Discovery, discernment, and exploitation: Entrepreneurial mechanisms at the nexus of individual and opportunity.*

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Research Summary

Extending the opportunity-discovery perspective on Kirznerian entrepreneurship, we propose a general framework in which new businesses emerge from three distinct mechanisms situated at the individual-opportunity nexus: *discovery*, *discernment*, and *exploitation*. We propose observing opportunities in market exchanges and characterizing their profitability potential based on a component that is *common* to all observers and one that is *specific* to individual observers who vary in access to market information. Analysis of an online platform for freelance labor demonstrates our contributions in theory, measurement, and inference. In this context, discovery and exploitation mechanisms shape individuals' entrepreneurial transitions from freelancer to founder. We discuss applications of our framework across settings, extensions to other types of entrepreneurship, and the viability of opportunity as an orienting construct for entrepreneurship research.

Managerial Summary

Entrepreneurial opportunities are present in all markets but there is no systematic way of observing or valuing such opportunities, much less predicting where and when they become the basis for new businesses. We propose doing this with data commonly collected and archived by online platforms. We acknowledge that new businesses are often founded if one is in the right place at the right time; if one can distinguish a great opportunity from a good (or bad) one; or if one is capable of making a market. Our framework makes each of these intuitions empirically distinct, thus offering insights on where, when, and by whom new businesses are likely to be founded. We expect that researchers and companies will apply our approach to online platform data.

Keywords: entrepreneurship, opportunity, founding, information asymmetry, strategy

1. INTRODUCTION

As central as performance differentials are to strategy research (e.g., Rumelt, Shendel, & Teece, 1994) so, too, are opportunities central to entrepreneurship research (e.g., Alvarez, Barney, & Anderson, 2013). Yet, there is persistent disagreement on the merits of "opportunity" as an orienting theoretical construct. Some argue that opportunities are a distinctive feature of the field (e.g., Venkataraman, 1997; Shane, 2000; Shane & Venkataraman, 2000; Alvarez & Barney, 2007, 2020). Others argue that the construct is immeasurable, does not yield substantial insights, and should, therefore, be abandoned (e.g., Foss & Klein, 2020; Davidsson, Recker, & von Briel, 2020). These "opportunity wars" (Wright & Phan, 2020) seem likely to continue until we can observe and measure opportunities, characterize their profitability potential, and accumulate mechanism-specific evidence on how new businesses emerge from the intersection of individuals and opportunities. This manuscript advances these objectives.

We propose a general framework that enables both empirical observation and measurement of entrepreneurial opportunities, yielding theoretical inferences at the individual-opportunity nexus (Venkataraman, 1997; Shane & Venkataraman, 2000). We embrace the opportunity-discovery perspective and focus on Kirznerian opportunities borne of information asymmetry, which implies that opportunities are pervasive but often go undiscovered or unexploited because information is distributed unevenly across people and markets (Kirzner, 1973, 1997; Shane & Venkataraman, 2000; Shane, 2003). Despite its intuitive appeal, empirical research in this theoretical tradition has been limited to small-scale, inductive studies or to contexts that do not readily generalize to other settings (e.g., Shane 2000, Shane & Khurana 2003). Theoretically motivated approaches to observing opportunities independent of their creation (e.g., Alvarez & Barney, 2007) or exploitation (e.g., Foss, Lyngsie, & Zhara, 2013), therefore, promise to inform both entrepreneurship and strategy research.

We elaborate three distinct mechanisms through which individuals' access to information intersects with market opportunity to generate new businesses. We propose distinguishing these

often-confounded mechanisms (see Foss & Klein, 2012, 2015 for discussion) by observing the mundane but frequent instances in which buyers and sellers propose terms of exchange.

Because "exchanges" can be accepted or rejected, both realized *and* unrealized transactions inform observers of opportunities. In this way, we address three key challenges to the opportunity-discovery perspective: (1) observing opportunities independent of new business formation; (2) observing multiple individuals exposed to the same opportunity; and (3) standardizing measures of an opportunity's profitability potential across empirical contexts. Our primary contribution is, therefore, a broadly applicable framework for (a) observing opportunities independent of new business formation and (b) inferring the founding mechanism(s) from such observations.

