CREATING VALUE FROM THE OUTSIDE IN OR THE INSIDE OUT: HOW NASCENT INTERMEDIARIES BUILD PEER-TO-PEER MARKETPLACES

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Abstract

Peer-to-peer marketplaces have fueled the growth of the sharing economy. Despite their proliferation, little systematic evidence and theory exists on how nascent intermediaries build this particular two-sided market. I examine this process through a value creation lens, focusing on how nascent intermediaries govern producers' and consumers' participation. Emerging insights from a theory building multi-case study suggest nascent intermediaries' governance choices are associated with controlling supply-side heterogeneity and cross-side interactions, albeit to a different extent (low, high, or balanced). Shifts in intermediaries' intensity of control over time reveal two alternative value creation processes. Intermediaries creating value "from the outside in" transition from low to high control of both aspects of participation. They initially open participation to all willing producers while they support producers' and consumers' autonomy in determining the terms of their transactions, but subsequently enforce strict control so as to encourage producers' and consumers' conformity to desirable behaviors. Alternatively, intermediaries creating value "from the inside out" continuously balance low and high control of at least one aspect of marketplace participation. They initially recruit a qualified core of producers, who they later leverage to recruit more qualified ones. At the same time, they transition from low to balanced control of cross-side interactions by leveraging producers' and consumers' resources and contributions. These findings highlight the unique value creation challenges in peer-to-peer marketplaces as well as the evolving role of intermediaries and customers in value creation. Implications for research on business models and value cocreation are also discussed.

Key words: sharing economy, value creation, peer-to-peer marketplaces, multi-sided platforms, qualitative research methods (general), strategy process, business models,

INTRODUCTION

Digital peer-to-peer marketplaces have been foundational the growth of the sharing economy, enabling individuals to transact directly with one another at an exceptionally large scale (Colby & Bell, 2016; Owyang & Cases, 2016; Sundararajan, 2016). Conceptually, a peer-to-peer marketplace can be thought of as a particular type of two-sided market, in which an intermediary facilitates transactions and other types of interactions between two interdependent customer groups such as supply-side and demand-side participants or producers and consumers (Armstrong 2006; Caillaud & Jullien 2003; Eisenmann, Parker & Van Alstyne, 2006; Parker & van Alstyne, 2005; Rochet & Tirole 2003b; 2006).

For nascent peer-to-peer intermediaries, producers' and consumers' interdependency creates a chicken and egg problem that challenges early-stage value creation. Specifically, the benefits producers experience from transacting within a particular two-sided marketplace (e.g. decreased transaction costs) increase with the number of consumers and vice versa. But in nascent two-sided marketplaces, a critical mass of participants on both sides of the marketplace does not yet exist and is thus not a compelling source of value (Caillaud & Jullien, 2003; Rochet & Tirole, 2003b). According to research on multi-sided platforms, subsidizing the cost of participation for one or both sides of the market provides initial participants with sufficient incentive to join a two-sided marketplace even in the absence of critical mass and transactional efficiencies (e.g. Armstrong, 2006; Bolt & Tieman, 2008; Chen, 2008; Hagiu, 2006; 2009; Rochet & Tirole, 2003b; 2006). However, several studies have criticized this exclusive focus on critical mass and transactional efficiencies, suggesting that the sources of value and the early-stage value creation process in two-sided markets may be poorly understood (e.g. Gawer, 2014; Hagiu & Jullien, 2011; Boudreau and Hagiu, 2009; Wareham, Fox & Cano Giner, 2014).

The proliferation of peer-to-peer marketplaces, a relatively new type of two-sided market, provides a timely opportunity to develop more nuanced theories of early-stage value creation in two-sided markets. Doing so may be partly achieved by examining value creation challenges in peer-to-peer marketplaces while considering how they may differ from those in other types of two-sided markets. Gawer's (2014) classification of technological platforms into internal, supply chain and industry platforms suggests that the types of marketplace participants, their contributions to value creation as well as the means through which platform providers govern marketplace participation may explain different approaches to value creation in two-sided markets. Moreover, research on video game platforms (e.g. Boudreau & Jeppesen, 2014; Hagiu & Lee, 2011; Schilling, 2003), credit card payment systems (e.g. Rochet & Tirole, 2003a; Rysman, 2007; Sun & Tse, 2007), and operating systems platforms (e.g. Evans, 2003) typically views value creation as a function of diffusing technical standards and operating policies, which govern how complementors can contribute to value creation (Adner & Kapoor, 2010; Boudreau, 2010; Cennamo & Santalo, 2013; Parker & Van Alstyne, 2005; Rochet & Tirole, 2003b; Shankar & Bayus, 2003; Zhu & Iansiti, 2012; Wareham et al, 2014). But in peer-to-peer marketplaces, supply-side participants are not technological complementors but individuals using their existing assets and knowledge to meet consumers' heterogeneous needs (Benoit, Baker, Bolton, Gruber & Kandampully, 2017; Sundararajan, 2016). In other words, the varied resources, needs and behaviors individuals bring to a peer-to-peer marketplace may not be solely or adequately controlled by technical specifications or formal rules, and may thus require the use of governance mechanisms different from those in technology platforms.

Prior research suggests that governing individuals' heterogeneous contributions to a peer-to-peer marketplace is primarily resolved by crowdsourcing quality control, i.e. through seller

reviews (e.g. Dellarocas, 2003). Although ratings and reviews have been particularly effective in building marketplaces such as eBay where the characteristics of a product are observable before consumers commit to purchasing it, peer-to-peer marketplaces increasingly facilitate service-based transactions such as temporary rental of spare rooms or ride sharing (Baumeister & Wangenheim, 2014; Cohen & Sundararajan 2015; Fraiberger & Sundararajan, 2015; Hartl, Hofmann, & Kirchler, 2015). In this case, the comfort of a rented room or the safety of a ride can only be accurately evaluated *after* it is experienced (Mills & Margulies, 1980). The uncertainty surrounding the quality of a producer's offering is further exacerbated when transactions require producers and consumers to interact offline, and thus outside the direct purview of the intermediary. But how nascent peer-to-peer intermediaries govern participation and resolve these uncertainties so as to create value for, and recruit initial participants is both underexplored and undertheorized. Finally, more nuanced theories of value creation in two-sided markets should account for the evolution of two-sided markets and consider the role of customers as collaborators rather than as "simple consumers" in the value creation process (Gawer, 2014: 1241). This study thus asks: *How do nascent intermediaries create value for initial marketplace participants and govern marketplace participation when building peer-to-peer marketplaces? How does this process unfold over time?*

Given the lack of empirical evidence and limited theory on early-stage value creation processes in peer-to-peer marketplaces, I conducted a theory-building multi-case study suitable for studying new phenomena (Eisenhardt, 1989; Yin, 2008) and collected longitudinal data so as to facilitate the development of process theory (Langley, 1999; Van de Ven, 1992). Data were collected from nine peer-to-peer intermediaries which had, at the beginning of this study, recently launched and were actively building peer-to-peer marketplaces. Findings suggest that

nascent peer-to-peer intermediaries sought to create value through the continuous and concurrent use of two distinct types of control: control of supply-side heterogeneity, and control of cross-side interactions. The former was concerned with the variance in producers' offerings and qualifications (e.g. product and geographic scope of offerings, participants' assets, knowledge, skills) as well as their personal interests and values, whereas the latter was concerned with producers' and consumers' interactions throughout the transaction cycle. By governing marketplace participation using these two levers, nascent intermediaries sought to support, promote and monitor participants' conformity to desirable behaviors. But over time, intermediaries followed alternative paths towards achieving this goal, evidenced by shifts in the level of control exercised over participants and their interactions. Creating value "from the outside in" began with intermediaries imposing few limitations to who could become producer (low control of supply heterogeneity) while providing both sides with the freedom to determine key transaction terms (low control of cross-side interactions). This relatively hands-off approach to governing marketplace participation facilitated early-stage growth but exposed intermediaries to the risks of participants' non-conformity. In response, intermediaries both limited participation (high control of supply heterogeneity) and governed strictly the conditions under which the two sides interacted (high control of cross-side interactions) in pursuit of greater levels of participant conformity.

Alternatively, creating value "from the inside out" exhibited a relatively stable focus on balancing low and high control of at least one aspect of marketplace participation. It continuously limited some aspects of supply-side participation and allowed freedom in others throughout the observation period (balanced control of supply heterogeneity). The continuous presence of balanced control supported the creation and maintenance of a relevant core of

participants—qualified individuals with particular resources, values and interests. Such relevant participants were likely to confirm and were thus given freedom to interact freely (low control of cross-side interactions). However, the influx of less and less relevant participants challenged conformity and motivated intermediaries to shift towards greater, but nonetheless moderate, oversight over transactions (balanced control of cross-side interactions). These findings enrich existing theories of platform governance and contribute to new theory development by advancing a processual and behaviorally-informed perspective on value creation in two-sided markets. Implications for the evolution of business models and value cocreation are also discussed.

THEORETICAL BACKGROUND

Peer-to-peer marketplaces can be thought of as a particular type of two-sided marketplace, which enables direct interactions among two groups of interdependent customers (Armstrong 2006; Caillaud and Jullien 2003; Parker and Van Alstyne, 2005; Rochet and Tirole 2003b; 2006). In building two-sided marketplaces, intermediaries face complex coordination challenges unlike those in traditional "one-sided" models such as resellers (Hagiu & Wright, 2014). In the traditional value chain, firms acquire inputs and bundle them into products and services by carrying out activities such as marketing, distribution and customer service within the boundaries and under the oversight of the firm (Porter, 1985). But in two-sided markets, firms increasingly adopt an "asset-light paradigm" focused on enabling interactions between resource holders and consumers rather than own and sell inventory (Sundararajan, 2013). In this new paradigm, firms increasingly create value by integrating their own resources with those owned by customers, suppliers, users and other ecosystem participants (Amit & Han, 2017; Thomas, Autio & Gann, 2014). This cocreative approach to value creation also allows firms to gain otherwise difficult to obtain insights on consumer preferences and fill unmet needs (Amit & Han,

2017) thereby increasing the value pie for all marketplace participants (Garcia-Castro & Aguilera, 2015; Tantalo & Priem, 2014).

Bu intermediaries' resource deployment when building technological platforms appears to be very different from resource deployment when building peer-to-peer marketplaces. In the former case, value is created by configuring complementors, consumers and other market actors around a technological core. Doing so requires creating, diffusing and managing a platform technology as well as the rules for developing platform-compatible offerings (e.g. Schilling, 2003; Wareham et al, 2014). For example, credit card payment technologies provide financial institutions, businesses and consumers a common technology for transacting (e.g. Rochet & Tirole, 2003a; Rysman, 2007; Sun & Tse, 2007). Video game platforms provide a common technology through which video game developers reach consumers and vice versa (e.g. Boudreau & Jeppesen, 2014; Cennamo, 2016; Cennamo & Santalo, 2013; Hagiu & Lee, 2011). Similarly, computer operating systems provide a common technological interface for software developers and users (e.g. Ceccagnoli et al, 2012; Wareham et al, 2014). These technological and standards decrease transaction costs for both sides (Armstrong, 2006; Caillaud & Jullien, 2003; Parker & Van Alstyne, 2005; Rochet & Tirole, 2003b, 2006; Wareham et al, 2014) whereas operating policies such as exclusivity agreements allow consumers to access a product or service unavailable elsewhere (Armstrong & Wright, 2007; Hagiu & Lee, 2011). To deliver these benefits, intermediaries must often enroll complementors before a critical mass of consumers exists (Hagiu, 2014), or develop complements in house (Schilling, 2003).

