

“A BAD APPLE WENT AWAY”: EXPLORING RESILIENCE AMONG BITCOIN ENTREPRENEURS

Research in Progress

Ingram, Claire E., Stockholm School of Economics, Stockholm, Sweden,
Claire.Ingram@hhs.se

Morisse, Marcel, University of Hamburg, Hamburg, Germany,
Morisse@informatik.uni-hamburg.de

Teigland, Robin, Stockholm School of Economics, Stockholm, Sweden,
Robin.Teigland@hhs.se

Abstract

The emerging digital cryptocurrency Bitcoin has made waves in mainstream media across the globe, as have the numerous extreme events that have rocked it. One such event, the bankruptcy of a prominent Bitcoin exchange called Mt.Gox, particularly shocked the emerging sociotechnical field. However, it is not clear how the numerous entrepreneurial firms operating in this field survived this shock.

Studies of resilience in the face of extreme events have typically examined mature firms, characterised by formal structures and some slack resources. In such studies, the resilience, adaptability and transformability of the firm come into view. A new firm in an emergent field, however, is equally driven to survive – but must do so with far more limited resources, without a formal structure and little in the way of organisational learning. In our study, we find that such entrepreneurial firms rely on their collective identity in forming resilient responses. Furthermore, one outcome of this shock was a call for regulations and oversight – despite earlier dogmatic rejections of such formal control.

Keywords: Bitcoin, Entrepreneurship, Resilience, Extreme Event, Qualitative Study

1 Introduction

A number of entrepreneurs have built firms based entirely on the Bitcoin currency and protocol. However, when a symbol for all things Bitcoin, Mt.Gox - the global exchange based in Japan, declared bankruptcy in early 2014 amid accusations of theft and security failings, the field was shaken to its core. Not only is the Bitcoin field still emerging and relatively poorly understood, but the firms operating in the field are mostly entrepreneurial firms, without a formal structure, sufficient resources or organisational learning to rely upon. In the face of such a shock, how do these entrepreneurial firms survive?

There has been significant interest in Information Technology (IT) firms from both researchers and policymakers in recent years as tiny startups have rapidly grown into huge employers listed on stock exchanges. In order to achieve multi-million-dollar public listings, such firms have to survive shocks during their early operations. Indeed, as technology changes at a faster rate, these startups, or entrepreneurial firms, have not only to contend with the difficulties of being a newcomer (Stinchcombe, 1965) but also survive potential changes in their field of operations. Such fields offer a relatively new set of risks compared with other fields. For example, IT firms are typically built on sociotechnical systems that combine technical features to perform social functions (Davidsson and Vaast, 2010), unlike more traditional firms in which IT does not form a core part of their offering. Such a sociotechnical system may contribute to the robustness of these firms – or prevent them from being flexible.

This paper delves into the aftermath of an extreme event that affected entrepreneurs in one such sociotechnical field, that of Bitcoin. The most widely-used cryptocurrency, Bitcoin is based on a peer-to-peer technical protocol and is “a social structure based on networks operated by information and communication technologies” (Castells 2005, p. 7), or “networked society”. The paper first examines the existing literature around resilience and resilient behaviour by firms before introducing the empirical setting of Bitcoin. It then presents our research methods, some initial research findings and our anticipated next steps.

2 Entrepreneurship and Resilience

Entrepreneurship is “a creative and social/collective organizing process that materializes a venture” (Johannison 2009, p.137). While entrepreneurship involves the creation of a new firm, entrepreneurial firms also endeavour to weather the storms of both turbulence and extreme events. Despite their liability of newness (Stinchcombe, 1965), entrepreneurial firms have to gather what resources they can and behave in a resilient manner in order to survive. Indeed, resilience has been identified as important for entrepreneurial survival in the face of hardship (Bullough and Renko, 2013; Hayward et al., 2013; Ayala and Manzano, 2014). Firms in the field of Bitcoin are, to our knowledge, all new firms. They therefore all face resource limitations and the liability of newness, both as new firms and as firms in an emergent field; they are therefore a good example of an extreme case of an entrepreneurial firm that will aid us in generating theoretical insight (Eisenhardt and Graebner, 2007).