We further propose delineating an opportunity's profitability potential into one component that is *common* to all exchange observers and another component that is *specific* to individual observers. All who observe buyers and sellers exchanging offers to transact and market prices for realized transactions can infer a founding opportunity's *common* profitability potential. We define this common component as the unit margin implied by the difference between price and input costs, expressed as a percentage of price (e.g., Casson, 1982; Brandenburger & Stuart, 1996). For example, the profitability potential of a service is partially defined by input costs common to all observers (e.g., labor, office space, software) but also partially *specific* to the individual observer because market information is distributed unevenly across observers (Kirzner, 1973). This approach enables comparability across exchanges and is consistent with the belief that "high profit margins increase the likelihood" that an opportunity generates business foundings (Shane, 2003: 138).

We also propose that both differential observation of exchanges *and* differential access to information govern variation in observers' propensities to found a business. First, observing different exchanges will lead two individuals to develop different beliefs about the common profitability potential of founding a business. Second, individuals vary in their access to valuable information on the market. We theorize how information access shapes the opportunities that an

individual *discovers*; how they *discern* an opportunity's profitability potential; and their propensity to *exploit* an opportunity. *Discovery* implies that the likelihood of encountering a high potential opportunity increases with an individual's information access. *Discernment* implies that the propensity to pursue relatively high potential opportunities increases with information access. *Exploitation* implies that the likelihood of pursuing any opportunity increases with information access.

Only three contextual conditions must be satisfied to apply our framework. The first condition is the availability of data on many market exchanges that are observable to both market participants and researchers, independent of whether an entrepreneur founds a new business. The second condition is repeated observation of many individuals, independent of whether they transact or found a business. The third condition, which guarantees the existence of Kirznerian opportunities, is that buyers consider factors beyond price when choosing suppliers (e.g., differentiation on non-price dimensions is a viable strategy).

An online platform for freelance labor satisfies all conditions and, therefore, serves as the context for an initial demonstration of the framework. On this platform, we observe many buyers (i.e., employers) and sellers (i.e., freelancers) exchanging offers to transact (i.e., perform work) and many transactions that imply non-price determinants of buyer choice. We also observe some individual sellers who eventually found agencies that hire others.

We infer the founding opportunity's *common* profitability potential from platform exchanges based on the implied gross margin for the service (i.e., the sales price minus the wage bid of the lowest bidder of satisfactory quality, divided by the sales price). We allow for variance in individuals' expectations of sales volume and market-making costs and, by implication, the opportunity's *specific* potential for each of them. Our empirical analyses indicate that in this context individuals *and* opportunities generate new businesses through discovery and exploitation mechanisms.

By situating the individual-opportunity "nexus" in commonly occurring market exchanges, we contribute a general framework for entrepreneurship and strategy scholars to analyze many

opportunities in other markets and many individuals exposed to the same opportunities, independent of the outcome of interest (i.e., founding). We also offer the first large-scale study of entrepreneurial opportunities and, in doing so, affirm the opportunity construct's intellectual merits for entrepreneurship and strategy research (e.g., Alvarez & Barney, 2020). We discuss how future research might use and enhance our framework in other settings.

2. THEORETICAL DEVELOPMENT

We situate our framework within the opportunity-discovery perspective – as opposed to the opportunity-creation alternative (Alvarez & Barney, 2007, 2010).[1] Informing our framework with prior research, our framework aims to identify the level of analysis most relevant in a focal setting (e.g., opportunity, individual, individual-opportunity nexus). We first characterize opportunities in a manner conducive to standard measurement across markets (e.g., Dimov, 2011). We then consider how individual differences in access to market information accounts for some, but not others, founding a new business (e.g., Folta, Delmar, & Wennberg, 2010; Bennett & Chatterji, 2019).

Building upon prior work, we detail two postulates of the opportunity-discovery perspective, one at the individual level, and one at the opportunity level. We treat these postulates as the received wisdom of prior work that emphasizes the individual or the opportunity. In other words, we establish these postulates as two contrasting positions on what generates entrepreneurship (i.e., individuals or opportunities?) and position our three hypotheses in between these two positions (i.e., at the individual-opportunity level). We then elaborate three mechanisms – discernment, exploitation, and discovery – that motivate distinct hypotheses at the individual-opportunity level. We aim to inform future applications of our framework, allowing for mechanism-specific knowledge to accumulate as the hypotheses are supported or rejected across contexts.

