

February 2017

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Fathali Firoozi

*University of Texas at San Antonio*

Abol Jalilvand

*Loyola University Chicago*

Donald Lien

*University of Texas at San Antonio*

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### Recommended Citation

Firoozi, Fathali; Jalilvand, Abol; and Lien, Donald (2017) "Information Asymmetry and Adverse Wealth Effects of Crowdfunding," *The Journal of Entrepreneurial Finance*: Vol. 18: Iss. 1, pp. 1-8.

Available at: <http://digitalcommons.pepperdine.edu/jef/vol18/iss1/4>

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## **Cover Page Footnote**

Fathali Firoozi (corresponding author), Department of Economics, University of Texas at San Antonio, San Antonio, TX 78249. Email: [fathali.firoozi@utsa.edu](mailto:fathali.firoozi@utsa.edu). Abol Jalilvand, Department of Finance, Loyola University Chicago, [Ajalilv@luc.edu](mailto:Ajalilv@luc.edu). Donald Lien, Department of Economics, University of Texas at San Antonio, [Don.Lien@utsa.edu](mailto:Don.Lien@utsa.edu).

# Information Asymmetry and Adverse Wealth Effects of Crowdfunding

Fathali Firoozi<sup>1</sup>, Abol Jalilvand<sup>1</sup>, Donald Lien<sup>1</sup>

Revised, February 2017

<sup>1</sup>Fathali Firoozi (corresponding author), Department of Economics, University of Texas at San Antonio, San Antonio, TX 78249. Email: fathali.firoozi@utsa.edu. Abol Jalilvand, Department of Finance, Loyola University Chicago, Ajalilv@luc.edu. Donald Lien, Department of Economics, University of Texas at San Antonio, Don.Lien@utsa.edu.

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Fathali Firoozi

*University of Texas at San Antonio*

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Donald Lien

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## ABSTRACT

The Jumpstart Our Business Startups (JOBS) Act of 2012 in the U.S. expanded the capital markets so that entrepreneurs can appeal directly to non-traditional small crowd investors for investment funds. The final rules and forms of the JOBS Act became effective in May 16, 2016. Existing literature is thus relatively small but contains ample praises for expected positive consequences of the new crowdfunding laws for the capital markets and for the crowd in general but has only limited analysis on the prospect of adverse wealth effects of crowdfunding for the crowd investors. A limited number of existing studies have highlighted the prospect of a rise in opportunity for fraud as a consequence of information asymmetry between venture capital seekers and crowd investors. This study establishes a new and secondary form of adverse wealth effect of crowdfunding for the crowd in a setting that focuses on information asymmetry between non-accredited crowd investors and accredited traditional investors. The analysis is performed within a two-period, two-state signaling model with information asymmetry between two groups of signal recipients.

**Keywords.** Entrepreneurship, equity investment, project financing, signaling, venture capital.

**JEL Codes.** G14, G24, G28.

## I. Introduction

Crowdfunding is a practice in which start up entrepreneurs in search of funding sources may go directly to the general public (the crowd) by an internet platform to wholly or partly finance their projects. Although

crowdfunding in its primitive form has been an informal practice for decades in a number of developing countries, the Jumpstart Our Business Startups (JOBS) Act of 2012 in the U.S. removed some of the legal and protective measures and opened the capital markets so that the entrepreneurs appeal directly to the crowd for investment funds.<sup>1</sup> This new opening has started an expanding academic and professional debate on various consequences of crowdfunding in terms of technicalities and legal implications as well as its impact on financial markets and wealth distribution in the society. Recent literature on crowdfunding includes the comprehensive studies of Griffin (2013) and Agrawal, Catalini, Goldfarb (2013). A special issue of California Management Review (2016) offered several informative reviews on history and aspects of crowdfunding as it stands now. The debates at this point are primarily theoretical since the time has not allowed yet to have a sufficiently long data in large markets to perform a reliable empirical study of the crowdfunding's long term wealth effects.<sup>2</sup>