But recent theorizing has suggested peer-to-peer intermediaries deploy resources differently from platform providers (e.g. Amit & Han, 2017). Rather than require complementors' technological or specialized expertise to satisfy consumer needs, peer-to-peer

intermediaries match supply-side participants' existing resources with consumers' needs (Amit & Han, 2017; Benoit et al, 2017). To do so successfully, they may also need to manage participants' inexperience and cognitive biases (Benoit et al, 2017) as well as appeal to individuals' non-economic motivations (Belk, 2014; Benoit et al, 2017). Simply put, the focus of intermediaries' resource deployment, the types of supply-side participants and the means of supply-side participation appear relevant in distinguishing peer-to-peer marketplaces from technology platforms and highlight the unique value creation challenges in peer-to-peer marketplaces. Table 1 summarizes their differences.

Insert Table 1 here

Despite these differences, value creation in both technological platforms and peer-to-peer accelerates depends on the number of supply-side and demand-side participants. A critical mass of participants is necessary for improving transactional efficiencies (Evans, 2003; Rochet & Tirole, 2006); the more participants join and transact with one another, the lower search costs they incur, and the more efficient their transactions become. At the same time, critical mass and rising transactional efficiencies help recruit new participants. In the platform literature, getting to critical mass is typically viewed through a pricing lens. Subsidizing the costs of participation for one or both sides of the marketplace reduces participation costs and thus facilitates the recruitment of initial participants (Caillaud & Jullien, 2003; Parker & Van Alstyne, 2005). Although critical mass, transactional efficiencies and subsidies provide marketplace participants with powerful incentives to join and transact through a new two-sided marketplace, scholars have advocated either implicitly or explicitly for developing more complete theories of value creation in two-sided markets (e.g. Gawer, 2014; Hagiu & Jullien, 2011). For instance, Hagiu

and Jullien (2011) have questioned the long-held assumption that transactional efficiencies are necessary for value creation, showing intermediaries may choose to increase consumers' search costs so as to generate evidence of traffic (Hagiu and Jullien, 2011). Additionally, Gawer (2014) has argued that the focus on subsidies treats participants as "simple consumers" with stable motivations across time rather than as active contributors to value creation (Gawer, 2014:1241).

In part, the lack of more nuanced explanations of value creation in two-sided markets has emanated from dominant methodologies—formal models and single cases. Although formal models parsimoniously predict demand based on pricing and competitive considerations (e.g. Hagiu & Lee, 2011; Sun & Tse, 2007; 2009), they overlook process dynamics as well as the additional governance activities (Gawer, 2014; Wareham et al, 2014). Moreover, single cases have examined how *established* platform providers protect their competitive positions over time (e.g. Gawer & Henderson, 2007) or how they utilize their market power to secure complementors' participation in new generations of platform technologies (Wareham et al, 2014). Gawer and Henderson (2007), for example, studied Intel's growth between 1990 and 2004 nearly twenty years after Intel was founded and when "Intel was clearly a platform owner" (Gawer and Henderson, 2007: 7). But these insights find limited application to nascent intermediaries without existing customers or abundant resources (Brush, Greene & Hart, 2001), with little market power or legitimacy (Singh et al, 1986).

In sum, a systematic study of the value creation process in peer-to-peer marketplaces can enrich existing theories of value creation in two-sided markets as well generate new evidence and theory on the increasingly prevalent phenomenon of the sharing economy. Leveraging these opportunities, this study examined the following research questions: *How do nascent intermediaries create value for initial marketplace participants and govern marketplace*

participation when building peer-to-peer marketplaces? How does this process unfold over time?

RESEARCH METHODS

Given the dearth of evidence and theory on value creation processes in nascent peer-to-peer marketplaces, I carried out an inductive multi-case study suitable for studying poorly understood phenomena and new theory development (Eisenhardt, 1989; Yin, 1994). Multiple cases facilitated the use of replication logic useful for confirming or disconfirming patterns across cases, and for generating generalizable and robust theory "more deeply grounded in varied empirical evidence" than theory developed from single cases (Eisenhardt & Graebner, 2007: 27). Finally, longitudinal data enabled the observation of temporal patterns and the emergence of process theory (Langley, 1999; Van de Ven, 1992).

Case Sampling

Based on insights from twenty pilot interviews and prior research on two-sided marketplaces, I selected theoretically-relevant cases (Miles & Huberman, 1994) based on their stage of development (recently launched without a critical mass of participants); the types of supply-side participants (individuals); and the means of supply-side participation (selling or renting pre-owned assets, and providing various services). The former criterion was necessary for observing early-stage value creation whereas the latter two criteria point to distinct value creation challenges facing peer-to-peer intermediaries. I initially determined the stage of each intermediary through publicly available sources such as websites and popular press articles as well as my own observations when registering and using its marketplace. In the first interview, I verified marketplace launch dates, the number of supply- and demand-side participants and whenever possible, revenue incurred up until that point.

Data Sources

Primary data were collected through repeated semi-structured interviews between 2014 and 2016. Forty interviews with founding teams, early employees, board of directors, advisors, and investors produced approximately fifty-three recorded hours. Repeated interviews were useful in minimizing recollection bias, triangulating findings (Jick, 1979), and focusing on decisions and actions rather than ideas never pursued. Table 2 provides an overview of case data collected from nine cases.

Insert Table 2 here

To facilitate triangulation, I also collected observational from attending meetings, and archival data based on newsletters, press releases, website archives, blog archives, email updates, company profiles from AngelList and CrunchBase, and informants' LinkedIn profiles. In one case, I was able to gain access to company archives of marketing and customer service emails. In three cases, I also collected archives of messages exchanged between supply-side and demand-side participants. These data are listed in Table 3.

Insert Table 3 here

On average, interviews lasted seventy-eight minutes, ranging from half hour to two hours. In the first interview, I mentioned my interest in how nascent intermediaries built peer-to-peer marketplaces and inquired about informants' decisions and actions that helped or hindered the creation and growth of their nascent marketplaces. I also asked informants about their motivation for founding or joining the founding team, prior and current challenges, founding team composition, funding sources, evolution of technological features, milestones achieved or

missed, and future plans. In the first interview, I focused primarily on clarifying meanings, and defining technical or industry-specific terms. In subsequent interviews, I followed up on unresolved issues mentioned in prior interviews; and inquired about new decisions, actions, and progress since the previous interview. I used repeated interviews to check my own understanding of prior events, delve deeper into recurrent topics, and garner informants' reactions to themes that emerged from multiple rounds of data analysis. All interviews were transcribed into text. Pseudonyms for company names used in all written output ensured company and informant anonymity.

Data Analysis

To facilitate the use of replication logic across cases, I began data analysis by constructing case histories (Eisenhardt, 1989; Eisenhardt & Graebner, 2007) and subsequently created visual representations of the evolution of decisions and actions for each case (Langley, 1999). To facilitate later cross-case comparisons and the observation of a "surface pattern" (Gehman et al, 2017: 21) across various activities, I organized case histories into recurring topics including offering, value proposition and vision; launch and prototype milestones; technology features and their evolution; geographic scope choices; key partners; resource endowments (e.g. incubator participation, funding levels, team members, revenue, and numbers of participants), and pricing structures. These data organizing steps began to elucidate the connections between intermediaries' actions and value creation. For instance, they helped me identify the role of particular tactics (e.g. marketing campaigns) in defining the attributes of each firm (e.g. its value proposition) and in reaching various milestones (e.g. acquiring initial producers). At this point, I identified intermediaries' beta launch of their websites as the onset of the observation period so that all subsequent analyses examined patterns within the same "early stage" period.

As is typical of inductive theory development, I sought theoretical explanations of activities observed by iterating between existing literature and the data (Glaser & Strauss 1967). In line with platform economists' expectations, reaching critical mass was a common and unsurprising motivator of intermediaries' decisions. But at the same time, intermediaries were particularly concerned with marketplace participants' conformity to desirable behaviors. This finding led to additional rounds of analysis including the creation of tables with quotes and summaries of actions observed (Miles & Huberman, 1994). In reflecting on the intended impact of informants' decisions and actions on participants' behavioral conformity, I concluded that at a general level, their decisions and actions aimed at governing two distinct aspects of marketplace participation: supply-side participation and cross-side interactions. I also observed different levels of intensity (low, high and balanced control) with which marketplace participation was governed. Based on these insights, I developed a coding scheme, presented in Table 4, for assigning frequently occurring governance activities into different levels of control. Subsequent analysis eventually resulted in grouping the majority of observed decisions and actions into these three levels of control (Boyatzis, 1998; Headland, Pike, & Harris, 1990).

Insert Table 4 here

Eventually, explicating the process of value creation entailed tracking intermediaries' evolution of governance choices over time (Langley 1999; Van de Ven, 1992). To this end, I initially focused on explicating shifts in control looking for similarities across cases (Eisenhardt & Graebner, 2007). But two cases in particular (Print-In-3D and Spokes) appeared to pursue distinctly different paths to value creation. As a result, I tracked shifts in control in these two cases, and gradually refined the two emergent process models by examining whether and how

each process was replicated in the remaining cases. Similar to process studies, which have observed alternative paths leading to the same goal (e.g. Hallen & Eisenhardt 2012; Pache & Santos, 2013), this study eventually uncovered two alternative but equifinal value creation processes. Each process entailed a different sequence in which intermediaries shifted control over time, but ultimately both processes sought to support, promote and monitor participants' conformity to desirable behaviors. Note that eventual performance outcomes were not salient to this analysis. Instead, my goal was to identify patterns in the value creation process.

FINDINGS AND THEORY DEVELOPMENT

Findings suggest that nascent peer-to-peer intermediaries sought to create a peer-to-peer marketplace in which individuals on both sides of the marketplace conformed to desirable, i.e. appropriate and value-creating behaviors. On the supply side, for example, producers exhibiting desirable behaviors typically listed offerings in line with intermediaries' expectations of quality and scope; were honest and used appropriate language when communicating with consumers; responded promptly to questions; and priced offerings fairly. But participants' inexperience in operating as producers, as well as their lack of knowledge or skills in determining transaction terms often challenged value creation. The founder of Ship-N-Go, a marketplace for drivers and shippers, explained:

> "The challenge for the driver is the fact that they may start bidding on something that they don't actually know how to transport and they may completely underestimate what it's going to cost them. When they sit down and say "actually I'm going to make a huge loss from this because I didn't think about the fact I'm going to have to pay for gas, wear and tear, and hotel," then they cancel last minute. That's a challenge; making sure that the Joe off the street is actually bidding and behaving responsibly." (personal interview, July 2015)

To address similar challenges and eventually create a marketplace in which the majority of participants conformed to desirable behaviors, nascent peer-to-peer intermediaries created value for, and recruited initial participants by governing two key aspects of participation in their

nascent marketplaces: supply-side heterogeneity, and cross-side interactions. Over time, however, they modified the intensity at which they governed these key aspects of marketplace participation. Next, I discuss each type and level of control but in the interest of brevity, I provide more detailed evidence of each one when discussing my process findings.

Value Creation Mechanisms in Nascent Peer-to-Peer Marketplaces

Control of supply-side heterogeneity. Controlling supply-side heterogeneity was concerned with managing the variance in producers' offerings and qualifications (e.g. product and geographic scope, participants' assets, knowledge and skills) as well as their interests (e.g. hobbies) and personal values (e.g. concern for their environment). It is worth noting that almost all cases (with the exception of Grasshoppers) intentionally governed only supply side participation while they allowed virtually anyone to join the demand side. Spokes' chief marketing officer explained:

> "Generally speaking, the demand is a lot easier to control than the supply. At any one time, we probably have 50% to 60% more demand than we have bikes system-wide" (personal interview, July 2016).

Intermediaries typically governed supply heterogeneity through recruitment strategies, verifications of producers' identity and qualifications, specifications for the permitted geographic location or product category of offerings, reputation building activities, and partnerships. When intermediaries exercised low control of supply heterogeneity, they recruited or allowed any willing producers to join the marketplace including individuals as well as firms, even though their marketing messages and other communication with external stakeholders described their marketplace as a "peer-to-peer" one. Inclusion of all interested producers was facilitated through online, and occasionally offline, recruitment efforts. It was also manifested in requesting producers to provide a single proof of identity and little, if any evidence of their qualifications or

the quality of their offerings; imposing few limitations to the location and market category of offerings; and welcoming any willing partners as well as all any positive media coverage.

