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A Studyof Integrated Cryptocurrencymodel for Initial Coin Offerings: Based OnModern Portfolio Theory

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ABSTRACT
A blockchain is the decentralized database involving a cryptographically secured and crypto-economically incentivized class of distributed ledger. Cryptocurrencies are pure digital assets and use distributed hashing capabilities to solve the complexity of encryption and individual blocks of blockchain technology. An initial coin offerings is a form of a crowdsale in which a startup releases a new token to the public in exchange for another cryptocurrency, typically Bitcoin or Ethereum. And it presents opportunities and benefits, as well as threats and disadvantages, to the traditional venture capital business model. From these existing studies of Pygmalion effect, some researchers articulate the promise and value of cryptocurrency in initial coin offerings. However, based on modern portfolio theory, this study regards cryptocurrency as a kind of financial asset and proposes an integrated cryptocurrency model of financing for ventures by using cryptocurrencies, a fast growing asset class. This token model is a kind of masternode to collateralize the network and speed transaction pace and may pay dividends to masternode holders, allowing venture capitals that purchase these types of central hubs to potentially engage in a lucrative form of dividend payment. Using cryptocurrencies as a new funding stream may garner large amounts of capital and rebirth of venture capitals to support the future of funding ventures.

Keyword:blockchain; criptocurrency; initial coin offerings; venture capital; Pygmalion effect; Modern Portfolio Theory

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I. INTRODUCTION

Cryptocurrencies are pure digital assets and distributed hashing performance used to solve the complexity of encryption and the individual blocks in the open ledger. Because of the computing power required for hash transactions, cryptocurrencies cannot be forged or otherwise cloned. This invariance is due to significant inherent cryptocurrencies. Value can be duplicated or stolen because it can be used to buy goods and services without interest in the fund. In addition, cryptocurrencies are becoming more and more valuable stores like gold as an asset class (Burniske& White, 2017).

Initial coin offerings (ICOs) stands for Initial Coin Offering and is the latest emerging concept of the crowdfunding project in the encrypted money and block chain industry. - This is an event sometimes called 'crowdsale' when the company discloses its own encryption currency for funding purposes. It usually exposes a certain number of cryptographic tokens, and the tokens are exchanged for people who are interested, usually bit coins, but can also be nominally denominated. As a result, the company gets funding for product development and people get a cryptographic token. They also have complete ownership of the token equity. However, ICOs have confused the early fundraising ecosystem by replacing venture capital with gatekeepers. Global ICO participants can now bypass VCs and participate digitally in funding start-ups they trust in more flexible markets.

Given this situation, this study demonstrates how cryptocurrencies' wealth-generation potential can change the dynamics of institutional funding for ventures. Geared toward the ultimate goal of funding ventures, this article outlines an integrated approach to an actively managed cryptocurrency that was integrated by token to set up the initial master nodes. The integrated approach is strategically deployed to earn lucrative dividends.

II. LITERATURE REVIEW

2.1. Block Chain

The blockchain is a distributed public ledger that uses a cryptographic consensus protocol to enable the

exchange of value between two parties who otherwise do not know or trust one another. It allows strangers to exchange value of any sort without the need for banks, escrow agents, attorneys, accountants, and other intermediaries. In other words, the blockchain is a kind of ledger that can be used to record virtually any type of transaction. A ledger is a typical accounting technology to record when anything of value is transacted. As the basic instruments of transactional legitimation, ledgers are a basic technology of market capitalism (Yamey, 1949). The basic qualities a ledger possesses are clarity, consistency, and consensus as a factual and agreeable recording of the basic datum.

But, the other quality that a ledger must have is trust in the ledger itself. A higher trust ledger creates a lower transaction cost economy, a precondition for economic efficiency and prosperity (Nooteboom, 2002). Trust is higher when the ledger is more centralized and stronger. Therefore, the need for high-quality trusted ledgers is the same expression of the need for high-quality central government institutions and large centralized aggregating organizations. However, large central governments and large aggregator corporations require some cost, both in overhead processes associated with management (Scott, 1998).

