unshroud. Then:

- If $q \le e$, the unshrouding firm's profit is equal to

$$\pi = \underbrace{(1 - \alpha')(P - V_s + q)D(P^\star + e - P - q)}_{\text{sophisticated demand}}$$
$$+ \underbrace{\alpha'(P - V_s + q)D(P^\star - P)}_{\text{myopic demand}}$$

The profit is maximized at $q = e$. Hence, the profit is equal to

$$\pi = (P - V_s + e)D(P^\star - P)$$

- If $q > e$, the profit of the unshrouding firm is equal to

$$\pi = (P - V_s + \alpha'\bar{q})D(P^\star - P)$$

which is strictly smaller than $(P - V_s + e)D(P^\star - P)$, the profit firm i could achieve by choosing to unshroud and price at $q = e$.

If Firm i shrouds the value of the product, its profit is equal to

$$\pi = (P - V_s + \alpha'q\mathbb{1}_{q \le \bar{q}})D(P^\star - P),$$

as the beliefs are $q = q^{star} = \bar{q}$. One needs α' rather than α in the profit expression above because the other firms in the market unshroud, so they educate a fraction, λ,

of the myopic consumers. This profit is maximized when $q = \bar{q}$ and is equal to $\pi = (P - V_s + \alpha\bar{q})D(P^\star - P)$, which is strictly smaller than the profit firm i could achieve by choosing to unshroud and price at $q = e$.

The best response of firm i is to unshroud and price at $P = -e + V_s + \mu$ and $q = e$. $\square$

B Replicating Portfolio for Endowment Insurance

Consider the "Jeevan Labh" (Plan: 836) endowment plan of the Life Insurance Company of India (LIC), a government entity that is the largest insurance provider in India. Jeevan Labh is a premium-paying plan, where individuals can choose the number of premium-paying years depending on coverage periods. For example, 16 years of coverage implies premium payments for 10 years. Based on the cash flow, the internal rate of return from this product for a 30-year-old non-smoking adult with a sum assured of ₹600,000 is 1.41% at maturity, in addition to the insurance cover of ₹600,000 before maturity.[31]

The insurance component of "Jeevan Labh" can be replicated by the purchase of the term insurance plan Anmol Jeevan II (Plan: 822) from the same firm.[32] To obtain a relevant comparison to *Jeevan Labh*, we choose a life-cover sum of ₹600,000 for 16 years.

As an alternative for the savings component, we consider the Public Provided Fund (PPF) scheme of the Government of India, which allows individuals to invest from ₹500 to ₹150,000 per financial year either as a lump sum or through a maximum of 12 installments per year. The original duration of this scheme is 15 years, extendable for one or more

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[31]The return calculations do not take into account any bonus returns that may accrue for an individual. Bonus payments are described as "participation in profits" benefits and are not guaranteed.

[32]The Anmol Jeevan II Plan (Plan: 822) has a minimum sum assured of ₹600,000, with a minimum age of entry of 18 and maximum age of entry of 55. The policy term can vary from 5 to 25 years, and premiums can be paid at either yearly or half-yearly intervals.

blocks of three years each.[33] The PPF provides tax benefits along the same lines as endowment insurance, with a guaranteed annual interest rate of 7.9%.[34]

C Information Content in the Treatment

The Indian insurance markets govern the information contained in each of our treatment arms. The rules of thumb provided in the treatment should help households unpack the essential features of insurance contracts in India. Broadly speaking, the information provided to Groups T1 and T2, in addition to the general information provided to Group C, can be used to uncover distinct aspects of endowment insurance.

Cover: The sum of money available when the insured risk occurs is at the heart of any insurance contract. Any individual considering a life insurance contract needs to assess how much coverage he or she needs. The cover depends on the number of dependents, the number of income producers in the family, and whether the household has liabilities such as mortgages that may not be affordable if such earnings are no longer available. As a rule of thumb, we urge that households consider a cover of at least 10 times the individual's annual income while assessing insurance products.

Returns: Guaranteed and Real Returns are a vital component of decision-making in finance. Previous studies suggest that purchase decisions are significantly affected by how returns are disclosed (Shaton 2017). In guaranteed products such as endowment insurance, firms compute returns with the premium amount or the sum assured as the base. The advertised returns tend consistently to show whatever results in a higher number, typically on the annual premium. Gross returns, without any inflation adjustment, are

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[33]To replicate the term of the endowment product, we invest the differential between premiums in the PPF for 15 years and then keep the accumulated investment in the account for one more year.