In contrast, when intermediaries exercised high levels of control, they carefully selected and vetted potential producers, and even ostracized ones who had already created listings that did not meet the intermediary's expectations of quality or appropriate behaviors. This logic of exclusion was also manifested in requesting multiple identity verifications; showcasing participants with relevant certifications; limiting the product and/or geographic scope of permitted offerings; and selectively working with partners and the media. Finally, exclusion was also facilitated by recruiting producers offline, where prospective producers' characteristics and behaviors could be directly observed.

Emerging from the data was a third approach to controlling supply-side heterogeneity, seeking to balance low and high control. Balancing appeared driven by the need to integrate the benefits of exclusion (a relevant core of producers) with the benefits of inclusion (large numbers of producers). Balancing low and high control manifested in recruiting and vetting a core group of initial producers based on their personal values and non-financial interests while welcoming any willing producers to participate either within certain parameters (e.g. location, product categories) or in the future (e.g. when the intermediary would expand to their location). Recruitment occurred both online and offline recruitment, but online recruitment was used primarily for following up with relevant prospects that had already been identified in tradeshows or other offline events.

Control of cross-side interactions. In addition to controlling supply heterogeneity, intermediaries also controlled the conditions under which participants could interact before, during and after the completion of a transaction. Intermediaries typically governed cross-side

interactions through matching algorithms, messaging functionality, policies related to pricing, customer service and other key transaction terms, audits or reviews, and insurance. When intermediaries exercised low control of cross-side interactions, they supported transacting parties' freedom in negotiating transaction terms and in resolving complaints or issues on their own. By encouraging participants' autonomy, this value creation logic also appeared to facilitate the personalization of offerings as well as effective use of scarce resources. Spokes' chief marketing officer explained:

> "Instead of trying to regulate our market, people—about 99% of them—will inherently do the right thing and probably do a better job than what I could do by regulating. So instead of trying to say 'you have to do this, this and this,' we just allow them to do it on their own and then address the 1% instead of trying to monitor the 99%. I find that's a more effective use of our time." (Spokes chief marketing officer, personal interview, July 2015)

In contrast, high control of cross-side interactions typically manifested in influencing or strictly monitoring transacting parties' interactions throughout the lifecycle of a transaction. Specifically, intermediaries controlled the matching process through search algorithms or by manually routing incoming orders to specific producers. They often limited information flows between the two sides throughout all stages of a transaction. In some case, they fixed the price level at which the two sides could interact, mandated customer service policies, and mitigated transaction risk by offering both producers and consumers the opportunity to purchase insurance. To monitor conformity, some intermediaries also audited the quality of service without making the results of those audits publicly available.

Finally, emerging from the data was also a balanced approach to controlling cross-side interactions. Balancing in this case appeared focused on integrating the benefits of participant autonomy (transaction outcomes achieving a close fit between producers' resources and consumers' preferences) with the benefits of monitoring participants' interactions (transaction outcomes meeting intermediaries' expectations of quality or adhering to appropriate behaviors).

Balancing was manifested in the form of limitations to direct communication between transacting parties prior to committing to a transaction, and unrestricted communication after the commitment was made; bi-directional reviews, which allowed intermediaries to monitor both behaviors as well as transaction outcomes with the help of participants; and pricing recommendations. To mitigate some transaction risk, intermediaries balancing low and high control typically reassured transacting parties that the intermediary would become involved only if transacting parties could not resolve issues autonomously. Table 5 summarizes findings related to low and high control of supply-side heterogeneity, including underlying value creation logics and key activities.

Insert Table 5 here

Value Creation Processes in Nascent Peer-to-Peer Marketplaces

Shifts in intermediaries' intensity of control of supply-side heterogeneity and cross-side interactions revealed two distinct processes of value creation. The first process entailed transitions from low to high control on at least one aspect of the marketplace participation whereas the second process exhibited a relatively stable focus on balancing low and high levels of control throughout the observation period. Next, I discuss each process in more detail and provide supporting evidence from each case. Table 6 provides a high-level summary of observed shifts in control. Appendix A provides a narrative account and additional evidence of temporal patterns.

Insert Table 6 about here

Creating value "from the outside in". All Aboard, Buoyant, HuntlerZ, and Print-In-3D launched their beta sites exercising little control over supply-side heterogeneity. They invited or allowed virtually anyone to become a producer, and organized producers' offerings under broad categories of products or services. For instance, HuntlerZ's website archives showed that land owners could initially list rentable land for hunting based on the land's location and type of game available for hunting. Print-In-3D's only prerequisite for participation was 3D printer ownership and willingness to offer 3D printing services. Owners of 3D printers could also list their location. In imposing only few basic requirements to participation, nascent intermediaries viewed early-stage value creation as a function of accumulating as many participants as there were willing regardless of their relevance. Put simply, "playing a numbers' game" was expected to generate evidence (or the illusion) of mass adoption, which could subsequently be leveraged for growth.

To spur large-scale adoption, intermediaries often recruited initial participants by feigning scale. They typically withheld information about the true number of participating producers, and populated the marketplace with relevant offerings available either on other websites or offline. HuntlerZ, for example, used information from Craigslist listings to create profiles for land owners without their consent or knowledge.

> "We'd say "We created this listing for you!" and a lot of people said "Perfect, thanks!" They wanted more exposure. Then they would call us back and say "Hey, this listing is no longer available. Can you take it down?" We never heard "How dare you? How dare you promote my land."" (HuntlerZ founder, personal interview, August 2015)

Similarly, All Aboard's low control of supply heterogeneity was manifested in mass email campaigns for recruiting the first one hundred listings (company archives of emails exchanges with boat owners, March 2015). In a few instances, All Aboard also recruited supply-side participants offline by "visiting marinas or boat shows and talking to people, telling them about the service and offering them to join" (founder interview, August, 2015). In some cases, All

Aboard approached individuals listing their boats for rental on Airbnb (email archives, April 2015) as well as charter companies the founder had met at tradeshows (email archives, Match 2015). Similar to HuntlerZ, All Aboard's recruitment messages highlighted the financial benefits of marketplace participation such as increasing one's income using existing assets (company archives, March-May, 2015).

In addition to exercising low control of supply heterogeneity, the same group of cases concurrently exercised low control of cross-side interactions. They encouraged but did not require participants to determine pricing and delivery terms, deliver post-purchase customer support, and respond directly to consumers' requests. Participants' autonomous interactions were supported through basic search functionality using participants' location and listed prices. In the case of Ship-N-Go and HuntlerZ, money exchanges occurring outside the direct purview of the intermediary (i.e. in cash) also appeared to promote participant autonomy.

By emphasizing the presumable size of their marketplace, the financial benefits of participation as well as participants' freedom to determine key transaction terms independently, all four intermediaries (Aboard, Buoyant, HuntlerZ and Print-in-3D) were able to recruit initial participants on both sides of the marketplace and generate initial transactions. Over time however, this type of laissez-faire governance exposed transacting parties to the risks non-conformity, e.g. damages to rented property, and obstructed growth. In response, intermediaries generally shifted towards high control of at least one aspect of marketplace participation. Specifically, All Aboard's broad recruiting strategies initially generated some traction but yacht owners hesitated to rent their yachts without verifying renters' skipping license. After failed attempts to partner with the Royal Yachting Association and International Yacht Training to secure a channel for such verifications, All Aboard was forced to "manually ask renters to send

their license if the boat providers require[d] it" (All Aboard founder, personal interview, August 2015). Yet, these actions proved insufficient for generating enough transactions. Facing dwindling growth and depleted financial resources, All Aboard eventually ceased operations.

Buoyant, a second marketplace for boat and yacht rentals, saw greater success by exercising high control of cross-side interactions through insurance instruments almost as soon as it launched its website. Its VP of Business development referred to insurance as "a very key part of our business model" (personal interview, July 2015). Covering "boats worth up to $2 million plus an extra $1 million liability insurance" and "anything from scratches and dings to sunk ships and broken docks" (popular press article, June 2013), insurance mitigated the risk that renters would irrevocably damage rented assets. Buoyant's VP explained:

> "The average person doesn't know how to safely operate a boat…The challenge is convincing [boat] owners that Buoyant is safe, that their boat is insured, and that they get to control the entire process" (VP of Business Development, personal interview, July 2015)

In other words, insurance was important in mitigating the ramifications of consumers' inexperience and in encouraging both sides to transact repeatedly within Buoyant's marketplace rather than outside of it. Over time, Buoyant maintained high control of interactions but shifted its approach to governing supply heterogeneity. It introduced a "captain-for-hire" feature in select locations (VP of Business Development, personal interview, July 2015 and website archives, September 6, 2015), followed by a monthly newsletter "looking for awesome owners who want to grow their business and promote their boats and Buoyant in their city" (newsletter archives, April 2016) as well as a "featured owner" newsletter presenting insights and advice from existing boat owners to other boat owners (newsletter archives, May 2016). All these activities suggested a transition from low to balanced control of supply heterogeneity, focusing on showcasing and engaging the most qualified boat owners and on leveraging them to recruit similarly qualified ones.

Print-In-3D also shifted from low to high control over time. It initially adopted a laisser-faire approach to governing supply heterogeneity and cross-side interactions as discussed earlier. But consumer complaints about the quality and fair pricing of 3D printing jobs motivated Print-in-3D to intensify its control of interactions by introducing a new interface and a proprietary algorithm that allowed consumers to upload their 3D files and instantly receive estimated printing costs based on the volume of a 3D printed part. At the same time, it restricted the types of information transacting parties could share directly, and gave a select group of reliable and highly rated 3D printers the opportunity to fulfill incoming orders before making them available to other printers. During this time, Print-In-3D maintained low control of supply heterogeneity as evidenced by its continuous openness to any 3D printer owner willing to list their services. But a few months later, it took control of the matching process by selecting a small group of 3D printers and giving only them the opportunity to fulfill incoming orders. These changes suggested a shift towards high control of interactions—a shift the founder viewed as necessary for both accelerating growth and maintaining acceptable levels of quality of 3D printed parts.

> "We made a really big shift to our model from the approach where anyone can come and find anything and it's completely up to people, to a more managed marketplace model where you come through us. Then through software we control the price. We coordinate it. Then the finished product is delivered to you…This switch was the marking point in our company's trajectory. If we hadn't made that change I think we probably wouldn't exist anymore. Since then, we really started growing fast and with the margins that we needed to have." (Print-In-3D founder, personal interview, December 2015)

HuntlerZ also attempted to shift from low to high control over interactions, although not always successfully. Its initial lack of involvement in cross-side interactions was followed by an attempt to match inbound inquiries to particular producers (i.e. landowners and outfitters). To do so, it distributed a dove hunting guide on Texas hunting laws and regulations in which it solicited hunters' requests for dove hunting opportunities (HuntlerZ company archives, 2015). Although it was able to generate demand from hunters, HuntlerZ "found hesitation from outfitters", attributing this obstacle to lack of trusted relationships between HuntlerZ and outfitters

(HuntlerZ founder, personal interview, Nov. 2015). Eventually, HuntlerZ decided to pursue a different line of business that would become the "marketing arm" for hunting outfitters, managing their marketing activities and back-end operations so as to build trusted relationships with them (founder interview, Nov. 2015). With this decision, HuntlerZ divested virtually all resources from building a peer-to-peer marketplace, but maintained its old website, continued to incur membership revenue, and occasionally ran email marketing campaigns. In doing so, HuntlerZ opted to use its existing membership "as a sandbox to test things" (founder, personal review, February 2016), from which it could learn about the behaviors and preferences of both sides.