The proponents of the JOBS Act have suggested that the beneficiaries of crowdfunding include both new ventures seeking capital and the crowd with small savings seeking investment opportunities. However, the main concern that has been almost universally stated in the debates on crowdfunding is related to signaling and information asymmetry suggesting that the crowd is not as fit as the traditional lenders to evaluate the true risks and prospects of a new venture and thus may fall in the trap of false signals sent by entrepreneurs seeking funds or inability to assess the signals correctly. The core concern stated in the literature is misinformation or fraud that can be inflicted on non-expert crowd by fund seekers. The opposition to the JOBS Act has argued that the Act removed some of the core investor protection measures that existed in the legal paradigm prior to the JOBS Act of 2012. Groups that recorded their opposition to the JOBS Act during its hearings

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<sup>1</sup>On October 30, 2015, the SEC adopted final rules allowing Title III equity crowdfunding. The final rules and forms are effective May 16, 2016, which is the earliest date small businesses are allowed to utilize the JOBS Act provisions to raise capital. Companies are permitted to offer and sell up to \$50 million of securities to the general public under the relaxed provisions of the JOBS Act. Wikipedia (2016).

<sup>2</sup>There are some pioneering and rare empirical studies on certain aspects of crowdfunding. Ahlers, Cumming, Gunther, and Schweizer (2015) focused on the issue of asymmetry of information between fund seekers and crowdfunders and offer some insight on the risk related to the information that the fund seekers may provide to the crowd. The study of Kim and Hann (2015) showed that the entrepreneurs turning to crowdfunding are typically those who have difficulty securing funding from the traditional sources. In a preliminary empirical study of crowdfunding, Mollick (2014) provided indications on some aspects of crowdfunding, in particular observes that the successful crowd-funded projects typically have narrow margin while the failing projects fail by a wide margin.

included the AARP, the Consumer Federation of America, and the Council of Institutional Investors.<sup>3</sup> Such concerns are based mainly on two observations; first, ventures seeking crowdfunding are likely to have already failed to secure funds from the traditional funding sources and, second, the crowd investors likely do not have the expertise to correctly assess the risks and prospects associated with a venture seeking capital. Such concerns apply to both "debt crowdfunding" and "equity crowdfunding".

The negative prospect of crowdfunding in terms of adverse wealth effect for the crowd as presented in the existing literature and summarized above is focused entirely on information asymmetry between fund seekers and crowdfunders. In the present study we establish a new and secondary form of wealth effect against the crowdfunders that has nothing to do with information asymmetry between fund seekers and crowdfunders. One of the two core observations in the present study is that the emergence of crowdfunding has also brought a distinct characterization of two groups of investors in the capital markets, namely the traditional accredited investors who are mainly large investors such as investment banks, and the other group consisting of the non-accredited small crowdfunding investors. An underlying relevant observation is that a rather large portion of the starting ventures seeking capital fail before reaching a maturity stage. In this study we utilize the natural information parity that exists between the stated two investor groups in a rational setting to highlight the expected or long term redistribution of wealth against the crowd investors. The notion of investor information parity applied in the present study is defined in section 2. The model and its main results are presented in section 3. Some qualifying aspects of the results and their policy implications are discussed in the last section.

## II. Investor Information Parity

Emergence of crowdfunding has brought a distinct characterization of two groups of investors in the capital markets, namely, traditional accredited investors who are mainly large investors and investment banks, and another group consisting of non-accredited small crowdfunding investors (the crowd). All of the relevant investment rules and information posted by the SEC and other governmental agencies are available to both accredited traditional investors and non-accredited crowd investors. Despite the efforts made by the oversight and regulatory agencies to level the participation grounds in the expanded capital market, one can rationally argue

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<sup>3</sup>Consumer Federation of America (2012). Wikipedia (2016).

that a substantial private information parity can still naturally exist between accredited traditional investor group and non-accredited crowd investor group. By definition, non-accredited crowd investors consist of small investors that are not as resourceful and typically have less capital and less investing experience relative to accredited traditional investors. Accredited traditional investors are typically in a position of having access to private resources that allow them to have a deeper financial and operational knowledge and thus are in a position of making a better risk assessment regarding a prospective start-up venture relative to non-accredited crowd investors. Such private parities have important implications for risk assessment and investment decisions. A start-up venture typically sends signals to potential investors regarding the prospects of its management, product line, marketing, and financial plans. The signals from the start-up fund seekers are likely to have a more accurate and realistic interpretation when received by an average accredited traditional investor relative to interpretation made by an average non-accredited crowd investor. We refer to the collection of these natural and relevant differences between the stated two investor groups as the investor information parity.