[34]This was the rate of interest as of October 2019. However, this is subject to change with the Government of India annual budgets presented in February every year.

the mainstay in such information materials. Considering that the minimum time-horizon of investment is at least 16 years, inflation adjustments are sizeable and non-trivial.

While market-linked financial products have an additional component of risk adjustment to returns, we aim to keep the experiment simple; hence we only study products that have "guaranteed" returns, with no risk associated with such an investment. Being a state-run firm, the government of India fully guarantees LIC's liabilities. The "bonus" component of endowment insurance contracts depends on how "well" the company does and therefore is not a guaranteed cash flow for a contract holder. The PPF enjoys the same level of guarantee from the government as LIC. Therefore, the extent of risk in these products is the same.

As a rule of thumb, we suggest that households enquire about the nature of returns (guaranteed or not) and think about whether such returns are nominal or real.

Early Exit: The provisions related to early exit may make it very expensive to quit the product before its duration is over. This feature is vital as there may be occasions when the customer is unable to pay for a few years or wants to surrender the product entirely. The repercussions of missed payments or early exit should be known to the customer.

There are generally two costs associated with an early exit. First, the policy-holder loses the tax deduction if the product is redeemed earlier than the prescribed lock-in. Second, he or she faces additional costs in the form of surrender charges in the case of an early exit. In an endowment product, the policy-holder would lose the tax benefit if he or she lapses the policy after two years for policies with a tenure of 10 years or less, and after three years for longer-term plans. Polices lapsed in the first two years generally return nothing. Policies surrendered after year two years could return between 30% and 40% of premiums paid until year four. As a rule of thumb, we highlight that households should enquire and learn about penalties for an early exit, as well as surrender terms and

conditions.

Explicit Product Evaluation: Individuals may need to consider alternative products with the same (if not a better) outcome along the shrouded dimensions, risk coverage, and savings than the bundled product. Such alternatives are hardly discussed during the sale of any endowment insurance product. While agents are typically trained to talk about similar products sold by competitors, they do not veer into other types of financial products or a combination of products that could provide the same outcome.

In the case of the endowment insurance, the alternatives are straightforward: a combination of term insurance and a guaranteed deposit of some kind with the same risk coverage and a pay-out at the maturity as the bundled product. Clarifying such an alternative may help individuals recognize the cost of shrouded attributes for a bundled product.

D Experiment Details

This section presents the details of how the experiment was designed, and conducted in Delhi, India.

D.1 Recruiting Households and Base-line Survey

We divided Delhi into four zones – North, South, East, and West. In each of the zones, households were recruited based on a random sampling strategy, with each surveyor following a right-hand rule in a given location and knocking at every fifth household on his path. In the recruitment conversation, surveyors were asked to determine whether they fulfilled the eligibility criterion with appropriate consent. Household heads that were between 20 and 55 years old with a net individual salary of between ₹250,000 and

₹500,000 per annum and had dependents (currently married, or at least one under-18 child, or at least one retired parent) were recruited for the study. At this stage, we also ensured that these households would be available in the city during the period of study.

Once a household was eligible, we conducted the base-line survey and gathered information on household composition, demographics, income band, investment and asset market participation, general financial literacy, and specific questions on experience with retail insurance markets such as past and current participation, understanding of insurance, risk preferences, and rate of time preference.

Sample size: The minimum effect size, i.e. the difference in the probability of insurance take-up between any two groups, detectable by the experiment was 0.035 (3.5 percentage points). Based on our power calculations, we needed 1,000 households in each group to detect an effect of 3.5 between any two groups. In the power calculations, the probability of take-up in the control group in our target population was 0.10 – the unconditional insurance take-up rate in the All India Debt and Investment Survey as of 2012 (Badarinza et al. 2016).

Our final recruited sample was 3,201 households, over-sampled by 6.2%, to allow for potential attrition in the subsequent stages of the experiment.

D.2   Randomization and Balance Across Treatment Arms

We divided all households equally into three treatment arms – C, T1, and T2 – by randomly allocating households using base-line data. We followed a household-level randomized control trial design and did not cluster treatment, as there are minimal spillover concerns in our design.