The blockchain technology integrates mathematical cryptography, open source software, computer networks, and incentive mechanisms. A blockchain is a distributed database associated with a cryptographically secured and crypto-economically incentivized class of distributed ledger. Through a public distributed ledger, the blockchain replaces public verification and consensus for auditing by a trusted third party. In sum, three aspects of how they work are instrumental to the perspective of blockchains as a new technology. First, a blockchain is a database that produces trustless consensus (Larimer, et al., 2016). Second, blockchains operate on the internet, and so the possibilities of economic coordination are limited by the extent of the blockchain (Wood, 2014). Finally, blockchains are a database, and anything digital can exist on a blockchain (Allen, 2016).

2.2 Block Chain Currency And Token

Blockchain tokens involves many kinds of assets, such as currencies, securities, properties, loyalty points, and gift certificates, among others (Buterin, 2014). There are two kinds of blockchain tokens including currency and token. A currency is generally based on a blockchain. Such a currency is generally called a cryptocurrency, for blockchain technology is based upon cryptography. The typical example is Bitcoin that is the currency of the Bitcoinblockchain (Nakamoto, 2008). The Bitcoinblockchain enables users to store and transfer Bitcoins on a peer-to-peer network. Another one is Ether that is the currency of the Ethereumblockchain. The Ethereumblockchain also enables users to store and transfer Ethers on a peer-to-peer network. Furthermore, the Ethereumblockchain can enable users to do smart contracts and decentralized applications (Buterin, 2014).

Unlike a currency, a token is not based on a blockchain but is created and governed by a smart contract (Massey, et al., 2017). For example, on the Ethereum platform, most tokens are governed by smart contracts following the common standard called ERC20. It specifies a set of functions and events that all ERC20-compliant smart contracts should provide. Therefore, ERC20 tokens have been created to implement many kinds of digitalized assets, enabling them to play important roles in the Ethereum ecosystem.

2.3 Initial Coin Offerings

An initial coin offerin (ICO) is a type of crowdsale in which a startup releases a new token to the public in exchange for another cryptocurrency, such as Bitcoin or Ethereum in general. The released token typically provides a function or service for its community, ranging from general payments, special permissioned access or even profit-sharing in more security-like tokens. Token holders continue to receive these benefits as long as they hold the token. If the quality and scope of these services improves, demand for the limited supply of released tokens rises, generally leading to appreciation of the token value. ICOs are often described as a hybrid between a grant and an investment, sharing similar traits with both crowd-funding and Initial Public Offerings (IPOs). ICOs offer to the public a fraction of initial supply in a new digital project in the form of tokens, representing a fraction of a digital token.

Despite their perceived similarities to Initial Public Offerings (IPOs) as well as to crowd-funding campaigns on platforms such as Kickstarter and Indiegogo, ICOs have distinct features that render this initial perception devoid. ICOs consist in the sale of a stake in a project with the aim to raise funds at an early stage of development. Although ICOs share some similarities with both IPOs and crowdfunding campaigns, they differ from both of these. Differently from IPOs, where companies sell stocks via regulated exchange platforms, ICOs sell digital tokens to early investors via non-regulated exchange platforms. The issuance of tokens occurs through an indelible distributed ledger in the form of an organization's cryptocurrency. These tokens create the capital inflow required for the project finance, as they can be purchased online with fiat currency or another digital currency at a predetermined exchange rate. Differently from common stocks available in an IPO, tokens do not generally confer ownership rights.

Instead of the ownership right itself, a token offers a discounts on cryptocurrency before they hit the exchanges once the ICO is launched and, together with the stake in the company, a right to vote on future decisions. Some ICOs provide for different categories of participations such as voting members, founding member, third party service provider member, asset gateway member. ICOs share specific similarities with traditional crowdfunding, which are connected to their online campaigns being implemented through specific platforms. However, investments in ICOs significantly differ from the ones in crowdfunding, since they cannot be qualified as a donation, but more generally as a financial stake in the company, incorporating, as mentioned above, the right to vote on future decisions. Therefore, differently from any campaigns conducted on Kickstarter, ICOs have a clear speculative purpose, consisting in the trade of material value developed on platforms and cryptocurrencies.

When the first ICO launched in 2013, the fundraising method quickly gained popularity in the crypto and blockchain communities. In 2017, however, the general startup and VC ecosystem has begun to take notice, leading to an explosion of ICO activity. Through November 2017 alone, 228 ICOs have raised over $3.6 billion. ICOs have become the preferred fundraising method for blockchain startups, with roughly 60% of capital raised in 2017 originating through an ICO.