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[1] A separate framework for opportunity-creation would be necessary to examine the implied mechanisms of this perspective (e.g., Zahra, 2008). We encourage the parallel development of such a complementary framework but view this endeavor as beyond the scope of our manuscript.

2.1 The Opportunity Perspective

Grounding our framework in the opportunity-discovery perspective, we first derive a theoretically-motivated, opportunity-level postulate from prior work that anchors one end of the spectrum from individual to opportunity as the genesis of entrepreneurship. An entrepreneurial opportunity exists when a business can be founded to sell a product or service at a price greater than its unit cost (Schumpeter, 1934; Shane & Venkataraman, 2000). Not all are aware of such opportunities, however, because such information is unevenly distributed across market participants (Hayek, 1945; Kirzner, 1973). Otherwise, opportunities disappear as owners of relevant inputs raise prices and/or potential buyers lower their bids (Casson, 1982). A fundamental process for theorizing, then, is the uneven revelation of opportunities to individuals.

Price and cost information is revealed through market exchanges that consist of not only realized transactions but, also, unrealized offers to transact (Fudenberg & Tirole, 1983; Palfrey 1985; Barabba & Zaltman, 1991). By revealing prices and input costs, such exchanges convey information about the potential profitability of an opportunity to found an organization that sells such products or services. In this way, profitability attracts new entrants (Porter, 1980); empirical research documents a positive relationship between entry rates and profitability (Hannan, 1983; Dunne, Roberts, & Samuelson, 1988).

To standardize the opportunity construct across empirical contexts, we use the value creation framework familiar to strategy researchers (Brandenburger & Stuart, 1996) to situate profitability potential at the unit level. This approach is also consistent with strategy scholars' emphasis on profitability, as opposed to profit, in evaluating economic performance and potential (e.g., Rumelt, 1991; Barnett, Greve, & Park, 1994; Markides & Williamson, 1994).

An alternative approach expresses *profit* potential as a measure of total expected profits but we prefer unit *profitability* potential for three reasons. First, this unit margin is unambiguously observable by all exchange participants; volume, and thus total profit potential, cannot be inferred

from a single unit exchange. Second, the percentage figure is more readily comparable across opportunities that vary in price or volume than the total figure is. Third, we believe that total profit expectations vary with an individual's access to the market demand information that informs sales volume expectations. For these reasons, our framework emphasizes profitability potential and *not* profit potential.

We assume that part of the implied profitability potential of founding a business is *common* to all who observe an exchange. Expressing this figure as market price minus input costs per unit, divided by market price (e.g., implied unit margin), we propose that founding rates generally increase with this common value.

Postulate 1 (Opportunity): The greater its implied common profitability potential, the more an opportunity is associated with individual observers founding a business.

Importantly, a lack of empirical support for this postulate does not invalidate application of our framework to a particular context. For example, this postulate will not be supported in settings where entrepreneurship is generated by individual differences or by factors at the individual-opportunity level. Such results do not invalidate the applicability of the postulate in other contexts; they simply direct attention in the focal context to individual differences and/or hypotheses at the "nexus" of individual and opportunity.

2.2 The Individual Perspective

We now derive a similar individual-level postulate from prior work. Individuals' founding propensities vary (e.g., Knight, 1921; Casson, 1995; Cassar, 2010; Elfenbein, Hamilton, & Zenger, 2010). Prior experience, in particular, influences one's propensity to found a business (e.g., Shane, 2000; Parker, 2007; Rider, Thompson, Kacperczyk, & Tåg, 2019), ostensibly through the acquisition of information on opportunities (Agarwal, Audretsch, & Sarkar, 2010; Chatterji, 2009; Campbel, Ganco, Franco, & Agarwal, 2012; Foss & Klein, 2012; Dencker & Gruber, 2015).