The randomization exercise was stratified by geographical zone, age, prior insurance ownership, stated preference for insurance, and an index of household type. This index

of household type consisted of the first principal component of low/high financial literacy score, low/high risk preference, low/high time preference, income bins, a self-reported measure of financial stability, employment type (self-employed or salaried), gender, education, number of dependents, and number of earning members in the household.

A critical element of a well-designed randomized experiment is the element of balance across the various groups. Panel A of Table D.1 presents the OLS estimates of predicting treatment using an array of respondent characteristics. The overall model fit suggests that the experiment was well-randomized. Panel B, Table D.1, conducts an alternative test of whether there was significant predictability of treatment assignment using a multinomial logit estimator. The probability of rejecting the null of no differences between a model with survey covariates compared to a base-line model without any covariates (last row of Panel B, Table D.1) suggests there was no significant predictability in the treatment assignment. The randomization design was robust and the treatment effects estimated in this study were indeed causal.

D.3 End-line and Follow-Up Phone Survey

After randomization, the second visit to households took place. During the second visit, households in the three treatment arms watched the appropriate intervention video. Surveyors then documented their responses to questions designed to test on the video contents.

After the intervention and the questionnaire on the video contents, "Jeevan Mitr" was introduced. The product pitch focused more on the returns of the product (as is typical in sales practices in India) without specifying what was guaranteed and without emphasizing the amount of cover accompanying the product. The last set of questions measured households' interest in purchasing the product and whether they were able to

Table D.1 Balance Test

Panel A: Joint Test of Orthogonality (OLS)

	Dependent Variable	
	Treatment 1	Treatment 2
Age (in years)	−0.001 (0.002)	0.001 (0.002)
I(Female)	0.043 (0.085)	0.003 (0.087)
Education: UG	−0.009 (0.026)	−0.010 (0.026)
Education: Diploma	−0.060 (0.078)	−0.054 (0.077)
Education: Postgraduate or above	0.008 (0.055)	0.026 (0.053)
Occupation: Self-employed	0.024 (0.025)	0.005 (0.025)
Zone: North	0.031 (0.041)	0.066 (0.040)
Zone: South	0.007 (0.036)	−0.014 (0.036)
Zone: West	−0.011 (0.036)	0.006 (0.036)
Zone: East		
No. of dependents in family	0.001 (0.013)	−0.016 (0.012)
No. of earning members in family	−0.016 (0.016)	−0.003 (0.015)
Asset Index: Low	0.001 (0.028)	−0.001 (0.028)
Asset Index: Medium	0.007 (0.044)	−0.041 (0.044)
Financial Assets Index: Low	0.012 (0.030)	0.020 (0.030)
Financial Assets Index: Medium	−0.012 (0.038)	0.013 (0.037)
I(Own Insurance)	−0.003 (0.029)	−0.002 (0.029)
Financial Stability: Unstable	−0.085 (0.074)	−0.030 (0.076)
Financial Stability: Somewhat stable	−0.077 (0.075)	−0.019 (0.076)
Financial Stability: Stable	−0.034 (0.073)	−0.042 (0.076)
Financial Stability: Very stable	−0.017 (0.086)	−0.105 (0.090)
I(Has a loan)	0.044 (0.036)	0.068* (0.036)
Financial Literacy Score	−0.139 (0.294)	−0.516 (0.360)
Insurance Knowledge: 'Not Term'	−0.034 (0.026)	−0.022 (0.026)
Insurance Knowledge: 'Term'	−0.051 (0.039)	−0.030 (0.039)
Insurance Knowledge: 'Cover is important'	−0.028 (0.028)	0.009 (0.028)
Risk loving: Yes	0.006 (0.024)	0.021 (0.024)
Patient: Yes	−0.052 (0.035)	0.024 (0.034)
patient1	−0.033 (0.025)	0.003 (0.025)
Constant	0.615*** (0.118)	0.474*** (0.116)
Observations	1,864	1,898
R^2	0.011	0.011
Adjusted R^2	-0.004	-0.004
Residual Std. Error	0.501 (df = 1835)	0.501 (df = 1869)
F Statistic	0.721 (df = 28; 1835)	0.730 (df = 28; 1869)

Panel B: Joint Test of Orthogonality (Multinomial Logit)

Statistic	N	Mean	St. Dev.	Min	Pctl(25)	Pctl(75)	Max
Resid. df	2	5,646.000	39.598	5,618	5,632	5,660	5,674
Resid. Dev	2	6,211.697	32.034	6,189.045	6,200.371	6,223.023	6,234.349
Df	1	56.000		56.000	56.000	56.000	56.000
LR stat.	1	45.303		45.303	45.303	45.303	45.303
Pr(Chi)	1	0.846		0.846	0.846	0.846	0.846

This table presents test results for how balanced the experiment was across the various groups. Panel A presents the OLS estimation predicting the type of treatment (T1 or T2) using respondent characteristics. Panel B presents the results for a multinomial logit estimation of treatment assignment predictability. The significance levels are described in the following way: *p<0.1; **p<0.05; ***p<0.01.

unshroud the product features.