Summary. These temporal patterns across almost half of the cases provide evidence of a value creation process that generally shifted from low to high levels of control. This path was initially inclusive of supply-side participants and supportive of transacting parties' autonomy in communicating and determining their transaction terms. Inclusion was also evident in intermediaries' framing of participation benefits in financial terms. Ultimately, inclusion helped create the illusion of scale, whereas support for participant autonomy enabled transacting parties to customize transaction terms and thus create a strong fit between producers' resources and consumers' preferences. However, low control of both supply heterogeneity and cross-side interactions exposed transacting parties to the risks of non-conformity, including poor customer service and damages to their assets. In response, intermediaries typically exercised stricter control over cross-side interactions by regulating the matching process, and by resolving or anticipating conflict (e.g. through insurance). I refer to this path as a process of creating value "from the outside in" because intermediaries initially opened their doors to virtually all types of

participants and transaction outcomes but over time, closed those doors in pursuit of greater levels of participant conformity on both sides of the marketplace.

Creating value "from the inside out". Gear Up, Pi Society, Ship-N-Go, and Spokes followed an alternative path of value creation that favored balancing low and high control on at least one aspect of the marketplace throughout the observation period. These four cases initially exercised low levels of control over cross-side interactions, allowing participants to determine autonomously the terms of their transactions through basic search functionality, direct messaging, and the freedom to determine pricing and customer service terms. Concurrently, they balanced low and high levels of control of supply heterogeneity. They typically focused on recruiting individuals who, at least on the outset, appeared to possess relevant assets, knowledge and skills as well as relevant interests and personal values (high control of supply heterogeneity). At the same time, they allowed all other interested producers to participate within certain parameters (e.g. in certain categories of products or services or in certain locations) even if these prospects did not initially appear to possess the most relevant qualifications, or appeared to espouse particular values (low control of supply heterogeneity). By selecting individuals using a variety of transactional and behavioral criteria, intermediaries aimed at leveraging a core group of qualified producers in subsequent recruitment efforts.

In Gear Up's case, the initial balancing of low and high control of supply heterogeneity manifested in identifying, recruiting and vetting owners of used triathlon gear who were also interested in recycling and minimizing waste. Alignment between bike owners' personal values and Gear Up's desire to minimize waste and unused assets appeared central in co-opting initial participants to assist in growing the marketplace. During an interview, the Gear-Up founder pointed to an individual carrying a reusable water bottle and explained further:

> "That guy is my ideal customer. He's got an REI water bottle. That's a signal to me; that's who I'm targeting. And if I can get him hooked on it, so he tells some other friends of his how he sold his bike or backpack, that's really great." (personal interview, October 2015)

Balancing was also manifested in allowing but quickly eliminating irrelevant listings, rather than tightly controlling ex ante all listing activity.

> "We take a lot of stuff down from the website when people try to come on and sell bikes that they perhaps bought at Walmart. We don't let anything like that sell on our website, so we go pull it down immediately." (Gear Up product manager, personal interview, July 2015).

This initial focus on balanced control of supply heterogeneity was coupled with low control of cross-side interactions. Gear Up allowed transacting parties set their own prices and communicate directly through its website. But in an effort to deliver more benefits to both sides, Gear Up attempted to balance low and high control over interactions by providing sellers with pricing suggestions, and investing in the development of a proprietary payment system. This system would release funds to sellers only after buyers saw the used equipment in person and agreed to complete the transaction.

> "What makes Gear Up a little more interesting than just Craigslist or eBay is a reservation system where I the buyer, decide that I want to buy your bike. I reserve the bike and make a payment to PayPal and I get a code. It's a six-digit code. I then go to check out your bike. I decide after inspecting it that I really like it. I give you that six-digit code which releases the funds to you, and you give me the bike.' (Gear Up developer, personal interview, February 2016)

However, technical challenges and dwindling financial resources forced Gear Up to abandon the development of its proprietary payment system and with it, balanced control of supply heterogeneity. Next, it shifted towards low control of both supply heterogeneity and cross-side interactions. More relaxed controls of supply-side heterogeneity manifested in introductions of additional product categories (e.g. camping gear) and listings of "fake inventory" (Gear Up founder, personal interview, January 2016). The inventory was not bogus but new and available from online retailers. Around this time, Gear Up also stopped verifying participants' identities itself, outsourcing verification to a payment processing partner, who checked "if you have a credit card and a bank account" (Gear Up founder, personal interview,

January 2016). Although transactions increased for approximately two months, Gear Up eventually discovered transaction growth was driven by fraudulent transactions. As a result, its payment processing partner held Gear Up responsible for fraud and stopped processing payments until Gear Up could reimburse it for the total of value of fraudulent transactions. Unable to find a resolution to this issue, Gear Up ceased operations.

Similar to Gear Up, Ship-N-Go also launched with balanced control of supply heterogeneity and low control of cross-side interactions. It invited and allowed anyone willing to offer shipping services but offered drivers the opportunity to obtain a "level 3" driver certification based on background checks. The founder had also created and made available online a thirty-page ebook on how drivers could win bids and behave professionally (website archives, 2014). He also began to maintain a blog with information and advice about best practices in shipping (website archives, 2014). Concurrently, Ship-N-Go supported autonomous interactions by allowing participants to interact freely throughout the lifecycle of the transaction (e.g. negotiate the price of service or complete transactions in cash). Relaxed oversight over interactions was especially obvious in Ship-N-Go's non-contractual conflict resolution process.

> "We have a five-step dispute resolution process…if things were to go wrong then we have a well-defined process in place for people to go through that dispute and try and come up with an amicable resolution…there's nothing contractual for the 5-step process until the very end. Essentially, a lot of it is based on good faith but a lot of it is also based on good communication, assuming that both parties are willing to come to the negotiating table. If you've got some stammer who just joined the site with fake information and who wanted to steal someone's spot, there's not much we can do unfortunately. I mean there are thieves everywhere, you can try and get as smart as you like but thieves are always going to find a way to rob a bank or steal jewelry, or do whatever they want to do. All you can do is, I think, minimize that risk as best as possible." (Ship-N-Go Founder, personal interview, July 2015)

Individuals' inexperience in providing and requesting shipping services combined with little firm involvement in specifying the key terms of their transactions prevented both parties from committing to a transaction. Even though Ship-N-Go recognized this challenge, it chose to maintain balanced control of supply-side heterogeneity but shifted from low to balanced control

of cross-side interactions. Specifically, it introduced pricing recommendations for drivers and budgeting tools for shippers; began showing consumers the fees and taxes they would have to pay before they committed to a transaction; and introduced an escrow service, which required participants to undergo additional identity verification steps. Increased oversight over money flows together with increased influence rather than full control over participants' pricing decisions appeared to balance the costs against the benefits of increased monitoring of interactions. But despite this shift, growth proved disappointing:

> "We've had quite a lot of drivers basically resign from the site because a) they don't like the escrow, they don't like the fact that they can't get their money straight away, that they have to wait two or three days, and b) they are not comfortable giving over their account information." (Ship-N-Go founder, personal interview, November 2014)

In turn, Ship-N-Go maintained transacting parties' freedom in exchanging information and negotiating prices but "became less transparent with pricing" (founder, personal interview, December 2015) by restricting information on service fees until consumers committed to a transaction. This stable focus on balanced control of cross-side interactions was combined with a stable focus on balanced control of interactions (e.g. a bidding system, lack of insurance, and seller-only reviews). Yet, Ship-N-Go continued to experience disappointing growth and thus shifted towards high control of cross-side interactions evidenced by efforts to establish partnerships with a pet transportation provider and with the International Pet and Animal Transportation Association. The latter would enable drivers to earn a pet transportation certification whereas the former would provide access to qualified drivers. Although these partnerships did not come to fruition, Ship-N-Go maintained its commitment to high control of supply heterogeneity by approaching a small but engaged group drivers to whom it wanted to direct incoming shipping requests. The founder explained:

> "My vision for what I want Ship-N-Go to be now is a small number of highly active drivers rather than a large number of drivers winning one contract a week or every two weeks. Really it is as simple as that." (personal interview, July 2015)

Despite these efforts, Ship-N-Go was unable to attract more participants or secure more investment, eventually divesting all resources in early 2016.

Consistent with Gear Up and Ship-N-Go, Spokes also launched with balanced control of supply heterogeneity and low control of interactions. On the supply side, it allowed anyone to create rental listings for bikes, stand-up paddle boards and snowboards from any country or city in the world but focused initial recruitment resources in New York City and San Francisco. Limiting bike owners' participation to two locations and three activities narrowed the geographic and service scope of the marketplace whereas openness to heterogeneous prospects from other locations allowed Spokes to sketch its future growth strategy. At the same time, Spokes initially opted for low control of interactions giving transacting parties the freedom "to make their own decision" (chief marketing officer, personal interview July 2015) and determine pricing; coordinate pick up and drop off locations and times; and assume the risk of damage or theft.

Over time, Spokes continued to exercise balanced control of supply heterogeneity as evidenced by its expansion to three new geographic markets but continued focus on recruiting mostly bicycle owners. To maintain an acceptable level of quality of bicycles for rent and generate additional transactions, Spokes leveraged existing customers and their referrals to recruit additional ones.

> "What we try to do then is focus our offline promotional material around the people who've had completed rentals, as in the bike owners…I try to pick our most likely promoters and then amplify whatever they're going to do instead of trying to target everyone at once (Spokes chief marketing officer, personal interview, July 2015)

Recruiting relevant participants was also accomplished through sponsorships of bike advocacy groups, which operated bike valets at tradeshows and conferences. By providing them with financial resources and personnel, Spokes gained access to individuals who typically chose to rent bikes when traveling to a new destination.

However, as Spokes expanded to new locations and product categories, it inevitably populated its marketplace with more heterogeneous—and thus less likely to conform—producers and consumers. As a result, Spokes shifted from low to balanced control of cross-side interactions. Specifically, it introduced a rental agreement requiring renters to assume the costs associated with potential bike damage or theft. But in the case renters were not able to do so, Spokes promised to reimburse owners for damages up to $5,000 (website archives, March 2014), and a few months later, raised this amount to $10,000 (website archives, December 2014). These activities provided evidence of balancing low and high control of interactions through a combination of ex ante risk mitigation, and discretionary ex post risk mitigation instruments.

Over time, Spokes maintained stable focus on balanced control over supply heterogeneity and cross-side interactions by pursuing new activities. For instance, it designed a "smart bike"—recognized as an award-winning innovation—with which it planned to populate new geographic markets thereby increasing both the number and quality of bikes available for rent (chief marketing officer interview, October 2015). At about the same period, Spokes also introduced optional insurance for renters thereby limiting their exposure to risk if they damaged rented property or third-party property. Spoke's chief marketing officer explained:

> "One thing we just launched is the renter protection. Renters now can actually buy their own insurance. Most times you pay for an insurance but the insurance is liability only. It is not actual property insurance. We obviously guarantee every bike with $10,000, but renters can now buy insurance for themselves for any kind of damage or theft and we cover up to $1000 worth of damages. Depending on the rental period and type of bike, renters get a combination deal that asks the, "Do you just want just liability protection, or just damage property insurance or both? (personal interview, October 2015)

Giving consumers the option to purchase insurance mitigated risk for the demand-side as well and provided additional evidence of Spokes' continued focus on balancing of low and high control of cross-side interactions.