Experiences particularly relevant for entrepreneurship facilitate the formation of relationships with those who share valuable market information (Aldrich & Zimmer, 1986; Audia & Rider, 2005; Stuart & Sorenson, 2007). Such information might include a buyer's willingness to pay or repeat purchase intentions (Hoeffler, 2003) or perhaps future sales leads (e.g., Campbell, et al., 2012; Carnahan & Somaya, 2013). We, therefore, treat relationships with customers as important sources of information on opportunities that are distinct from experiences and, unlike relationships, accumulate both within and across buyers.[2] We assume that equally experienced individuals differ in their information access if they transact with different buyers.

Prior work implies that relationships are an important basis for one's "advantage in detecting and developing productive opportunities" (Burt, 2010, p. 5) and that access to information increases with the count of an individual's unique buyer relationships (Burt, 1992; Aldrich & Kenworthy, 1999; McEvily & Zaheer, 1999). This prior work, therefore, implies that buyer relationships constitute an individual-*specific* factor that renders an individual more likely to found a business the more relationships they have with buyers.

Postulate 2 (Individual): The more relationships with market buyers that an individual has, the greater their rate of founding a business.

As above, failure to support this postulate does not invalidate application of our framework. Such results imply prioritizing the analysis of opportunity-level differences and our hypotheses at the "nexus" of individual and opportunity. To reiterate, the purpose of the two postulates is to direct researcher attention to theoretical accounts pitched at the most plausible level of analysis (i.e., individual, opportunity, or individual-opportunity).

2.3 Individual – Opportunity Nexus

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[2] Relationships with suppliers might also provide information on opportunities borne of differential access to inputs. We focus on buyers here with the intent of integrating supply-side considerations in future work.

We now elaborate three theoretical mechanisms -- discernment, exploitation, and discovery -- at the "the nexus of enterprising individuals and valuable opportunities" (Venkataraman, 1997; Shane & Venkataraman, 2000; Eckhardt & Shane, 2003, Shane, 2003).[3] We do so with the intent of addressing critiques of the opportunity-discovery perspective and, more broadly, the value of "opportunity" as a theoretical construct. We emphasize that in any setting it is plausible that all, some, or none of these mechanisms generate new businesses. Repeated applications of the framework will elucidate the conditions under which each is central to the entrepreneurial process.

For the opportunity construct to be useful, one must observe both exploited and unexploited opportunities. But, Foss & Klein (2020, p. 367) note that prior work fails to do so and further contend that observation might be impossible: "Opportunities can at best be manifested *ex post*, when entrepreneurial outcomes are successful." Despite such healthy skepticism, we believe that our approach addresses this important challenge. We contribute a framework that enables one to observe opportunities *ex ante* and to characterize their profitability potentials. We expect that many researchers will welcome our approach to observing and measuring opportunities as well as the mechanism-specific predictions that might or might not be supported across empirical contexts.

Although, in the abstract, every market presents a (singular) opportunity to found a business, entrepreneurs typically found businesses to offer a specific product or service (or a bundle of products and services). Every exchange, then, provides information on the potential profitability of providing one or more specific products or services (i.e., a value-creating unit). So, every exchange offers observers a chance to infer the value of a founding opportunity. Motivated by prior work, our exchange-centered framework specifies three distinct processes operating at the individual-opportunity level.[4]

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[3] We prefer "discernment" to "evaluation" because discernment implies relative assessments of opportunity potential, which we feel is more consistent with Knight's (1921) notion of comparative judgment than the absolute connotations of "evaluation."

[4] Each mechanism invokes a complementarity between an individual's information access and their capabilities (e.g., discovery and search capabilities; discernment and judgment capabilities; exploitation and marketing capabilities).

Prior work broadly implies that individuals differ in their propensities to "discover" opportunities and, once discovered, to "exploit" opportunities (e.g., Kirzner, 1973; Delmar & Shane, 2004; Fiet, 2007; Alvarez, Barney, & Anderson, 2013). Another recurring theme is that individuals vary in their propensity to "discern" the value of a discovered opportunity (e.g., Baron, 2004; Dyer, Gregersen, & Christensen, 2008). To delineate distinct mechanisms at the individual-opportunity nexus, we develop our framework around discernment, exploitation, and discovery mechanisms.