At the end of the second visit, the surveyors were required to fill in "exit forms" where they took notes on whether the household had watched the intervention video in its entirety and whether there were any notable distractions (disturbances) during the intervention.

As a last step in the study, households were followed up with a phone survey pitching a term product available widely in the market without ascribing the call to the project. This interaction for three to four minutes on the phone was with surveyors who did not make the first two visits, were trained separately, and had not had any direct prior contact with the respondents. Once the phone surveyor had recorded the household responses, they mentioned this was a follow-up call as part of the same study in which the households had consented to participate. This design allowed us the benefit of measuring household responses independently of the first two visits, as a test closest to a real-world setting. Not only did this have the advantage of being very close to a real-life setting; it also allowed us to check whether our intervention could improve demand for what was objectively a better insurance product on the market. Finally, the phone surveyors also documented whether the household was distracted, were in a noisy environment, or were busy, which enabled us to measure participation and attrition in a precise manner.

D.4 Sample Attrition

Table D.2 Phone Survey: Compliance Test

	Dependent Variable			
	Treatment 1		Treatment 2	
Compliance	0.00005	−0.010	−0.005	−0.004
	(0.026)	(0.027)	(0.025)	(0.027)
Constant	0.494***	0.590***	0.515***	0.571***
	(0.021)	(0.193)	(0.020)	(0.187)
Controls	*No*	*Yes*	*No*	*Yes*
Observations	1,674	1,660	1,733	1,721
Adjusted R^2	-0.001	-0.040	-0.001	-0.044

This table presents the results for OLS estimation of the effect of participation in the phone survey on the treatment group assignment. Column Treatment 1 shows the results for the assignment for Group Treatment 1 (1 – assigned, 0 – otherwise) with and without controls. Column Treatment 2 shows the results for the assignment for Group Treatment 2 (1 – assigned, 0 – otherwise) with and without controls. Controls include age, education level, occupation, number of dependents/children, number of earning members, geographical zone, household income, assets, financial investments, insurance ownership, personal financial stability, financial literacy score, understanding of insurance, and risk and time preferences. The significance levels are described in the following way: *p<0.1; **p<0.05; ***p<0.01.

Our study required multiple visits to the household: first at base-line, then at end-line, and finally at the time of the phone survey. The attrition between base-line to end-line was 10.6%; between base-line to phone survey it was 41%. We tested whether this attrition was selective, i.e. whether it affected either of the treatment arms more significantly than other. The attrition between base-line to end-line, and between end-line and the follow-up survey, did not affect any of the treatment arms disproportionately more than the other. We tested whether participating in the phone survey additionally predicted treatment assignment and found that compliance was not selective across the treatment arms. Table D.2 documents a statistically insignificant coefficient on a dummy variable "Compliance" that takes the value of 1 if the respondent participated without any distraction in the phone survey, and 0 otherwise.

E   Intervention Evaluation based on Kaiser et al. (2020) scheme

In their meta-analysis of the financial education literature Kaiser, Lusardi, Menkhoff, and Urban (2020) describe the criteria to determine whether programs are effective, based on recent work on education interventions (Kraft 2020). First, only the results of studies with a causal interpretation (e.g. RCTs) can be evaluated by the "effect sizes". Second, the "effect size" interpretation depends on what, when, and how the outcomes are measured, with larger effects on outcomes that are easier to change, proximal to the intervention, administered soon after the intervention is completed, and measured with more precision. Third, effect sizes from lower-cost interventions are more impressive than similar effects from costlier programs. Fourth and last, programs that are easy to scale up are more likely to maintain their effectiveness.