Studies of resilience in firms have typically investigated resilient behaviour in established firms. Among these firms, the possibility of an unforeseen event is ever-present with extreme events ranging from natural catastrophes (e.g., earthquakes) to man-made disasters (e.g., terroristic attacks) to accumulations of disruptions in organisational processes that threaten the firm (Vogus and Sutcliffe, 2007). Such unforeseen events often have a devastating effect on organisations and societies because a firm’s ability to react and adapt to such a shock may be overwhelmed (Gutschick and BassiriRad, 2003). Decision making during extreme events is a very complex task as it may involve multiple decision makers and typically involves time pressures and high levels of uncertainty (Mendonca, 2007). Moreover, the consequences of both the event and the reaction to the event may be broadly uncertain because such events are so rare that the firm has had limited opportunities to train for and learn from extreme events (Mendonca, 2007). To act and thrive under this harsh condition, individuals, organisations and even larger

sociotechnical systems have to show resilient behaviour (Horne, 1997; Mallak, 1998; Coutu, 2002; Hamel and Valikangas, 2003; Riolli and Savicki, 2003; Starr et al., 2003; Reimers et al. 2009).

While it is broadly agreed that resilience is “a fundamental quality of individuals, groups, organisations, and systems as a whole to respond productively to significant change that disrupts the expected pattern of events without engaging in an extended period of regressive behaviour” (Horne and Orr, 1998, p. 31), the definition of resilience is still contested. Abbadi (2011) and Wreathall (2006) emphasise stability and robustness and see resilience as the ability to return to a stable or productive mode as soon as possible. Other authors like Richardson (2002) or Lengnick-Hall and Beck, (2003) or Hamel and Valikangas (2003) underline the need for flexibility to adapt to the extreme event and “to move forward with even greater vigour and success than before” (Lengnick-Hall and Beck, 2003, p. 4). The definition used in this paper takes a middle road, accepting that resilient behaviour combines the mechanisms of flexibility and robustness “to proactively adapt to and recover from disturbances that are perceived within the system to fall outside the range of normal and expected disturbances” (Boin et al., 2010, p. 8).

Different patterns have been suggested to handle extreme events. Vogus and Sutcliffe (2007) suggest that the *ex ante* acceptance of residual risk is one major resilient strategy and that resilience can be improved by organizational learning. Alesi (2008) and Wynn et al. (2008) suggest that a rapid activation of additional resources (e.g., human, financial) during an extreme event allows for a resilient outcome. A special issue on the behaviour of established family firms found that in order to “avoid, absorb, respond to, and recover from situations that could threaten their existence” (Chrisman et al., 2011, p. 1107), family firms engaged in behaviour that would ensure their survival. This included arranging marriages to ensure management succession (Mehrotra et al., 2011), having a long-term orientation and multi-temporal perspective on their field of business (Lumpkin and Brigham, 2011), building knowledge and innovation structures (Patel and Fiet, 2011), and building social capital and engaging in social exchanges (Carr et al., 2011). Prior resilience identified in family business research included businesses’ *ex ante* abilities to act as efficient monitors (Lee, 2006) and effective stewards (Davis et al., 2010). One study of incumbent small real estate firms, with limited resources similar to entrepreneurial firms, found that firms could choose among strategies of inaction, resistance, adoption, and resilience. Relying on cognitive models of small business owners, the authors argued that the firms’ precise response depended on whether they had prior risk experience; thus, their response to external threats was a contingent one (Dewald and Bowen 2009).

However, mature and entrepreneurial firms face fundamentally different challenges, whether structural (Sine et al., 2006; Gilbert, 2005; Shane 2003) or resource-related (Mosakowski, 1998). Indeed, mature firms are typically characterised by formal structures and significant resources whereas entrepreneurial firms have more organic structures and fewer resources (Sine et al., 2006). Thus mature firms and entrepreneurial firms in the same field are likely to face different constraints – and thus respond differently. The difference in their responses is likely to be particularly stark when looking at resilience in an emergent field. Such fields are typically characterised by turbulence and uncertainty (Sine and David, 2003), something that further escalates during an extreme event.