Last but not least, Pi Society also maintained a relatively stable focus on balanced control of at least one and eventually both aspects of marketplace participations. At the beta launch of its

website, it allowed anyone to ask or answer math problems located in South Africa; it offered a book useful for training participants in math; and loosely defined tutors as "anyone who is willing to produce content" (founder, personal interview, August, 2015). Concurrently, Pi Society's website structure and marketing messages appeared to exercise little control of interactions; it simply invited individuals to answer and ask questions, and search content based on grade levels. Over time, Pi Society continued to balance low and high control over supply heterogeneity. For example, its website archives (December 2015) showed it posed few if any restrictions on who could become a tutor, and introduced a variety of content areas available for tutoring including science, technology and engineering (low control of supply heterogeneity). But at the same time, it attempted to recruit teachers from local schools as qualified tutors and partnered with a national public TV station to create tutoring videos with which it could populate its tutoring marketplace. It also attempted to recruit relevant producers by establishing a tutoring association, which would certify tutors and thus create a pipeline of qualified tutors (high control of supply heterogeneity). Although Pi Society maintained balanced control of supply heterogeneity, it shifted from low to balanced control of cross-side interaction. It transitioned from having no involvement in how and when the two sides transacted to matching inbound demand for tutoring with particular tutors. However, slow growth eventually led the founder to pursue a different line of business focused on promoting science education through math and science programs in collaboration with makerspaces. As in the case of HuntlerZ, this shift led Pi Society to divest all resources from building its tutoring marketplace.

Summary. These findings provide evidence of a value creation process that maintained a relatively stable focus on balancing low and high control over one or both aspects of participation in nascent peer-to-peer marketplaces throughout the observation period. This path

began and generally remained selective of producers, recruiting those with relevant resources, interests, and personal values while welcoming all other willing producers despite their qualifications or fit with intermediaries' expectations. Balancing was also manifested in intermediaries' marketing messages, which framed the benefits of marketplace participation in both financial and socially responsible terms. This balancing enabled the creation of a qualified core of producers and concurrently captured inbound interest from additional producers. A relevant core of initial producers likely to behave appropriately seemed to operate as a conduit for supporting and promoting conformity, lessening the need for monitoring. But as participation grew on both sides of the marketplace so did the need to oversee cross-side interactions. I refer to this path as a process of creating value "from the inside out" because of its focus on building a relevant core of producers first while welcoming less relevant ones, and subsequently expanding this core by leveraging relevant producers' accomplishments and voluntary effort to do so. The inevitable participation of both producers and consumers with heterogeneous behaviors eventually motivated stricter, albeit moderate, oversight over cross-side interactions so as to maintain adequate levels of conformity on both sides of the marketplace.

The case of the non-conforming case. Grasshoppers, a peer-to-peer lawn care marketplace, was the only case that followed a very different path to value creation and therefore did not conform to previously described patterns. It exercised high control of both supply heterogeneity and cross-side interactions and did so concurrently and consistently throughout the observation period. On the supply side, it initially hired and trained service providers, and audited the quality of their service. But Grasshoppers' founder quickly concluded that scaling up while pursuing these activities was not feasible without considerable financial resources. As a result, Grasshoppers pursued an alternative set of activities, but with a continued focus on

governing strictly both supply heterogeneity and cross-side interactions. High control of supply heterogeneity manifested in extensive vetting of service providers (e.g. interview questions evaluating their level of expertise) whereas high control of interactions manifested in limiting service to home owners with lots larger than 0.3 acres; specifying service days for particular neighborhoods; and fixing the price of lawn care at $21.99 per lot. Grasshoppers also restricted direct communication between home owners and lawn care providers even when unforeseen circumstances (e.g. a dog in the back yard) prevented the completion of service. Eventually, Grasshoppers was forced to close.

DISCUSSION

Peer-to-peer marketplaces have been foundational to popularizing transactions between individuals and ultimately, to the growth of the sharing economy (Sundararajan, 2016). Although prior research has generated useful insights into how two-sided markets built around technology platforms create value, little systematic research has examined the value creation process in peer-to-peer marketplaces, a particular type of two-sided market in which participants' heterogeneous behaviors and interactions cannot be solely governed by technical specifications and rules.

Evidence from nine peer-to-peer intermediaries suggest value creation is a function of governing participants and their interactions so that they exhibit appropriate and value-adding behaviors. The value creation process in peer-to-peer marketplaces can thus be explained by how intermediaries govern over time two key aspects of marketplace participation: supply-side heterogeneity and cross-side interactions. Emerging patterns suggest that value creation evolves with shifts in intermediaries' level of control of supply-side heterogeneity and cross-side interactions. The sequence in which intermediaries shift control over these key aspects of marketplace participation reveal two alternative value creation processes. Creating value "from

the outside in" initially combines a value creation logic of inclusion, recruiting as many producers as possible regardless of their relevance (low control of supply heterogeneity) with a value creation logic of participant autonomy, allowing transacting parties the freedom to personalize offerings (low control of interactions). Such freedom eventually exposes participants to the risks emanating from their lack of conformity to appropriate behaviors, thereby motivating intermediaries to enforce strict control over one or both aspects of marketplace participation. In contrast, creating value "from the inside out" maintains a relatively stable focus on balancing low and high control. When governing supply heterogeneity, it initially balances inclusion and exclusion value creation logics, recruiting a core group of qualified producers while capturing interest from other, less qualified but willing producers (balanced control of interactions). Over time, intermediaries leverage qualified producers' track record, knowledge and experience to recruit and train additional likely-to-conform producers. But over time, less qualified and more heterogeneous participants inevitably join the marketplace and challenge conformity. In response, intermediaries shift from low to balanced control by integrating their own monitoring efforts with those of participants, overseeing jointly both supply heterogeneity and cross-side interactions.

Unique Value Creation Challenges in Peer-to-Peer Marketplaces

Although these findings show that value creation in peer-to-peer marketplace might follow a different path, the nature of value created in both cases appears concerned with the behaviors of producers and consumers. In addition to overcoming "the celebrated chicken-and-egg problem" of recruiting two interdependent sides of the market (Rochet & Tirole, 2003b: 990), peer-to-peer intermediaries must also manage, in the words of an informant, the "fickleness of humans". The uncertainty surrounding individuals' willingness and ability to exhibit

appropriate behaviors when transacting with one another has been identified as a key challenge in collaborative approaches to consumption including the sharing economy (Benoit et al, 2017). The fact that six out of nine cases participating in this study experienced failure suggests that effectively governing the masses is not a simple feat.

Governing the heterogeneity of individual producers and consumers under conditions of uncertainty about their behaviors involved, in some cases, the balancing of opposing value creation logics (inclusion vs. exclusion and autonomy vs. monitoring). A similar tension has been identified in prior research on technology ecosystems, in which intermediaries must manage a tension between standardization and variety of complements so as to support the consistency as well as novelty of complementors' offerings (Wareham et al, 2014). Peer-to-peer intermediaries face a similar tension albeit one emerging from participants' heterogeneous resource endowments and behaviors, some of which cannot be entirely anticipated ex ante, observed, or fully controlled. The nature of this tension may explain the distinctly different criteria intermediaries use to govern participation such as participants' resources (e.g. assets), interests (e.g. hobbies), personal values (e.g. protecting the environment, honesty, fairness) and behaviors (e.g. use of appropriate language).

Governing marketplace participation using criteria not directly related to the good or service exchanged, but to the individuals transacting with one another suggests trust building in the sharing economy hinges on instilling confidence among strangers about the offering itself and about the people producing or consuming the offering. As "a process situated in time, where the interpretation of the past and expectations of the future bring the trustor to make a lead of faith in the present" (Jagd & Fuglsang, 2016: 92), trust building in peer-to-peer marketplaces may require the pursuit of governance activities that help producers and consumers interpret each

other's past behaviors and form expectations of their future behaviors (Schoorman, Mayer & Davis 1995; Rousseau et al, 1998). As prior research has shown, trust building is certainly enabled but not entirely accomplished by seller reviews (Ba & Pavlou, 2002, Xiong & Liu, 2004). This study casts light on a variety of other trust building strategies drawing on participants' shared interests, values and aspirations.

Developing Business Models for Value Cocreation

This study's findings may also have important implications for the ways in which value is cocreated with customers and other stakeholders. When resources critical for value creation reside outside firm boundaries, and cannot be acquired, fully controlled or even known ex ante (e.g. Amit & Han, 2017; Massa et al, 2016), value cocreation is rife with uncertainty about who the ideal contributors are, and how they should best contribute to value creation. Consistent with prior research on business model evolution (e.g. Andries, Debackere & Van Looy, 2013), findings from this study suggest that such uncertainties may be managed over time through business model experimentation. In peer-to-peer marketplaces, business model experimentation appears intertwined with how intermediaries manage the tradeoff between the scale and quality of participation. On one hand, two-sided marketplaces deliver more value when a critical mass of participants exist on both sides of the marketplaces (Evans, 2003; Rochet & Tirole, 2006). Accelerating growth and reaching critical mass sooner than competitors may also award first movers with a dominant position that is reinforced by network externalities (Lee, Lee & Lee, 2006; Schilling, 2003). On the other hand, the quality of offerings can be a key driver of successful market entry in two-sided markets (e.g. Zhu & Iansiti, 2012). In this study, pursuing scale and pursuing quality in participation manifest as strategic tradeoffs with implications for the speed of marketplace growth. Specifically, creating value "from the outside in" appears to

prioritize scaling up at its initial stage, when all are welcome and autonomous interactions are encouraged. Accelerating growth requires the participation of more heterogeneous producers and consumers and thus tolerance for non-conformity. But the benefit of tolerating and even inviting non-conformity to emerge is that it becomes observable. Intermediaries can thus identify the sources of non-conformity, develop capabilities to manage it more effectively, and enforce stricter controls so that more participants eventually conform to desirable behaviors. Creating value "from the inside out" also acknowledges the importance of accelerating growth but only at a rate that allows the creation and maintenance of appropriate levels of behavioral conformity. Instead of viewing scale and quality as a tradeoff, this path to value creation appears to pursue both by finding ways to integrate opposing value creation logics.

Limitations, Contextual Considerations and Future Research

It is important to note that this study's findings do not make any claims on performance outcomes. The performance of the nine cases in this study could be attributed to a multitude of factors outside the scope of inquiry of this research. Instead, the purpose of this study was to identify common patterns in the value creation process across different contexts, including different industries, geographic locations and types of offerings. The case sampling strategy based on cases in their nascent stages prior to amassing a critical mass of participants, as well as similarities in angel and venture capital funding, and founders' lack of prior experience in building two-sided marketplaces enhances the generalizability of process findings.

Future research may examine the performance implications of different approaches to value creation in peer-to-peer marketplaces and generate new insights about when each one might be more effective (e.g. Brea-Solís et al, 2015). The cases of All Aboard and Buoyant suggest that in the context of renting high-value assets, strict oversight over transacting parties'

interactions may lead to better performance outcomes. Tentative evidence from the case of Buoyant suggests that mandatory insurance may counterbalance the risks of opening up participation to inexperienced renters and motivate participants to transact repeatedly. All Aboard's lack of insurance and difficulties in getting transacting parties to commit to a transaction provides additional support to the idea that strict control in the context of high-valued assets may produce better performance outcomes. Strict controls over supply heterogeneity may also positively impact performance when non-conformity poses significant risk to the safety of living beings or the environment. For example, shipping requests in the Ship-N-Go marketplace often involved the transportation of pets, which could have been partly safeguarded if drivers were required to hold pet transportation certifications. In HuntlerZ's case, requiring hunters to provide references before leasing a particular type of land could have reduced the impact of inexperienced or inconsiderate hunters on wildlife and its habitat. Similar controls may be effective when renting bicycles or other sports equipment, with which consumers could harm themselves or others. But a key insight emerging from this study is that such controls may be resource intensive and thus difficult to implement in the nascent stages of peer-to-peer marketplaces.

Future research may also evaluate the role socially responsible strategies for building peer-to-peer marketplaces play in marketplace growth and performance. For instance, Gear Up and Pi Society sought to enroll "champions" that is, participants with personal values aligned with those of the organization and willing to educate new populations on the social benefits of marketplace participation. Both cases aimed at creating social change either by decreasing waste and underutilization of assets, or using math education as a vehicle for lifting youth out of poverty. Investigating the impact of strategies that appeal to producers' and consumers'

economic and social motivations may generate new insights on strategizing in two-sided markets. Additionally, future research may further explicate the relationship between different types of control, and resource gathering and allocation decisions (e.g. Rindova, Yeow, Martins, & Faraj, 2012). Creating value "from the outside in" appears to focus more attention and resources initially on governing supply-side heterogeneity and later on governing interactions whereas creating value "from the inside out" appears to continuously spread resources on both governance activities. Such resource allocation decisions may prove to influence firm survival under different conditions.