2.4 A Radical Change In Venture Funding Environment

ICOs are a new way for startups to raise fund. And, it has already enabled entrepreneurs to raise billions of dollars from global investors. Traditionally, entrepreneurs must raise funds from angel investors or venture capitalists. Entrepreneurs usually have a lot of touble in finding investors who eventually make equity investments (Feld &Mendelson, 2016). The fundraising process is very inefficient, for entrepreneurs have to present their business plans to many potential investors in order to find investors who are willing to invest.

Like crowdfunding (Mollick, 2014), initial coin offerings are open to almost anybody with Internet access. Like crowdfunding (Mollick, 2014), ICOs bypass traditional intermediaries such as venture capitals (VCs) and investment bankers and raise funds directly from early investors. Unlike crowdfunding investments, however, blockchain tokens are scarce, global, liquid, and tradable, making them especially appealing to global investors (Massey, Dalal, &Dakshinamoorthy, 2017).

Especially, VCs have long been the gatekeepers of the early stage investment ecosystem. VCs have invested startups by raising their own funds from elite, high net worth investors. VCs then decide which startups are most worthy of funding. In essence, first, investors in VC funds have little power over the use of their committed capital and must wait 7-10 years until a financial return can be recognized due to the illiquid nature of their investments. Second, startups must endure a long process to raise funding to develop their business. Recently, ICOs as a new alternative funding source have arisen for blockchain startups and projects that can be leveraged by many kinds of non-blockchain companies and projects as well. ICOs have disrupted the early stage fundraising ecosystem by replacing VCs as gatekeepers. Therefore, global ICO participants can now bypass VCs and digitally participate in the funding of any startup they believe in, within a more liquid marketplace.

ICO offers opportunities and benefits as well as threats and disadvantages to traditional venture capital business models. Although venture capitalists have been reluctant to the ICOs, they are now becoming more interested in it for a number of reasons. First, it is profits, for cryptocurrency investors made some massive returns in 2016. Cryptocurrencies from Blockchain startups shows 2,000% increases in value. And, the cryptocurrency used for the Ethereum shows its value double in just a few days in March 2017. Therefore, VCs are more interested in investing tokens as alternative investment.

Second, it is the liquidity of cryptocurrencies through ICOs. Rather than tying up funds in a startup and waiting IPO or an acquisition for the long time, investors can get gains more quickly and easily through ICOs. At least, VCs are more interested in raising its third fund through a digital token offering in the liquidity-enhanced venture capital fund. This kind of venture capital fund enables people to invest without locking their money up for years on end through a digital token.

However, venture capitalists are still taking a hard look at this new phenomenon, for it's not just about the money that can be made but it's also about funding projects, startups and even networks. Moreover, the method of ICOs is still immature and is somewhat controversial. It may continue to evolve and develop, allowing it to play increasingly important roles in venture funding.

III. THEORETICAL BACKGROUND

3.1 Pygmalion Effect

People including pupils, subordinates, and so on tend to act in accordance with the expectation of others including teachers, managers, and so on. Especially, the former may internalize the higher expectations placed on them by the latter, and then act in ways to fulfill those expectations. A study of Rosenthal and Jacobson (1968) showed that a teacher's expectation for a pupil's intellectual

competence can come to serve as an educational self-fulfilling prophecy, and names this phenomenon the Pygmalion effect after Greek myths. Livingston (1969) discussed the Pygmalion effect not in educational setting but in managerial setting. He argued as follows. First, what managers expect of subordinates and the way they treat them largely determine their performance and career progress. Second, a unique characteristic of superior managers is the ability to create high performance expectations that subordinates fulfill. Third, less effective managers fail to develop similar expectations, and as a consequence, the productivity of their subordinates suffers. Fourth, subordinates, more often than not, appear to do what they believe they are expected to do. After the study of Livingston (1969), many researchers have been studying the Pygmalion effect in business or military organizations. Kierein& Gold (2000) and McNatt (2000) conduct meta-analysis of relevant studies within management contexts, and both find that the Pygmalion effect is in general fairly strong.