Studies of resilience in entrepreneurship have looked at the cognitive resilience of *individual* entrepreneurs, finding that self-confidence breeds resilience, even after past failures (Hayward et al., 2013) and that hardiness, resourcefulness and optimism are predictors of entrepreneurial success, to varying degrees (Ayala and Manzano, 2014). This trait-based approach to entrepreneurship research has, however, been criticised for over-emphasising the agency of an individual entrepreneur (Davidsson and Wiklund, 2001). In its stead, both explorations of behavioural and cognitive issues among entrepreneurs (Shane and Venkantaram, 2000) and context and process studies of entrepreneurship (cf. Saraswarthy, 2001; Aldrich and Ruef, 2006; Steyaert, 2007) have emerged.

This research-in-progress paper draws on the process and behavioural studies of mature firms as well as an empirical study to take a first step in developing a processual model of entrepreneurial firm resilience.

It therefore asks the question: *How do entrepreneurial firms respond resiliently to extreme events in an emergent sociotechnical field?*

3 Setting the Stage: Bitcoin and the Mt.Gox event

Both a movement towards frictionless payment systems (Meiklejohn et al., 2013) and a rising lack of faith in centralised financial institutions (Teigland et al., 2013) have been noted among the reasons for the recent growth in cryptocurrencies. One of these cryptocurrencies, Bitcoin, has become the most widely used cryptocurrency to date, with a market capitalisation of just over 5 billion USD in November 2014 and 14 billion USD at its peak in December 2013 (Blockchain.info, 2014). Bitcoin comprises two parts: an open-source protocol (“the Protocol”) and a currency (“Bitcoin”). The first idea of the underlying cryptographic protocol was released in 2008 and subsequently posted as an open source project in 2009 by pseudonymous Satoshi Nakamoto, and a first open source user interface for Bitcoin was initiated. Nakamoto withdrew shortly thereafter, in 2010 (Teigland et al., 2013). The development of the Protocol has continued, as an open source project, by a small number of core developers and a larger number of other developers overseen by the Bitcoin Foundation. It has also been adapted for use in a number of other projects, including other cryptocurrencies and decentralised business models. While the use and commercialisation of Bitcoin have been driven largely by private individuals, Bitcoin users, developers and entrepreneurs have formed a strong global community.

Bitcoin users rely on the Protocol to receive and send payments over the internet. Participants in a Bitcoin transaction are anonymous and their transactions are peer-to-peer, with the enabling Protocol used to encrypt and verify a transfer from one user’s “wallet” to another’s. Every transaction passes through the Protocol where it is verified by a network of computers, or “Miners”, and entered into a common ledger, with copies stored on all of the Miners in the network. In exchange for their work in verification and encryption, Miners are rewarded in Bitcoin. The users on either side of the transaction are mostly anonymous although their IP address can be identified (Meiklejohn et al., 2013). Moreover, as the encryption, verification and transfer for each transaction is based on the Protocol, and transactions are publicly available through the ledger that is shared by Miners in the network, there is no need for trust in any individual actors. Its defining features are that the Protocol relies on cryptography, decentralisation and anonymity, while both the Protocol and Bitcoin are supported and enabled by a community of active supporters. It has also been adopted by a number of libertarians, who ascribe it a political identity, with its technical characteristics making it a tool for those who would like to conduct transactions that avoid detection and cannot be affected by any single actor, including law enforcement and central banks (Meiklejohn et al., 2013).