Finally, an important research direction concerns the ethical challenges of marketplace-building strategies. Several cases in this study were not forthcoming to their audiences about the size of their customer base, or the identity of initial producers. Yet, the sharing economy is built on decreasing information asymmetries while increasing transparency (Puschmann & Alt, 2016). Not disclosing these actions may create an "ethical paradox". Intermediaries have an interest in disclosing these actions to reduce information costs and encourage transparency. But they also have an incentive to conceal this information if it deters investors, customers and other resource holders from pledging their support to a nascent marketplace. Investigating how intermediaries and investors manage these ethical paradoxes might generate novel theories of resource acquisition in entrepreneurial firms.

CONCLUSION

Dominant theories of value creation in the multi-sided platform literature do not adequately acknowledge the unique value creation challenges facing peer-to-peer intermediaries or explain how they are overcome. Insights from multiple cases suggest that creating value in peer-to-peer marketplaces hinges on intermediaries' effort to promote, support and monitor

producers' and consumers' conformity to desirable behaviors. To this end, intermediaries exercise control over supply-side heterogeneity and cross-side interactions. Shifts in the degree to which intermediaries govern these key aspects of marketplace participation reveal to two alternative and equifinal processes of value creation in nascent peer-to-peer marketplaces. These findings generate evidence and process theory on value creation in peer-to-peer markets with implications for how business models for value cocreation may evolve.

TABLE 1
Distinctions Between Technology Platforms and Peer-to-Peer Marketplaces

	Technology Platforms	Peer-to-Peer Marketplaces
Focus of intermediary's resource deployment	Configuring ecosystem participants around a technological core	Matching supply-side participants' resources with demand-side participants' needs and preferences
Types of supply-side participants	Firms or specialized professionals	Individuals
Means of supply-side participation	Development of platform-specific complements requiring technical or specialized expertise	Development of products or services requiring use of one's existing assets, and nonspecialized knowledge or skills

TABLE 2
Case Data - Interviews

Intermediary (Pseudonym)	Basis of P2P Transaction	Beta Site Launch	First Interview	Informants	# of Interviews	# of Interview Hours
All Aboard	Asset rental (boats)	03/2015	08/2015	Founder	2	3.5
Buoyant	Asset rental (boats)	03/2013	07/2015	Director of business development	3	1.5
Gear Up	Asset transfer (used sports equipment)	08/2014	06/2014	Founder, board member, product manager, community outreach manager, developer	8	8
Grasshoppers	Services (lawn care)	03/2014	08/2015	Founder	6	12
HuntlerZ	Asset rental (land for hunting)	10/2012	08/2015	Founder, co-founder	4	6
Pi Society	Services (math tutoring)	08/2013	08/2015	Founder	4	5.5
Print-In-3D	Services (3D printing)	02/2013	07/2015	Founder	2	2.5
Ship-N-Go	Services (shipping)	02/2014	03/2015	Founder, investor, advisor	7	9
Spokes	Asset rental (bicycles)	04/2012	07/2015	Chief marketing officer, marketing manager	4	4.5
					40	52.5

TABLE 3
Case Data – Archives and Observations

Intermediary (Pseudonym)	Press Releases	Newsletters	Press Articles	Pitch Decks	Email Updates	Website Archives	Other Data
All Aboard	-	-	19	15	3	40	Mobile app designs, recruitment emails (23)
Buoyant	3	7	154	-	-	99	N/A
Gear Up	-	10	2	2	2	69	Business plan (1), event photo (1), blog posts (8), meeting observation (1)
Grasshoppers	-	-	-	1	4	4	Marketing collateral, meeting observation (1)
HuntlerZ	-	3	-	-	2	70	Lead generation test archive, meeting observation (1)
Pi Society	-	-	4	1	-	17	Video content (100), magazine (1), list of speaking engagements
Print-In-3D	-	-	15	-	-	157	'Community' forum archive, meeting observation (1)
Ship-N-Go	23	-	4	-	-	168	Blog posts (207), e-book (1), messages exchanged between participants (2866), meeting observation (1)
Spokes	15	-	11	-	-	258	Media interviews (2), company survey report (1), messages exchanged between participants (12908), meeting observation (1)
Total	41	20	209	19	11	882	

TABLE 4
Coding Scheme for Analyzing Governance Choices

Intensity of Governance		Governance Activities	Representative Evidence
Low control:	Producers and consumers are given the freedom to participate as they see fit. At the same time, they assume all risk that may emerge from their own inappropriate behaviors.	*Supply-side heterogeneity:* Intermediaries welcome all willing producers regardless of the relevance of their resource endowments, interests or values.	*"We encourage users to provide data on their qualifications and experience" (All Aboard, pitch deck)*
		Cross-side interactions: Intermediaries support producers' and consumers' autonomy in communicating and in determining key transaction terms. Transacting parties assume responsibility of resolving their own disagreements.	*"The owner has full choice over who, when, and what price they rent their boat and allow people to rent" (Buoyant, VP of Business Development interview, Jul. 2015)*
High control:	Producers and consumers are required to adhere to particular rules or norms. At the same time, intermediaries assume all risk that may emerge from participants' inappropriate behaviors.	*Supply-side heterogeneity:* Intermediaries limit supply-side participation to producers with relevant resource endowments, interests and values.	*"One of the most important questions we ask providers is "how long does it take you to service a 10,000 square feet lot?" Based on that question, we can tell if they've done it before. Professionally that is." (Grasshoppers, founder interview, Sept. 2015)*
		Cross-side interactions: Intermediaries heavily control the process and terms under which producers and consumers interact and transact interact. They also assume responsibility of resolving disagreements between transacting parties.	*"We dictate what day we service each neighborhood" (Grasshoppers, founder interview, Dec. 2015)*
Balanced control:	Producers and consumers are given some freedom to participate as they see fit but are also required to adhere to particular rules or norms. At the same time, both intermediaries and participants share the risk that may emerge from participants' inappropriate behaviors.	*Supply-side heterogeneity:* Intermediaries focus recruitment efforts on producers with relevant resource endowments, interest or values but also allow any other willing producers to participate within certain limitations.	*"If we have interest from people outside Austin, we just keep track of where they're coming from and invite them to a future location" (Gear Up, founder interview, Jun. 2014)*
		Cross-side interactions: Intermediaries attempt to influence or and partly determine the process and terms under which producers and consumers interact and transact. They assume responsibility of resolving disagreements only if participants cannot resolve them on their own.	*"If your bike is damaged or stolen during a rental period and the renter is unable to reimburse you for the fair value of your bike, we'll cover the cost up to $5,000" (Spokes website archives, Mar, 2014)*

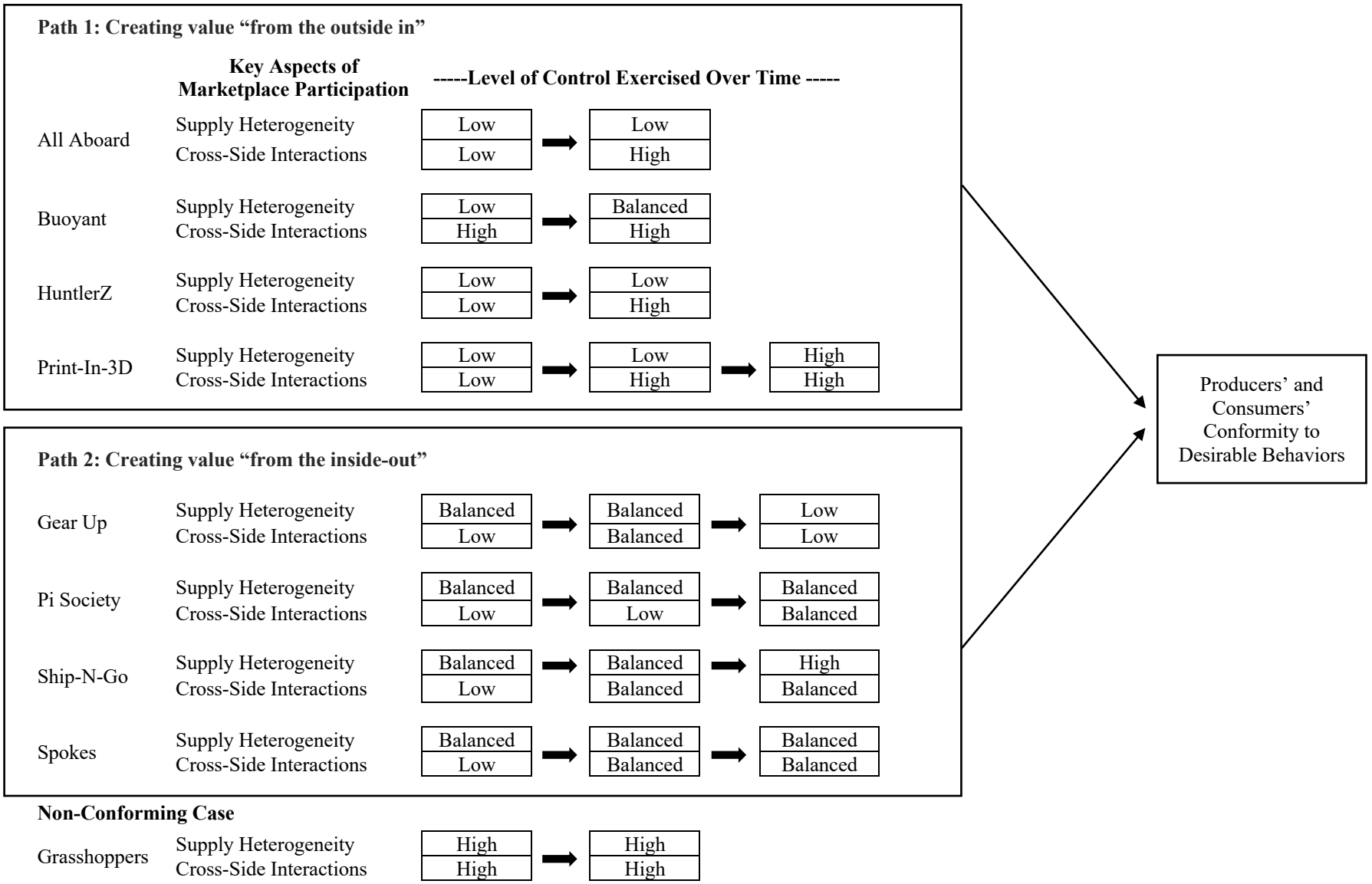
TABLE 5
Value Creation Mechanisms, Underlying Logics and Representative Activities

	Control of Supply-Side Heterogeneity		**Control of Cross-Side Interactions**	
Level of control:	Low	High	Low	High
Value creation logic:	Inclusion	Exclusion	Autonomy	Monitoring
Key activities:	Broad recruitment • Identify and invite prospects primarily online who meet basic criteria for participation (e.g. acceptable type of resources), and highlight the financial benefits of participation Rudimentary verification • Require up to two forms of identity verification (e.g. email verification and/or credit card verification) Broad product/service category or geographic scope • Enable listings of products or services in a variety of categories and in any location	Exclusive recruitment • Recruit prospects primarily offline who meet several criteria for participation (e.g. experience, certification, particular interests or personal values), and emphasize the non-financial benefits of participation Extensive verification • Require multiple forms of identity verification (e.g. email, credit card, driver license, and social media verification) Narrow product/service category or geographic scope • Enable listings of products or services into one or two categories and in one location; monitor listing relevance and eliminate non-relevant listings	Unguided matching • Enable participants' independent search, evaluation and selection of transacting partners based on simple search functionality (e.g. using location and price filters) Unrestricted communication • Support participants' direct exchange of any and all information before and after committing to a transaction Unregulated transaction terms • Support participants' independent determination and negotiation of pricing, customer service, and other key transaction terms • Allow payments outside the purview of the intermediary (e.g. cash payments)	Guided matching • Route incoming consumer requests or orders to qualified producers Restricted communication • Limit direct communication or the types of information participants can exchange throughout the transaction process Regulated transaction terms • Specify and require compliance to particular pricing, customer service, and other key transaction terms • Require payments within the purview of the intermediary (e.g. online payments)