In short, discernment emphasizes how one responds to observed exchanges; exploitation introduces individual-*specificity* to an opportunity's profitability potential; and discovery emphasizes the exchanges that one observes. We first elaborate discernment and exploitation processes that are conditional on observing opportunities before considering the discovery process that leads to such observations.

Discernment Mechanism

First, discernment characterizes a process in which variation in information access renders some individuals likely to judge high potential opportunities as relatively more promising than other ones. This mechanism is motivated by the idea that information access is plausibly as critical to an individual's ability to discern an opportunity's profitability potential as it is to discovering the opportunity (Baron & Ensley, 2006). Discernment implies that not all who observe an opportunity will recognize its profitability potential relative to other opportunities (Knight, 1921; Casson, 1995; Eckhardt & Shane, 2003; Baron, 2004). In other words, some individuals are more likely than others to recognize a good opportunity "when they see it."

Access to market information informs evaluations of not only the absolute potential of a focal opportunity but, also, its potential relative to other opportunities (Von Hippel, 1986; Shane, 2000). For example, Madam C. J. Walker's extensive buyer relationships informed her belief that Black women were underserved by cosmetic and hair care companies in the early 20th Century and that, accordingly, selling products to Black women would be more profitable than selling similar

products to white women (Bundles, 2001)[5]. In this spirit, the discernment mechanism implies that one's sensitivity to high profitability potential opportunities is increasing with access to information via buyer relationships. This logic informs our first testable hypothesis.

Hypothesis 1 (Discernment): The more buyer relationships that one maintains, the more positive the relationship between an opportunity's common profitability potential and their likelihood of founding a business.

Exploitation Mechanism

Second, the exploitation mechanism leverages our critical theoretical distinction between *common* profitability potential at the opportunity level and *specific* profitability potential at the individual level. We cast exploitation as a process in which one's market-making costs are proportional to their information access.

Prior work implies that individuals differ in their costs of "making a market" (Abolafia, 2001), at least in part because they possess different information on buyer willingness to pay and sellers' reservation prices (e.g., Choi & Shepherd, 2004; Hoeffler, 2003). Some individuals have better access than others to information on prices, costs, permits, and, generally, the profitability potential of meeting market demand (e.g., Cromie & Birley, 1992; Uzzi & Gillespie, 2002; Uzzi & Lancaster, 2004).

We characterize variation in opportunity profitability potential as an implied percentage per unit (i.e., a margin) and not a total profit figure (i.e., an amount). Doing so allows for individuals to vary in their access to information on potential sales volume, as opposed to forcing an opportunity's potential scale to be common to all observers. We propose that each individual observer's exploitation costs are proportional to their information access and independent of the discovered or discerned profitability potential of an opportunity.[6] For example, Madam C. J. Walker had many competitors (e.g., Annie Malone, Sarah Spencer Washington) offering similar products but none

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[5] Madam C.J. Walker did create an innovative vegetable-based shampoo, which has aspects of Schumpeterian entrepreneurship. But, she became a millionaire by developing, marketing, and distributing products for textured hair at a time when many customers were not being served by mass producers (i.e., African American women).
[6] Individual-specific, exploitation costs exclude scale-dependent costs like packaging or transportation.

achieved the national scale of her company (Bundles, 2001). If Walker had lower market-making costs than rivals, then the exploitation mechanism accounts (at least in part) for her success.

By providing access to information, buyer relationships reduce one's exploitation costs of making a market (e.g., Abolafia, 2001). Thus, holding constant the implied profitability potential that is *common* to all exchange observers, variation in exploitation costs renders an opportunity's profitability potential *specific* to each individual.[7] Thus, our second hypothesis is that at all levels of common profitability potential the likelihood of founding a business is increasing with the focal individual's buyer relationships.

Hypothesis 2 (Exploitation): At all levels of common profitability potential, the more buyer relationships one maintains the greater their likelihood of founding a business.

Discovery Mechanism

While the discernment and exploitation mechanisms operate upon observation of opportunities, discovery characterizes a process in which information access shapes the exchanges that one observes (e.g., Fiet, 2007). Some individuals are more capable of "discovering" opportunities by being in the right place at the right time (e.g., Yu, 2001). In Kirznerian language, possession of market information is associated with individual "alertness" that enables "discovery."