Soon after the introduction of Bitcoin, the first firms were formed to exchange bitcoins for fiat currencies like the Dollar and Euro. One major player in this market was Mt.Gox until it declared bankruptcy in 2014. Founded in 2010 and based in Tokyo, Japan, Mt.Gox received considerable interest from media and bitcoin users. At its prime, bitcoin-USD exchange rates released by Mt.Gox were cited as representing market prices by the media, its market share of USD-bitcoin exchanges was around 30 percent and Mt.Gox handled approximately 70 percent of all bitcoin transactions (Vigna, 2014). In February 2014, Mt.Gox announced that it was halting all withdrawals, citing security concerns and instabilities in the Protocol, or more specifically a so-called transaction malleability, i.e., a bug allowing a transaction sender to believe that the original transaction was not confirmed, as reason. At the end of February, Mt.Gox filed for bankruptcy in Japan, declaring around 600 000 bitcoins lost or stolen, although the exact amount lost is unknown (Decker and Wattenhofer, 2014). To date, no explanation of the event has been agreed upon. Transaction malleability was known to exist prior to the events surrounding Mt.Gox declaring bankruptcy and experts claim that this bug could not have caused such large losses (Decker and Wattenhofer, 2014). The bankruptcy of Mt.Gox is understood to be the most major shock for the emergent sociotechnical field to date. Not only was a prominent member of the Bitcoin community forced to resign very quickly, its bankruptcy made many question the security of both the Protocol and Bitcoin. Its demise has prompted a heated debate about the future development of Bitcoin. The events

described here, which revolve around Mt.Gox declaring bankruptcy, will be referred to hereafter as the “Mt.Gox event”.

4 Methods and Limitations

As the nature of our research question is to understand firms’ responses to extreme events, we decided to conduct a qualitative, interpretive study (Stahl, 2014) based on interviews with firms active in this emergent sociotechnical field, as an example of a “particularly revelatory” case (Eisenhardt and Graebner, 2007, p. 27). As Europe is a common economic area covered by a single set of rules as they relate to the treatment of Bitcoin and we are based in Europe, we confined our initial interviews to the geographical area of Europe.

We began our study by identifying relevant Bitcoin startups through reading Bitcoin-related blogs, news aggregators and other websites. We then tried to identify the individuals running these startups; however, interestingly, many did not disclose their location or a way to contact them or the name(s) of the individual(s) behind the firm. Nevertheless, we identified five startups across a variety of business operations (see Table 1) for the first round of interviews. We then conducted semi-structured interviews with the CEOs or founders of these startups over Skype, Google Hangout and, where possible, face-to-face.

Firm	Business model	Firm Age (Months, November 2014)
Firm A	Business Incubator and Consultant Services	20
Firm B	Exchange	33
Firm C	Retail Exchange	18
Firm D	Bitcoin Consultant Services and Hardware reseller	5
Firm E	Peer-to-peer Marketplace	39

Table 1: Table of Bitcoin entrepreneurial firms interviewed

The interviews were supported by a broad interview guide, which we fine-tuned for each interview. The guide was designed with four sections in mind: introductory questions, questions about the firm and the field prior to the Mt.Gox event, questions about their understanding of the Mt.Gox event and questions about Bitcoin, their firm(s) and the field after the Mt.Gox event. These interviews lasted 30-70 minutes each and were transcribed and, after reading and re-reading (Rice and Ezzy, 1999), coded using Atlas.ti. The coding process was iterative and we used a hybrid coding method (Fereday and Muir-Cochrane, 2006) with the themes partly grounded in the literature (Crabtree and Miller, 1999) and partly derived from the data (Boyatzis, 1998).

One of the limitations of this study is that in the Bitcoin ecosystem many firms choose to be anonymous; this means that our study may include an element of bias as the firms included chose not to be anonymous. In addition, it could be said that there is a survivor bias in that the firms interviewed survived the crisis; something which we tried to mitigate against but struggled to identify firms that had failed in this period.

5 Initial Findings

Although we covered several topics during our interviews, we devoted our initial analysis to a rigorous examination of the entrepreneurial firms’ responses and justifications of their responses to the collapse of Mt.Gox (See Table 2).

Before we began the interviews we discussed the likely possible strategies by these Bitcoin entrepreneurs, considering the possible technical, financial and social responses to the event. Among the responses that these firms used, many were unsurprising. Among the less surprising ones were the fact that the firms undertook internal security and financial checks, which they then publicised via blogs and other online communication methods, to reassure their clients and other actors of their safety and solvency.