Based on these factors, we can evaluate the effectiveness of our experiment. The experiment is a randomized control trial, a research design that guarantees a casual interpretation of the results. The experiment targets a very specific problem associated with an insurance product. However, that problem is widespread among the Indian population and causes significant loss in wealth.[35] The outcomes are measured close in time to the intervention and we do not evaluate the long-term effects of the education. According to Kraft (2020), our study should provide results with a relatively large "effect size".[36] Our intervention is low-cost. For studies discussed in Kaiser, Lusardi, Menkhoff, and Urban (2020), the mean and median cost per participant was \$60.40 and \$22.90

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[35]Over 80% of the retail insurance revenue for firms in India stems from similar bundled products.

[36]Kraft (2020) also provides a schema for interpreting effect sizes from causal studies of education interventions. Kraft (2020) suggests that effects larger than 0.20 standard deviations are "large", effects between 0.05 and 0.20 standard deviations are "medium", and effects under 0.05 standard deviations are "small". The effect of the intervention on purchase education falls into the "medium" category, as it is 0.14 standard deviations. According to this schema, our intervention is a low-cost easy-to-scale program with a medium "effect size".

respectively. The total cost of our intervention amounts to $40,000, which is equivalent to $14 per participant, with 2,800 individuals taking part. Finally, the main instrument of our interventions is the set of videos in detailed and easy-to-understand language describing a well-known product and providing rules of thumb for unveiling some of its hidden features. These videos are easily scalable, not just in terms of reaching a greater proportion of the population, but also in producing a targeted intervention for other retail products in India.

According to the criteria described above, our intervention is effective. As highlighted by Kaiser, Lusardi, Menkhoff, and Urban (2020), the RCT design leaves little debate regarding the internal validity of the study. In this context, the effect of financial education on the treated consumers is positive and welfare-improving. In the next section of the paper, we attempt to set up a new criterion that would allow us to evaluate the market equilibrium implications of financial education interventions and apply it to our case.

F   Comparison with Interventions from Meta-Analysis by Kaiser, Lusardi, Menkhoff, and Urban (2020)

F.1   Comparison

The evaluation criteria developed in this paper are applicable to a setting where an educational intervention affects the demand for a financial product, improving the demand for a "good" product and lowering the demand for a "bad" product. Using our criteria, we evaluate the papers from Kaiser, Lusardi, Menkhoff, and Urban (2020). We concentrate on interventions concerning the insurance market or insurance products. We exclude outcomes related to the knowledge about insurance and concentrate on demand for insurance products. Among six papers (12 outcomes), only two (three outcomes) describe

statistically significant effects of the interventions.[37]

Figure F.4 represents the financial sophistication in the markets before and after the interventions in light blue and dark blue respectively. The graph also uses yellow dots to display the lower bound of the ratio between the substitution fee that a sophisticated consumer can pay to opt out from the suboptimal product, e, and the maximum value discount that consumers would tolerate in the market, $\bar{q}$, required for unshrouding in the market, $\frac{e}{\bar{q}}$. The lower bound approaching 1 means that the substitution costs are close in value to the maximum value firms can shroud and that the firm's profit differential from the y-axis of Figure F.4 is close to 0. If the profit differential is very small, the firm has a low incentive to shroud values in the first place. Thus, very low levels of profit differential parameter or high levels of $\frac{e}{\bar{q}}$ might be unrealistic for the markets of products with shrouded values.

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[37]The list of insurance papers is provided below in F.2. Papers with statistically significant treatment effects are in bold.