### III. Wealth Redistribution Effect

Consider a capital market with an investor composition consisting of an accredited traditional investor group and a non-accredited crowdfunding investor group as defined in the last section. Both groups face investment decision in startup ventures under a historical record indicating that many startup ventures fail before reaching maturity. The following proposition highlights the core argument regarding the impact of investor information parity on the expected or long-run wealth redistribution effect of funding decisions by the two investment groups.

**Proposition.** Crowdfunding under investor information parity necessarily leads to a redistribution of wealth against the crowd as a consequence of long-term concentration of investment by non-accredited crowdfunders on failing ventures and long-term concentration of investment by accredited traditional investors on successful ventures.

**Proof.** The result emerges from a model of rational decision makers in a two-period, two-state signaling context with private information parity between two groups of signal recipients. Investors in period 1 make decision about investing in a start-up venture based on their expectation of the value that materializes for the venture in period 2. The value expectations in period 1 are formed by the following process. In period 1, investors receive

signals from the venture regarding its management, production line, marketing, and other relevant operational and financial strategies. The set of signals about the venture may also include firm-specific or industry-specific information posted by SEC or other public agencies. It is known by all participants that the value of the venture in period 2 will take one of the two possible states: High ( $H$ ) or Low ( $L$ ) satisfying  $L < H$ . A venture is labeled as a high-quality successful venture if its value in period 2 is high ( $H$ ), or a low-quality failing venture if its value in period 2 is low ( $L$ ). The investor belief or value likelihood parameter ( $\mu$ ) is then defined by:

$\mu$  = Value likelihood = Probability assessed by an average investor in period 1 that the venture's value in period 2 will be high ( $H$ ).

The value of  $\mu$  for an average investor is formed by the set of signals that the investor receives in combination with the investor's own private information, skills, and experience. The expected value of the venture in period 2 as assessed by the investor in period 1 is then given by:

$$E(V) = \mu H + (1 - \mu)L$$

We now assume that the investors in period 1 are considering two alternative start-up ventures denoted by  $S$  and  $F$ . The possible values for each of the two ventures  $S$  and  $F$  in period 2 are given by  $H_S$ ,  $L_S$ ,  $H_F$ ,  $L_F$ , respectively, which are common knowledge and satisfy the following inequalities:

$$L_S < H_S \tag{1}$$

$$L_F < H_F \tag{2}$$

We further assume that venture  $S$  is in fact a high-quality successful venture in the sense that its true value in period 2 will be  $H_S$ , and  $F$  is in fact a low-quality failing venture in the sense its true value in period 2 will be  $L_F$ .

There are two investor groups, namely, the accredited traditional investors ( $t$ ) and the non-accredited crowd investors ( $c$ ). For the two investor representatives  $t$  and  $c$  from these two investor groups, the value likelihood regarding the two ventures  $S$  and  $F$  are defined by:

$\mu_v^i$  = Probability assessed by representative investor  $i$  in period 1 that the value of venture  $v$  in period 2 will be high ( $H_v$ ), where  $i$  is the investor index with  $i = t, c$ , and  $v$  is the venture index with  $v = S, F$ .

In assessing interrelations among the four value likelihoods ( $\mu_v^i$ ), we now employ the investor information parity between accredited traditional investors ( $t$ ) and non-accredited crowd investors ( $c$ ) as discussed in the last

section. We reflect this information parity by assuming that the accredited traditional investor representative ( $t$ ) has a more accurate assessment of venture quality than the non-accredited crowd investor representative ( $c$ ). This parity combined with our earlier assumption that venture  $S$  is a high-quality successful venture and venture  $F$  is low-quality failing venture lead to the following inequality relations among the four value likelihoods defined above:

$$\mu_S^c < \mu_S^t \quad (3)$$

$$\mu_F^t < \mu_F^c \quad (4)$$

The expected values of the high-quality successful venture  $S$  as assessed by the two investor representatives ( $t, c$ ) are given then by:

$$E^t(V_S) = \mu_S^t H_S + (1 - \mu_S^t) L_S \quad (5)$$

$$E^c(V_S) = \mu_S^c H_S + (1 - \mu_S^c) L_S \quad (6)$$

It then follows from the two information parity inequalities in (3) and (1) that the two expected values of the high-quality venture  $S$  listed above satisfy the core inequality:

$$E^c(V_S) < E^t(V_S) \quad (7)$$

Similarly, the expected values of the low-quality failing venture  $F$  as assessed by the two investor representatives ( $t, c$ ) are given by:

$$E^t(V_F) = \mu_F^t H_F + (1 - \mu_F^t) L_F \quad (8)$$

$$E^c(V_F) = \mu_F^c H_F + (1 - \mu_F^c) L_F \quad (9)$$

It follows from the two inequalities in (2) and (4) that the two expected values of the low-quality failing venture  $B$  as listed above satisfy the second core inequality:

$$E^t(V_F) < E^c(V_F) \quad (10)$$

The core results are now shown by the two inequalities (7) and (10). Inequality (7) shows that non-accredited crowd investors systematically assign a smaller expected value to high-quality successful ventures than the expected value assigned by accredited traditional investors. Further, inequality (10) shows that non-accredited crowd investors systematically assign a larger expected value to low-quality failing ventures than the expected value assigned by the accredited traditional investors. A summary is that,

relative to the accredited traditional investors, the non-accredited crowd investors are rationally led to invest less in successful ventures and more in failing ventures. The result is purely a consequence of the investor information parity as defined in the last section and is independent of affordability on part of either of the two groups to invest in the two ventures. ■

#### IV. Qualifications and Policy Implications

Some aspects of the proposition shown in the last section can now be elaborated on. The core results in (7) and (10) reflect the expectations in terms of long-run wealth concentrations. As such, they clearly do not imply or require that every new venture invested in by non-accredited crowd investors will be a failing venture or every new venture invested in by accredited traditional investors will be a successful venture. An issue that arises here is the possibility of long-run learning by the crowd as is the case in the models of rational expectations so that the likelihood parities in (3) and (4) close. There are emerging ideas in the literature that are aimed at attaining exactly such outcomes so that non-accredited crowd investors behave in their investment decisions in ways parallel to the skillful and well-informed patterns applied by accredited traditional investors. Agrawal, Catalini, Goldfarb (2013, p.21) discuss market designs such as feedback systems and use of skilled intermediaries by the crowd groups aimed at closing the gaps in information asymmetries. However, Griffin (2013, p.399) offers counter arguments stating that the "wisdom of the crowd" does not work for equity crowdfunding. A market in which crowd investors can only safely invest through skilled representative investment firms is not a crowdfunding market in a full sense anymore.

On the issue of highlighting the adverse consequences of crowdfunding for the crowd, existing literature has focused on the information asymmetry between the fund seekers and crowd investors in forms that expose the crowd to misinformation and fraud by fund seekers. In that regard, a task of overseeing agencies is to find ways to protect the crowd investors against misinformation by certain fund seekers. The present study has highlighted a new and secondary type of adverse consequence for the crowd emanating from the information asymmetry between the traditional investors and the crowd investors. The stated information parity between the two investor groups systematically reduces the set of successful ventures for the non-expert crowd to invest in as the expert traditional investors select the more promising ventures for their investment. The core purpose of the JOBS Act of 2012 as become fully effective in 2016 is to democratize and expand

the capital markets by incorporating smaller investors and thus bringing the market setting closer to an inclusive competitive market structure. However, as highlighted by the present study, there are possible rational outcomes in which crowdfunding could be wealth-reducing for the crowd. If future empirical studies verify emergence of such outcomes in the aggregate sense, then the regulatory agencies may have to reinstate some or all of the restrictive investor protection measures that existed in the legal paradigm prior to the JOBS Act of 2012. In view of such a prospect, protecting the crowd from crowdfunding losses could be in the best interest of fund seekers as a whole.

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