TABLE 5
(Continued)

	Control of Supply-Side Heterogeneity		Control of Cross-Side Interactions	
Level of control:	Low	High	Low	High
Value creation logic:	Inclusion	Exclusion	Autonomy	Monitoring
Key activities:	Broad Reputation Building • Seek or welcome publicity from any interested media outlet Broad Partnering • Target and select partners based on the size of their audience	Targeted Reputation Building • Seek or welcome publicity in selected niche media outlets • Sponsor events during which relevant prospects can be identified Exclusive Partnering • Target and select partners based on their access to relevant audiences	Peer Evaluation • Provide consumers the option to rate and provide feedback to producers publicly Ex-Post Risk Mitigation • Arbitrate disagreements or complaints informally if and when they emerge by helping parties find a commonly-agreed solution	Firm Audits • Audit, evaluate or track quality of service and transacting parties' satisfaction in private Ex-Ante Risk Mitigation • Preempt disagreements or complaints through insurance as well as specify and deliver solutions to disagreements or complaints

TABLE 6
Value Creation Processes in Nascent Peer-to-Peer Marketplaces



APPENDIX A

Evidence of Temporal Patterns

Path 1: Creating value "from the outside in"

All Aboard

Low-Low ➡	**Low-High**
Low Control of SSH • Recruitment of any willing yacht owners and charter companies online and offline; no limitations in geographic or service scope. *"Companies and private persons can list their boats for charter" (Recruitment email, company archives, Oct. 2014)* *"We found our first 150 listings on the internet and we wrote emails to them; we visited marinas; and went to tradeshows" (founder interview, Aug. 2015)* *14 out of 23 email exchanges with prospective customers entailed invitations to joining the website's beta version* *"We encourage users to provide data on their qualifications and experience" (pitch deck, 2015)* Low Control of CSI • Autonomous determination of transaction terms; autonomous evaluation of renters' license; no insurance *"We don't require a license. We manually ask renters to send their license if the boat providers require it"' (founder interview, Aug. 2015)* *"In the first edition of our site, we had a dashboard for owners to enter their prices" (founder interview, Aug. 2015)*	Low Control of SSH: No observed changes High Control of CSI • Manual matching of incoming requests with specific charter companies *"We were trying to find a boat and list it on Anchor to cover the need" (founder description of a forwarded email thread with prospective customer, Feb. 2016)* • (Unsuccessful) attempts to introduce insurance *"I talked to several companies and their response was 'Come on guys. It doesn't make much sense working with you now at such a small scale. As you get more orders, you're welcome to establish a partnership" (founder interview, Feb. 2016)*

APPENDIX A
(Continued)

Buoyant **Low-High ➡**	**Balanced-High**
Low Control of SSH • Few limitations to who can list a boat or where boats are located *"Find and rent a boat directly from our community of boat owners anywhere in the US" (website archive, Apr. 2013)* *"Rent any type of boat, in any location" (website archive, Dec. 2013)* High Control of CSI • Mandatory insurance for every transaction *"Our insurance platform was something first of its kind and obviously a very key part of our business model" (VP of Biz Development interview, July 2015)* *"You [owners] have full control over who you approve to rent your boat, and each rental comes with full comprehensive hull and liability insurance, so sharing your boat is easy and safe." (website archive, Apr. 2013)*	Balanced Control of SSH • Introduction of captain-for-hire feature *"We've seen pretty good response to the beta version of the captain feature and we'll probably roll this out in a test setting this coming fall probably in the south Florida market, since that is the most active year-round market" (VP of Biz Development interview, July 2015)* ***"****Find the perfect boat with or without a captain." (website archive, Sept. 6, 2015)* • Dissemination of advice from boat owners to other owners and introduction of ambassador program *"Featured owner" newsletters (newsletter archives, Apr.-Aug. 2016)* *"We need your help! Become a Buoyant Ambassador" (newsletter archives April 6, 2016)* High Control of CSI • No observed changes to mandatory insurance • Activation of "instant book" feature *"Instant Book is here!" (newsletter archives, Apr. 2016)*

APPENDIX A
(Continued)

HuntlerZ

Low-Low ➡	**Low-High**
Low Control of SSH • Recruitment and openness to the participation of both land owners and outfitters; creation of listings without their consent or knowledge; recruitment through Craigslist and over the phone *"The vision as it stands now is to be the number 1 hunting portal on the web at least here in the US" (founder interview, Aug. 2015* *"Right now, we're connecting hunters with available hunting opportunities, whether it be leases, hunting outfitters or hunting trips." (founder interview, Aug. 2015)* *"We did the Craigslist route where we were just essentially spamming them…Eventually we just started indexing that person's property and phone number on the site. We'd say, "Hey, we created this listing for it." A lot of people were like, "Hey, perfect, thanks." They wanted more exposure. Then they would call us back, like, "Hey, this listing is no longer available. Can you take it down?" We never got, "How dare you? How dare you promote my land." (founder interview, Aug. 2015)* "We made a lot of phone calls too" *(founder interview, Aug. 2015)* Low Control of CSI • No involvement in transactions; membership pricing model *"For the moment, we pass through that lead or that customer to the outfitters" (founder interview, Aug. 2015)* • Lack of ex-ante controls over transacting parties *"At the same time, our site opens up opportunities for scammers and hunters who might cause damage to the property. Usually that's a fleeting objection like "What about this?" Most people I find are well intentioned. You will have the bad apple but that's usually more of a reactive thing that you have to take care of. Luckily we've had 100% success rate so far, but we're looking at ways to both minimize the concern going in and minimize the risk after the fact" (founder interview, Aug. 2015)*	Low Control of SSH: No observed changes High Control of CSI • Solicitation of interest from the demand, and attempts to match inbound interest to appropriate outfitters and land owners. *"We did lead generation and distribution during informational searches during the dove hunting season. We drove a lot leads. But we found hesitation from outfitters" (founder interview, Nov. 2015)* *"The Texas Dove Hunting Guide…Click Here to Find A Place to Go Dove Hunting (Free Service)" (company archives, Sept. 2015)*

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(Continued)

Print-In-3D

Low-Low ➡	**Low-High ➡**	**High-High**
Low Control of SSH • Recruitment and openness to the participation of anyone with a 3D printer; little oversight over, or preference for who participates or from what location *"We launched internationally basically the second week of Print-In-3D" (founder interview, Jul 2015)* *In the beginning, there were all these people posting in Craigslist saying "Hey, I have a 3D printer. I'd love to print stuff for you." We would contact them and say, "Hey, why don't you do this on our site too?...We also made it easy our printers to post to their local sub-Reddits about the services they were offering on Print-In-3D, which would then drag traffic back to Print-In-3D" (founder interview, Jul. 2015)* Low Control of CSI • Autonomous determination of pricing and delivery terms *"You understand and agree that Print-In-3D is not a printing service bureau. Print-In-3D HAS NO CONTROL OF USERS OF THE SITE AND SERVICES AND DISCLAIMS ALL LIABILITY" (Terms of Service document, caps in original document, website archives, May 2013)* • Ex-post risk mitigation *There are definitely times when someone orders a 3D part to be printed and it does not look like what they thought it would look like…We have guidelines [for resolving complaints]. We don't publish them"(founder interview, Jul. 2015)*	Low Control of SSH: No observed changes High Control of CSI • Matching of the two sides by routing incoming orders first to specific 3D-printer owners first and then to everyone else *"More recently, we've have this small group of people we are working with now and sending a lot more orders to. Because in the past, we found that if we have all these printers signed up but one in five of them gets one order a month, then what's the point for them to be on Print-In-3D? Now, we have this small group to whom we're purposely sending $60,000 worth of work a year. Our thinking is that we would rather have a smaller number of people working on Make XYZ full time than 10,000 people who never do anything" (founder interview, Jul. 2015)*	High Control of SSH • Behind-the-scenes partnering with 3D-pritner owners who had consistently proved to be reliable producers *"The list [of preferred printers] grows as our demand grows. But no one is removed unless they are not good producers" (founder interview, Dec. 2015)* High Control of CSI • Automated pricing estimates based on proprietary algorithm *"A couple of months after last July, we made a really big shift to our models from as you know the kind of secure marketplace approach where it's just you come, you could find anyone. Anyone can come and find anything. It's completely up to these people, completely decentralized to this more managed marketplace model where you come through us. Then through software we are controlling the price. We coordinate it. Then the finished product is delivered to you (founder interview, Dec. 2015)*

APPENDIX A
(Continued)

Path 2: Creating value "from the inside out"

Gear Up

Balanced-Low ➡	**Balanced-Balanced ➡**	**Low-Low**
Balanced Control of SSH • Recruitment of small retailers with excess inventory; initial focus on high-end cycle, triathlon and outdoor sports gears; focus on sellers in Austin, TX; sponsoring of bike racing groups, and search for media coverage from niche outlets so as to reach relevant audiences; rudimentary identity verification *"We actually get all of our initial inventory through shops in the area. We go to them and say 'Hey, do you have any old inventory that you're not selling right now that we can post on a discount on our site? Do you have any new inventory you would like to push'?...We want to be the search bar for sports gear new and used; retail, peer-to-peer, all in one place" (founder interview, Jun. 2014)* *"If we have interest from people outside Austin, we just keep track of where they're coming from and invite them to a future location" (founder interview, Jun. 2014)* *"A partnership that was good for us was with Texas Bicycle Racing where we sponsored them and they wrote about us. Niche blogs that have a core but passionate audience are really good. Now, we've started doing partnerships so we go to events a lot and we get a lot of user acquisition through that." (founder interview, Jul. 2015)* *"We ask users for an email and they can log in with Facebook and they can log in with their PayPal account. That's about it upfront, but then we're going to enable them to create a more robust profile in the future" (founder interview, Jul. 2015)* Low Control of CSI • Autonomous determination of pricing and other interaction parameters *"We set a low expectation of who's allowed to interact with our site and everyone else" (founder interview, Jun. 2014)* *"We can tell you what we think you should list it for but it's up to you to do it" (founder interview, Jun. 2014)*	Balanced Control of SSH • New activities with a continued focus on balanced control such as the introduction of concierge service to incentivize more listings and more accurate ones *"The Gear Up Concierge is ready to lend a hand!...and, if you live in the Austin area we'll stop by and help you list items personally!" (newsletter archives, Apr. 2015)* Balanced Control of CSI • Pricing suggestions *"We've been very proactive about going out to people, versus waiting for them to come to us. We keep an eye on everything that goes up on the site. We're very involved in the site. As we grow we'll be automating this down the line" (product manager interview, Jul. 2015)*	Low Control of SSH • Expansion into additional product categories and geographic markets; listings of "fake" inventory; elimination of social identity verifications *"We expanded to Salt Lake City sometimes in August 2015" (founder interview, Jan. 2016)* *Water station in Boulder, CO (company photo archives, Oct. 2015)* *"We faked a bunch of inventory where we listed stuff from other websites that we didn't have, but we listed it below their price, and we claimed it was pre-owned. If it sold, we just bought it." (founder interview, Jan. 2016)* *"We had 5 categories. By the end of the summer we reached a point where we needed to grow. There's not enough inventory if we just put up bikes" (community outreach manager interview, Feb. 2016)* *"We used to have social media verifications for buyers and sellers but we found it was an impediment to signing up…With our payment partner now the main thing you need to have is a credit card and a bank account" (founder interview, Jan. 2016)* Low Control of CSI • Reliance on payment processing partner to vet identities *"We switched from PayPal to Braintree. Braintree is owned by PayPal, but it specializes in what they call aggregated payments, which is the payment system for marketplaces whereas, with PayPal, we had to take their API and write our own payment system" (founder interview, Jul. 2015)* *"People created two accounts on our site, a buyer and a seller using stolen credit card information. They were treating us like an ATM pass through" (founder interview, Jan. 2016)*