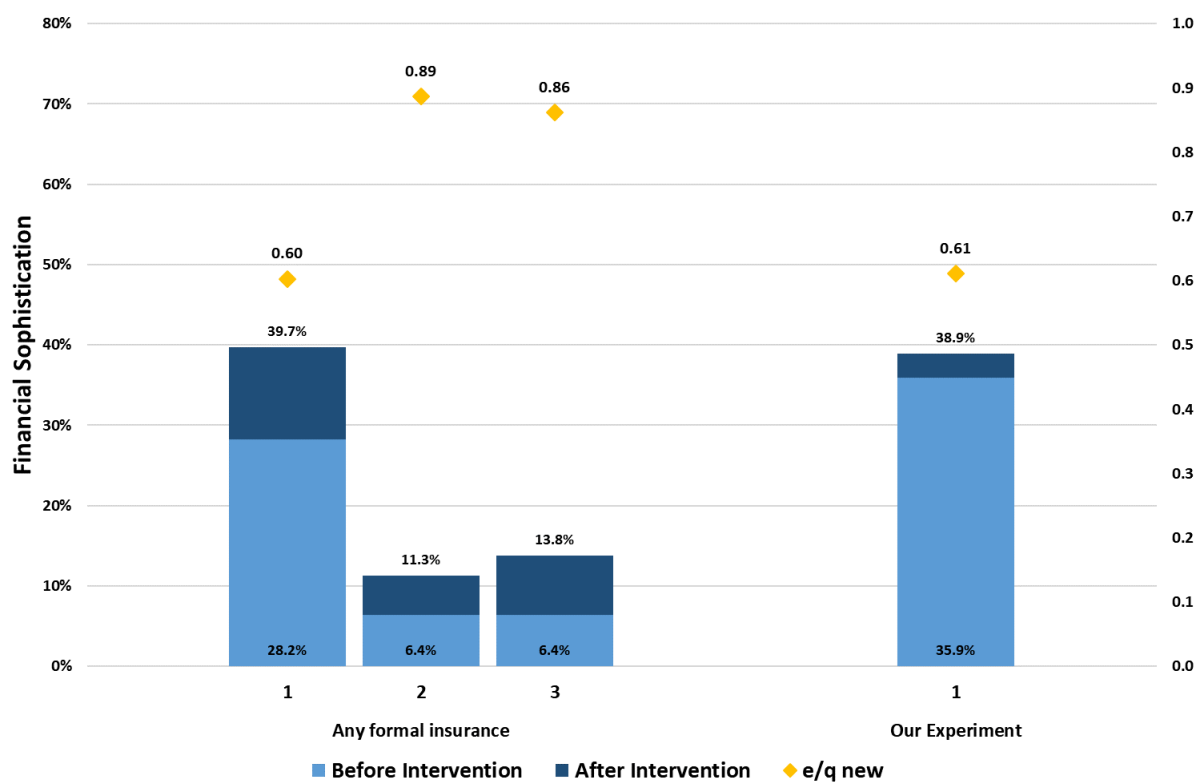**Figure F.4** Summary: Financial Education Interventions

Figure F.4 displays the effects of the financial education intervention on the demand for or intention to purchase insurance products. The initial level of sophistication is shown in light blue, the after-intervention level in dark blue. Yellow diamonds represent the lower bound for the ratio between cost of substitution available for sophisticated investors, e, and the maximum achievable value discount in the market, $\bar{q}$.

Figure F.4 shows that, for all interventions, including ours, the ratio $\frac{e}{q}$ should be greater than 50% to be effective, given the *ex-ante* level of financial sophistication. Two intervention outcomes require a ratio of greater than 80%, which is equivalent to a profit differential lower than 20%.

F.2   List of papers in the comparison

- Bonan, J., Dagnelie, O., LeMay-Boucher, P., and Tenikue, M. (2016). The impact of insurance literacy and marketing treatments on the demand for health microin-

surance in Senegal: a randomised evaluation. Journal of African Economies 26(2), 169-191.

- Carpena, F., Cole, S., Shapiro, J., and Zia, B. (2019). The ABCs of financial education. experimental evidence on attitudes, behavior, and cognitive biases. Management Science 65(1), 346-369.

- **Cole, S., Gine, X., Tobacman, J., Topalova, P., Townsend, R., and Vickery, J. (2013). Barriers to household risk management: evidence from India. American Economic Journal: Applied Economics 5(1), 104–135.**

- **Gaurav, S., Cole, S., and Tobacman, J. (2011). Marketing complex financial products in emerging markets: evidence from rainfall insurance in India. Journal of Marketing Research 48(SPL), S150–S162.**

- Gine, X., Karlan, D., and Ngatia, M. (2013). Social networks, financial literacy and index insurance. World Bank, Washington, DC.

- Kaiser, T. and Menkhoff, L. (2018). Active learning fosters financial behavior: Experimental evidence. DIW Discussion Paper No. 1743.

MORE IN THE SERIES

- Goyal, A., Pandey, R., and Sane, R., (2021). Consumption baskets of Indian households: Comparing estimates from the CPI, CES and CPHS, W.P. No. 343 (August).

- Jha, A. N., (2021). *Continuity with Change:* Approach of the Fifteenth Finance Commission, W.P. No. 342 (August).

- Chakraborty, Lekha., (2021). Mainstreaming Climate Change Commitments through Finance Commission's Recommendations, W.P. No. 341 (August).

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