Open codes	Axial codes	Selective coding
Performed a cryptographic audit (Bitcoin funds)	Check security systems	Technical Response
Confirm client funds (Fiat funds)		
Other actors hold too many Bitcoins	Acknowledgement of system vulnerabilities	Internal social response
Firm(s) less willing to hold Bitcoins for clients		
Recommend diversification of Bitcoin holdings (“cold” wallets and multiple providers)		
Performed a cryptographic audit	Re-assessment of decentralisation	
Call for regulation		
Propose third party oversight		
“Wait and see”	“Wait and see”	
Performed a cryptographic audit	Reassure clients	External social response
Confirm client funds		
Communicate with clients through blogs		
Media blew it out of proportion		
Mt.Gox were amateurs	Distancing Strategy	
Mt.Gox were thieves		
Media blew it out of proportion		

Table 2: List of codes developed in interview coding

Some of the more surprising responses were grounded in the entrepreneurs’ faith in both the Bitcoin protocol and the Bitcoin community. Among these responses was the strong sense that because the protocol was quite secure and robust, businesses built on it could afford to be reactive, rather than proactive, in their risk management:

[Do you have a risk management system?] Not really a system, we talk to each other and figure it out, that's essentially what we're doing and try to take actions based on what we do there. - Firm C

Similarly, their faith in the protocol was so strong that they argued that it must have been the actions of Mt.Gox that led to its eventual bankruptcy. The more charitable of the firms suggested that the Mt.Gox founder and employees were inexperienced, while others suggested that Mt.Gox had engaged in unethical or illegal behaviour:

"The other thing, that I think is more likely if you analyse some of the data, is [that] they actually used customers' deposits in US dollars to buy Bitcoins on the exchange to pump up the price of Bitcoins... [and] at some point... they ran out of US dollars and then some of the Bitcoins are apparently gone, so perhaps 600 000 were stolen - by someone inside." - Firm C

The narrative that the protocol itself was unassailable was a very strong one, with the firms emphasising that what happened to Mt.Gox could never happen to them, as well as that reporting suggesting that the event impacted or affected the Bitcoin field was an exaggeration:

"But, if the press has found a topic, then even the smallest incidents will be the headline, [...] and that means each small technical problem at any Bitcoin service provider will be hyped immediately and might lead to another press headline." - Firm E

Although not all of the firms thought that Mt.Gox had engaged in illegal or unethical behaviour, they acknowledged that it did make them re-think some of the human vulnerabilities in the system. For instance, most of the firms said that both users and businesses should hold their own bitcoins themselves in a wallet that only they had access to. They also recommended only holding small amounts in each individual wallet. For businesses with large Bitcoin holdings they recommended having "cold" wallets - wallets not connected to the internet:

"I think the most important is diversification ... you should never store Bitcoins at the exchange... [you should] diversify the funds: so a little bit at your phone and a little bit at your tablet and a little bit at your laptop or personal computer and then a little bit here in this app and little bit there. So if something goes wrong you don't lose all your money but just a small part." - Firm D

Implicit in this discussion around diversification is the idea that although the Bitcoin protocol itself may be very robust, the entrepreneurs believed that there were unethical actors still at work in the Bitcoin field. Indeed, some interviewees explicitly stated that there were a great many scams operating that used Bitcoin. The impact that these individuals and businesses could have on the field was, however, of little concern to the entrepreneurs as they believed that:

"[A] customer of Mt.Gox can distinguish between a problem at a service provider and a presumed problem of the Bitcoin system, because the Bitcoin system is still working fine." - Firm E

Nevertheless, the presence of these rogue actors led some of the entrepreneurs to call for more regulations around how Bitcoin firms should operate and how Bitcoins themselves should be handled. Suggested regulations included security procedures, transparency requirements and possible audits by third parties:

"It doesn't need to be the government but maybe some private company like PWC or some like this to control what they do. And if they have the control I believe they may become successful." - Firm D

Ultimately, the interpretation of the Mt.Gox event was that it had a positive effect on the Bitcoin field as it drove entrepreneurial firms to examine how they conducted business as well as potential vulnerabilities in the field, with one entrepreneur saying that although Mt.Gox was a standard-bearer for a time, they interpreted their bankruptcy as an instance in which “...A bad apple went away...” (Firm B).