From these existing studies of Pygmalion effect, Nambisan (2017) emphasized that new digital technologies have changed the nature of uncertainty in entrepreneurial processes and outcomes as well as the ways of dealing with such uncertainty. In articulating the promise and value of such a digital technology perspective, Nadeem (2017) argued how it would build on and enrich the social entrepreneurship model for crypto-currencies such as Bitcoin, Ethereum, Litecoin, Ripple, Dash, Monero, NEM, and Stratis market. Munoz (2016) suggested that the ubiquity of new technologies, and collaborative business models are fostering a new form of entrepreneurship. As Heimer (2017) suggested that the lack of a regulatory road map has kept big financial institutions and asset managers from investing in cryptocurrencies. New products may remove those hurdles, and bitcoin's value could grow by many more multiples as Wall Street joins the fray. Moreover, many Bitcoin customers believe it will become a true global currency which you could spend the same way as they use Visa or MasterCard today and when it does, it might be the end of Bitcoin's huge price surge. Because the digital coin to be useful as a currency, its value would have to stabilize. The price drops-off or more have been routine for Bitcoin. Although Bitcoin is the oldest and most valuable cryptocurrency, but many kinds of nimble competitors such as Ethereum and Bitcoin Cash are gaining ground.

3.2 Modern Portfolio Theory

A major reason for the volatility seen in crypto-token prices is that there is nothing that ties down their value if they are only used as a medium of exchange. In contrast, conventional stocks and securities dole out non-retained profits in the form of dividends in proportion to stock ownership share. Retained profits are reinvested in the firm and management has a fiduciary duty to do so in a way that maximizes shareholder value. If managers are doing their job, reinvestment only takes place when it returns more to stockholders in future profits than they could make by investing these profits on their own in other companies. Securities derive their value from these current and future dividend streams. Tokens are new thing. Investors don't have much experience with them so they may not be very good and estimating their value. In addition, blockchain is a relatively new technology and there is a great deal of uncertainty over how much potential for profit there is and which sectors are the right ones to invest in. More generally, investors might be willing to pay more for a given revenue steam coming through tokens than from stock ownership. In other words, the framing of the offer may affect how much investors are willing to pay for same expected return.

Bitcoin created a new type of asset that could be leveraged against other asset classes. Greer (1997) argued that the assets have some fundamental characteristics, but differ from one another in their attributes. Depending on Greer's framework Burniske& White (2017) contended that Bitcoin fulfills the requirements of an asset. In particular, they noted that Bitcoin is unique in that it is not affected by movements in other assets. It means that it reduces overall risk as part of a portfolio, despite volatility within its own asset. Financial diversification is a basic concept in modern portfolio theory. Modern economic models have been based on Modem Portfolio Theory (MPT) of Markowitz's (1991) which predicts that where two assets have equal mean return, the one with the lower variance will be more profitable because it is less risky and that variance can be reduced by diversifying investments and reducing the covariance among investments. An important outcome of the research generated due to the ideas formalized in MPT is that today's investment professionals and investors are very different from those 50 years ago. MPT allows both investment professionals to better serve the needs of their clients, and investors to monitor and evaluate the performance of their investments. Therefore, MPT provides a framework to construct and select portfolios based on the expected performance of the investments and the risk appetite of the investor.

It may seem paradoxical to relate traditional finance to the funding of venture. However, both fields can become overly reliant on relatively few streams of revenue. However, both finance and venture have depended, at times, on only a few sources of income. To avoid such over-dependence, investors have long envisioned a different type of

financial diversification that did not rely solely upon fiat currency for financial stability. This proposal does not call for ICOs to replace all traditional ways to fund ventures. Rather, it points to the need for financial diversity to increase the independence and local control of venture funding. For the ultimate goal of funding ventures, this study outlines an innovative approach to an actively managed ICOs. From a broad, less technical perspective, my strategy aligns with Reiss (2017)'s notion of dividend reinvestment. He underscored that wealth generation could be achieved by investing in assets and reinvesting any dividends into the original strategy. This notion greatly informed the token selection that later populated the portfolio.