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Pi Society

Balanced-Low ➡	**Balanced-Low ➡**	**Balanced-Balanced ➡**
Balanced Control of SSH • Recruitment of participants from South Africa; dissemination of offline, original content; openness to those willing to act as tutors; and provision of financial incentives *"We are focusing on South Africa. We know the problems that are inherent in South Africa. We are going to try and find ways and means of solving those ones by customizing everything to the South African curriculum." (founder interview, Aug. 2015)* *"My book gives tips such as dos and don'ts on how to become successful in maths" (founder interview, Aug. 2015)* *"Tutor is anyone who is willing to produce content that people are willing to pay for, or people are willing to interact with. That's our definition of a tutor. It's a bit loose compared to the traditional definition" (founder interview, Aug. 2015)* *"There was a time I promised to pay $100 to people who would answer a simple question on addition; just a simple addition" (founder interview, Aug. 2015)* Low Control of CSI • Search based on general categories and unrestricted interactions *"On our website, you can register as a freelance tutor for free and learners in your area can contact you for maths lessons. You can post questions and/or answers via the Question and Answer page at no cost" website archives, Jan. 2015)* *Search based on grade level, e.g. grade 1 through 12 (website archives, Dec, 2014)*	Balanced Control of SSH • New activities with a continued focus on balanced control such as the recruitment of South African teachers as Pi Society tutors; introduction of additional categories of STEM topics; creation of educational math videos and newsletters to generate interest from math enthusiasts *"So I started with one school where I went there and asked them to use it…I also did a lot of training with teachers which is a good place to find tutors" (founder interview, Nov. 2015)* *"Science, Technology, Engineering, Art Design, Mathematics" (website archive of home page, Dec. 2015)* *"In these tutorials we help you unleash the mathematical genius in you by showing you key mathematical content and how you can master them for success like a true genius" (company video archives, Nov. 2015)* *"Then I'm building up a database of users that I'll be constantly sending weekly reminders on math principles" (founder interview, Nov. 2015* Low control of CSI: No observed changes	Balanced Control of SSH • New activities with a continued focus on balanced control including attempts to create a tutors' association as a means of creating a pipeline of certified tutors *"The association is already registered and it's going to be fully functional in January 2016 when we're meeting with relevant government officials so that tutors can become licensed" (founder interview, Nov. 2015)* Balanced control of CSI • Revised website where students can find tutors and tutors can pay to be matched with students "*How it works: create profile => post requirement => search tutor => get tutor (website archives, Jan. 2016)* *"There are no lessons posted on here. It's just about finding a tutor. It's a directory basically." (founder interview, Jan. 2016)* *"The tutors paying a fee will be the ones that have an advantage of being discovered as opposed to the ones that are not paying" (founder interview, Jan. 2016)*

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(Continued)

Ship-N-Go

Balanced-Low ➡	**Balanced-Balanced ➡**	**High-Balanced ➡**
Balanced Control of SSH • Background checks for drivers once bids are placed; and dissemination of e-book for drivers on how to win bids and behave professionally *"The drivers had the option of becoming what we call 'level 3' verified…and got this green tick on their profile page… but we didn't execute the background check until the driver actually became active and started bidding on shipments" (founder interview, Jul, 2015)* *"Get in early, make yourself known and set your bid minimum going in" (company e-book archive, 2014)* Low control of CSI • Bidding system for drivers to earn shipping jobs; ratings based on driver reviews; no influence in matching parties; permission to transact in cash; no insurance; firm specific conflict resolution *"What we do is provide that mutual impartial marketplace where one side can fairly demonstrate this is me, this is my service, this is my reputation. Then the consumer can make a decision based on that information" (founder interview, Jul. 2015)* *"Upon completion, the driver gets paid with cash or check" (founder interview, Jul, 2015)* *"We have a five-step dispute resolution process…" (founder interview, Jul. 2015)* *"We haven't quite solved the insurance problem…if we could stick on our side something like 'Insured up to $50,000 or $100,000 or the value of your item', I think that would be huge for us" (founder interview, Aug. 2015)*	Balanced Control of SSH: No observed changes Balanced Control of CSI • Introduction of price recommendations for drivers; bidding parameters controlled by consumers *"We integrated an option for customers when they list their shipment they have the option of being open to all bids, or they have a strict budget in mind" (founder interview, Nov. 2015)* • Introduction of escrow system and additional payment verifications *"We've had the escrow for two or three weeks now. Users have to provide their bank account number and their routing number, and give some additional information. That's a little bit of a step above what we've done in the past, where we just needed generic information like email address and a credit card number" (founder interview, Nov. 2015)* • Search for insurance partners *"Insurance has always been a thorn in my side. I've been putting some effort into trying to find someone…I haven't had any luck yet (founder interview, Nov. 2015)*	High Control of SSH • Focus on developing trusted relationships and enrolling a small group of reliable drivers; pursuit of partnership with pet transportation provider and pet certification association *"I'm actually meeting these drivers and sitting down them down with an iPad, showing the Ship-N-Go platform, and essentially just really trying to engage with them and get them a little bit pumped. I think that face time with someone at Ship-N-Go just makes it a little bit more real for them" (founder interview, Nov. 2015)* *"We're making some good progress with a Dallas based company on being a preferred pet transportation provider" (founder interview, Nov. 2015)* Balanced Control of CSI • Delayed disclosure of fees but otherwise no restrictions on the bidding process *"We decided to become less transparent with the pricing. Customers used to see the cost of the bid and our fee separately which was motivating drivers to conduct the transaction offsite. It was frustrating for us because the drivers didn't pay for that fee! We took out that transparency and it's not until checkout that we add the taxes and fees." (founder interview, Dec. 2015)* *"It becomes very, very, very difficult to eliminate bidding without undermining the drivers. For example, when transporting pet…How big is the pet? Does it have a carry case? Is there more than one pet? How far will it be transported? How long will it take? You have to factor in accommodation for them." (founder interview, Dec. 2015)*

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(Continued)

Spokes

Balanced-Low ➡	**Balanced-Balanced ➡**	**Balanced-Balanced**
Balanced Control of SSH • Openness to anyone willing to list bikes, SUPs and snowboards from anywhere in the world, but focused recruitment on two cities; framing focused on participant similarities as well as financial and non-financial benefits *"Starting on April 1st, 2012, Spoke is the super-cool New York City startup that's launching peer-to-peer bike sharing in both NYC and San Francisco." (media article, Apr. 2012)* *"Users are now able to list skis and snowboards through Spokes, ahead of the early December launch of the snow sports rental platform" (media article, Oct. 2013)* *"Rent a bike/SUP/board from someone like you. Save money, meet awesome people, and consume less" (website archives, Jun. 2014)* Low Control of CSI • Support for participant autonomy in selecting transacting parties combined with several identity verifications and bi-directional reviews; provision of rental tips and FAQs on how to communicate appropriately *"Instead of trying to regulate trust, what we tried to do is to build as many inputs and places possible for people to make their own decision on what they view as trust. That's why we offer the Facebook verification, Twitter verification, mobile verification, user reviews both ways on both the bike and the person" (chief marketing officer interview, Jul.2015)* *"Contact the bike owner...Communicate with the bike owner directly if you would like to change the drop off location" (FAQ website archives, Apr. 2012)* *"Be Friendly. Be Flexible, Be on Time. Send a Message to the Lister. Verify your Account" (website archives, Jan. 2014)*	Balanced Control of SSH • New activities with a continued focus on balanced control such as offline referral generation from existing bike owners; expansion into new geographic markets; and education through personalized recommendations on modifying listings to win more orders; and sponsorships of bike advocacy groups valets to recruit cycling enthusiasts "*I try to pick our most likely promoters…instead of trying to target everyone at once (chief marketing officer interview, Jul.2015)* "*Right now, we have operations in New York, Austin, San Francisco, Portland, and LA" (chief marketing officer interview, Jul.2015))* *"We all spend two to three hours a day emailing batches of users where we say, 'I just looked at your account and saw this. You might want to actually adjust your filtering or the category your bike is in…You'll have better luck here." (chief marketing officer interview, Jul.2015)* *"We sponsored bike advocacy groups…enabling them to broaden the scope of their valets. They still run their valets and do the bike advocacy stuff, which is what we want to support obviously because that helps us. Through that, we get to meet people with their bikes" (chief marketing officer interview, Jul.2015)* Balanced Control of CSI • Introduction of liability insurance protecting owners from damages to their property under certain conditions *"If your bike is damaged or stolen during a rental period and the renter is unable to reimburse you for the fair value of your bike, we'll cover the cost up to $5,000" (website archives, Mar, 2014)* *"…we'll cover the cost up to $10,000" (website archives, Dec. 2014)*	Balanced Control of SSH • New activities with a continued focus on balanced control such as design of a "smart bike" to populate new markets with reliable bicycles for rent "*We won an innovation award by [prominent publication] last month for our bike design. Ultimately our vision is to be the universal key to all of the bikes in the world…Ideally what would happen is we have these smart bikes that we could roll out to every city…Ideally they are owned by people for people so people are actually the ones benefiting" (chief marketing officer interview, Oct. 2015)* Balanced Control of CSI • New activities with a continued focus on balanced control such as introduction of an added 'guarantee' for bike renters up to $1000 "*We are now covering property damage for the renter…if something happens we can step in and you don't get stuck with a huge bill. But we don't offer the insurance until after they've completed their transaction" (chief marketing officer interview, Oct. 2015)*

APPENDIX A
(Continued)

Non-Conforming Case

Grasshoppers

High-High ➡	**High-High**
High Control of SSH • Hiring and training of in-house crew; audits of their quality of service *"We initially trained people up. We had a training program in place for 2 weeks after which they went out and provided services on their own" (founder interview, August. 2015)* *"We tell providers we audit. We let them know up front that, "Hey you're going to have a couple trial days to get to know each other. After that, we're going to go audit what you do to see if you did what you claimed you did. What's the approach we use" (founder interview, Aug. 2015)*	High Control of SSH • New activities with a continued focus on high control through selection of experienced lawn care providers and those willing to get paid per serviced yard rather than hourly *"One of the most important questions we ask providers is "how long does it take you to service a 10,000 square feet lot?" Based on that question, we can tell if they done it before. Professionally. For example, the answer should be between 35-45 minutes…Someone without that experience would say "25 minutes, 15 minutes". We see all of that" (founder interview, Sept. 2015)* *"Now, we're pretty straightforward. We tell providers 'we pay $17 per yard and you get about 4 to 8 yards to mow a day'. We're pretty straightforward and up front about it…this helped us because it filtered out people that may have otherwise been looking for something else." (founder interview, Feb. 2016)*
High Control of CSI • Fixed price of service; exclusion of particular home owners; determination of days of services; restricted communication between home owners and lawn care providers; guaranteed resolution of customer complaints *"$21.99 Mow, Trim, and Blow…We service your neighborhood every Wednesday" (flyer, company archives, 2014)* *"Our price is $22. That's it" (founder interview, Aug. 2015)* "*We have a certain grass height we're willing to cut. That's it. If you're over that grass height, the crew will do it only if they think they can do it" (founder interview, Aug. 2015)* "If there's a dog in the back yard, we email the customer" (founder interview, Aug. 2015) *"If we get customers complains that a provider didn't do this or that, we have that provider come back out the next day to address those issues" (founder interview, Aug. 2015)*	High Control of CSI: No observed changes

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