6 Analysis

One of the most interesting initial findings in this research was the importance of the underlying community and its collective identity for resilience. Although this was not something that we deliberately coded for, and hence is not included in the table of codes above, it emerged clearly from the text. This community and identity framed how the entrepreneurs saw the Mt.Gox event and what they thought of as an appropriate response to the event. Both in the interviews and in our examination of a number of Bitcoin-related articles, the technical characteristics of the protocol were also attributed a social identity. For instance, the technical characteristic of a decentralised system is suggested to be a positive social feature because it means that the currency is not subject to any central oversight. This entanglement of the social and technical characteristics suggests an initial, unified, sociotechnical collective identity that we would like to examine further in the next phase of our research.

Another finding, informed by the collective identity shared by these Bitcoin entrepreneurs, was the belief that a) the technology itself was unassailable, and thus b) that the field was unassailable. Despite Mt.Gox itself saying that there were technical flaws in the Bitcoin system, the entrepreneurs both did not believe them and relied on the robustness of the technical system in deciding what was an appropriate response to the Mt.Gox event. Moreover, they built their business models on the technical system, arguing that the robust technical system gave them the freedom to be flexible and “wait and see” when it came to their business model. Thus, although the entrepreneurs emphasise the importance of resilience-as-stability in their narrative, the fact that they could afford to wait and see implies that they believed their firms to be flexible enough for them to pivot if later shocks required it.

The strength of this collective identity and belief both in the protocol and in the underlying Bitcoin community, according to the entrepreneurs, gave them flexibility in their strategies. One of the technical characteristics of the Bitcoin system noted several times in relation to resilient strategies was decentralisation; these entrepreneurs strongly recommended that users not keep their Bitcoins in a single, central place. However, despite arguing that doing this in practice - and the ability to do this in general - was a strength of the Bitcoin field socially as well as technically, many of them argued for centralisation in other areas. In particular, some entrepreneurs argued that the Bitcoin field needed more regulation in order to keep businesses and users safe and to build confidence in the system.

In the same vein, the perceived importance of the community was reflected both in the language that the entrepreneurs used and in the stark line that was drawn between “insiders” and “outsiders”, with insiders presumed to be somewhat Bitcoin-savvy and outsiders depicted as ignorant and possibly even guilty of malicious intentions towards Bitcoin. On closer inspection, this insider-outsider narrative is consistent with the initial reasons given around why Bitcoin as both a currency and a protocol was necessary; namely because existing actors like banks and central governments did not have the best interests of the ordinary person at heart, whereas Bitcoin as a decentralised and anonymous currency did.

7 Next steps

In this paper, initial findings have been presented. Nevertheless, a complete picture of resilience in an emerging sociotechnical field has not yet been found. Our next steps include enlarging our empirical study to include more entrepreneurs and additional archival data. One additional area of study could include investigating the extent to which resilient strategies are contingent, given how there was no single understanding of what actually happened that led to the Mt.Gox event. This may include teasing out the reciprocal and dynamic relationship between the entrepreneurial firm and other actors in the

field, including Bitcoin users, banks and policy makers, insofar as they relate to resilience. Another additional area could be an investigation of this field's collective identity, its intertwined sociotechnical nature and its possible relationship to the resilience of both the individual entrepreneurial firms and the broader field. Another possibility might be to conduct a cross-case study comparing resilience in the Bitcoin field with another cryptocurrency or emergent sociotechnical field.

In terms of methods, we anticipate recoding and reanalysing our empirical data using a more data-driven approach (Boyatzis, 1998), both to ensure that we are rigorous in our analysis and to open up the possibility of engaging in grounded theory-inspired theory development.

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