IV. THE NEW MODEL OF ICO FOR VENTURE FUNDING

4.1 Existing Model: Independent Token

ICO usually goes through white paper disclosure, foundation establishment, code disclosure, and funding. First, there is no related law or regulation, but it is a tacit agreement set up by the industry for transparent ICOs. The white paper contains concrete block chain techniques and token procurement that companies will commercialize. It is similar to the securities report issued during the IPO process. The initial exchange rate is set to the number of issued tokens per USD 1. The white paper explains the allocation ratios of the tokens to be issued as follows and the plans for the use of funds to be received through the tokens allocated to investors. The allocation ratios of these issuing tokens and the plans for the use of incoming funds through the tokens allocated to investors differ somewhat for each venture that issues tokens. Some companies offer tokens that are issued through ICO, similar to stocks, to develop technology with funds raised through ICO, and to offer dividends through profit if the business succeeds.

Second, establishing a non-profit foundation is a necessary process for companies pursuing ICO. Since token coming into the ICO is kept in the non-profit foundation, not in the company, it is a measure to ensure the reliability of the promise of transparent use of the business for the development of the block chain without using the investment for other purposes. In addition to securing transparency in the use of funds, the non-profit foundation also serves as a shield to avoid being touched by other countries' virtual currency regulations. About 70% of companies that have done ICO have established a foundation in Switzerland. Switzerland is one of the few countries in the world where virtual money regulation is the least, allowing financial companies to invest in virtual money assets.

Finally, source code release is another important step. It is common to open the contents to the open source software specialist site "GitHub" even though it is an open source event. Finally, funding is automatically terminated if you reach the maximum amount you are willing to pay within a fixed period of time. Also, at the end of the funding period, the amount of unreleased remaining tokens will be incinerated.

4.2 Emerging Challenges In The Existing Model

First, in the existing ICO structure, investors invest in each individual token issued by each individual venture company. In the structure in which there is no dividend, the price movement of the token becomes a supply and demand of the virtual currency exchange market regardless of the performance of the individual venture company This phenomenon appears initially, but thereafter, individual token prices that are not based on the performance of individual venture firms may not move or may fail to issue ICOs. On the other hand, in a structure in which investors invest in each individual token issued by each individual venture company, the price of the token will move based on the performance of the individual venture company. In fact, given the high risk of failure, the token price will be zero at the expiration of the venture company, and the investor will suffer the damage (The economist, 2017). In this case, investors will be passive in investing in ICOs in tokens or buying in exchanges.

Second, ICOs require initial capital to fund the process and a knowledge of best practices in raising an ICO. As such, not all great token ideas are capable of launching their own ICO. Lack of funding, relevant network and competencies are significant barriers for many startups who wish to launch an ICO. And, in the current structure, individual venture companies must establish a nonprofit foundation abroad whenever they finance with ICO. In this case, it is necessary to spend time and money on developing ICO knowledge and tokens. It is impossible or burdensome to the position.

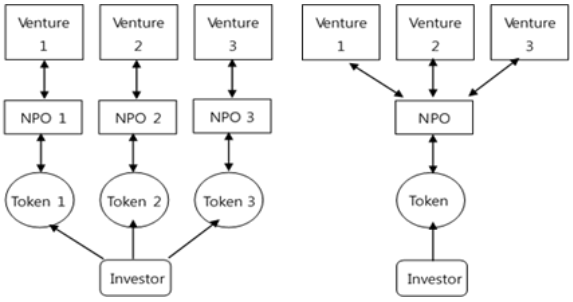
Third, despite the increase in the volume of ICOs and impressive funding amounts raised by startups, investors are still disenfranchised from assuring their participations are not scams or frauds, or that the money raised is used for what is promised by management. It is clear ICO participants are operating in a purely speculative environment filled with risk. Historically, due diligence would be performed by VCs on new investment opportunities. Critically important, the VC would then enforce a high standard of post-investment financial and milestone reporting to all stakeholders to assure investment performance. It is painfully clear a reinvention of these services is essential in the ICO markets.

4.3 New Model: Integrated Token

To respond these emerging challenges, this study proposes a new model called an integration token which issued by VCs. In the case of a new model, first, in the perspective of investors, the performances of many venture companies are reflected in one token. Therefore, even if one venture company is destroyed, the performance of other venture companies is big This is because the number of ICOs provided by many venture companies increases the stability of the token investment, so it can be evaluated as a stable token in the exchange. In addition to the ICO stage, the token is traded at a price reflecting the value based on dividend payout.

Second, in the perspective of ventures, individual venture companies are able to use ICOs by using tokens without having to establish a non-profit foundation overseas and develop individual tokens in order to issue tokens through ICO. To ensure the highest quality startups are capable of launching an ICO, the infrastructure must be redesigned to provide funding, mentorship and support programs for the worthiest projects, accelerating them to become a great ICO participation opportunity.

<Figure 1 >Existing Model Vs. New Model



Finally, in the perspective of VCs, the crypto-asset is a kind of security in a startup. Instead of stock splits, the founding crypto-asset gets denominated in smaller and smaller units. Here, everyone in the network is an equity holder who has an incentive to increase the value of the network. All of this depends upon how well the initial crypto-asset and its governance contract are designed and protected. In this instance, good governance such as oversight, yields predictability, security, and effectiveness, which in turn creates value for all token holders.

To implement the new process model, first, a VC establishes a nonprofit foundation (hereinafter referred to as an ‘integrated nonprofit foundation’) for the purpose of issuing ICOs for the financing of a number of ventures. Second, ‘integrated nonprofit foundation’ creates tokens (‘integration tokens’) from this "integrated nonprofit foundation" and publish basic white papers and source code. Third, in the basic white paper, the allocation ratio of tokens to be issued is set to be the same regardless of the number of tokens for each venture to which the token is issued. Fourth, the plans to use funds raised through tokens allocated to general investors (cash that sells the tokens and sells the editors or beat coins) are different whenever individual ventures do ICOs through ‘integration tokens’. And they will be announced on the homepage of the 'integrated nonprofit foundation' or on the homepage of the individual venture company or the virtual currency exchange every time a new integrated token is issued. Fifth, the price (in USD or Ethereum/Bitcoin basis) of the newly issued 'integrated token' is based on market price except for the first issue. Sixth, if individual ventures provide profit dividends by increasing earnings, the VC pays them to holders of all 'integration tokens' held at the time of dividend. Therefore, the holder of the 'integration token' may be in a state where several venture companies have been destroyed at that time, and at the same time, profit sharing from various venture companies will be possible. Finally, in order to form price quotes of 'integrated tokens' at virtual currency exchanges, the VCs discloses the status or performance of ventures that issued 'integrated tokens'.

V. CONCLUSION

A blockchain is a distributed database associated with a distributed ledger class that is password protected and economically incentivized by passwords. Cryptocurrencies are pure digital assets and use distributed hashing capabilities to solve the complexity of encryption and individual blocks of block-chain technology. An initial coin offerings is a form of a crowdsale in which a startup releases a new token to the public in exchange for another cryptocurrency, typically Bitcoin or Ethereum. Many complexities hinder the venture funding process. There are a lot of concerns when it comes to supporting venture companies. Historically, there has been no institutional opportunity to circumvent venture capital, but the use of cryptocurrency for venture investment can now challenge its superiority. Cryptocurrencies and blockchain technologies provide a probation of traditional VC models that rely on venture funding structures. However, ICOs also presents opportunities and benefits as well as threats and disadvantages to existing venture capital business models. In a previous study of Pygmalion effects, some researchers articulate the promise and value of cryptocurrency in ICOs. However, according to modern portfolio theory, this study considers cryptanalysis as a kind of financial asset and suggests an integrated financial cryptography model for financing for ventures by using cryptocurrencies, a fast-growing asset class. This token model is a kind of masternode that can secure the network, speed up the transaction and pay

dividends to masternode holders, and allows venture capitalists to buy these types of central hubs to participate in potentially profitable payout schemes.

This study has some research contributions. First, this study suggests theoretical ground of initial coin offerings. The existing studies depend on Pygmalion effect. However, unlike conventional stocks and securities, a major reason for the volatility seen in crypto-token prices is that there is nothing that ties down their value if they are only used as a medium of exchange. Therefore, based on modern portfolio theory, this study regards crytocurrencies as financial asset and argues that investors need investment diversification. Second, this study argues that the use of open source staging algorithms can be an alternative to the structure of VCs' investment for ventures. In particular, the 'integrated token' model presented in this study demonstrates how the transition to an effective method for venture funding can create capital for ventures. The model of 'integrated tokens' is not only equitable and accessible, but it can also drive innovation by giving entrepreneurs independence and financial ability. This new model is relatively straightforward for the funding ventures. However, when others replicate this strategy, a number of decisions will need to be made.

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