This insight is consistent with social structure research that stresses how relationships provide access to market information. Burt (2004) theorizes "productive accidents" that result from individuals being "in the right place at the right time" where "place" is defined by one's relationships with others. It is plausible, for example, that some individuals unexpectedly find themselves serving buyers who reveal valuable information on market demand. Prior work on directed search similarly implies that potential entrepreneurs might seek relationships with buyers to acquire market demand

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[7] In essence, the discernment mechanism implies a difference for individuals with high and low access to market information in the slopes of curves depicting their relationships between aggregated common profitability potential and the founding rate. The exploitation mechanism implies only that the rate for high access individuals is greater than for low access individuals at all levels of common profitability potentials (i.e., an intercept difference).

information (e.g., Levinthal & March, 1993; Rosenkopf & Nerkar, 2001; Sarasvathy, Dew, Velamuri, & Venkataraman, 2003; Fiet, 2007; Hsieh, Nickerson, & Zenger, 2007). In short, relationships can position an individual for a fortuitous discovery of entrepreneurial opportunity.

The discovery mechanism implies that some opportunities are associated with high founding rates because individual observes who possess valuable market information are likely to observe such opportunities. The null hypothesis implies that valuable market information does not govern the opportunities that an individual observes (e.g., selection of individuals to opportunities is a random draw). For example, Madam C. J. Walker founded her eponymous company after trialing hair care products with many customers in St. Louis, Denver, Pittsburgh, Harlem, and Indianapolis (Bundles, 2001) – customers who provided extensive information on product effectiveness and willingness to pay for different products. Examples like this imply that the more unique buyer relationships an individual maintains the more profitable will be the exchanges that they observe. This logic motivates our third mechanism-specific hypothesis.

Hypothesis 3 (Discovery): An opportunity's common profitability potential is positively correlated with the number of buyer relationships maintained by the individuals who observe it.

We used the historical example of Madam C.J. Walker to illustrate the intellectual challenge that our framework is designed to address. Inferences drawn from Madam Walker's buyer relationships and her propensity to found her business might be attributable to being in the right place at the right time (i.e., discovery), recognizing high potential opportunities (i.e., discernment), or incurring lower costs of pursuing a given opportunity (i.e., exploitation). As noted above, the difficulty of adjudicating such explanations has motivated prior critiques of the opportunity-discovery perspective and the opportunity construct itself (e.g., Alvarez & Barney, 2020; Foss & Klein, 2020; Davidsson, et al., 2020). Our key contribution, therefore, is a framework that enables researchers to use market exchange data to produce mechanism-specific evidence of what generally leads to the founding of new businesses within a particular context.

3. EMPIRICAL CONTEXT

Our general framework is designed to apply across various markets, but we demonstrate its applicability in a single empirical context. Applications of our framework are generally feasible if three key contextual conditions are satisfied. The first condition is the availability of data on many market exchanges and associated transactions that are observable to both market observers and researchers, independent of whether an individual founds a business. The second condition is repeated observation of many individual observers, independent of whether they transact or found a business. These first two conditions allow for perceptions of founding opportunities to vary across individuals based on both their characteristics *and* the exchanges that they observe. The third condition is that price is not the sole determinant of buyer choice of supplier, so that a strategy of differentiation on non-price dimensions is viable.

These conditions are satisfied by an online labor platform where employers post jobs that require remote laborers to perform tasks like computer programming, graphic design, data entry, etc. (Horton, 2010). First, two types of laborers sell services on this platform: (1) self-employed individuals who perform work and (2) digital agencies that sub-contract work to others.[8] Individuals (i.e., type 1) who operate on the platform occasionally found digital agencies (i.e., type 2), enabling them to bid on jobs and then sub-contract the work to others. Thus, we can observe individuals who found businesses and individuals who are at-risk of doing so but do not. For each agency, the platform provides a precise registration date and the date on which the first sub-contractor is hired.

In light of the definitional debates common to the entrepreneurship literature (see Parker, 2009: 6-15), we explicitly treat freelancing as self-employment and founding a digital agency as entrepreneurship. In this context, self-employed individuals who begin employing others make what

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[8] Digital agencies constitute only 1.5 percent of all platform sellers in our analytical sample but perform approximately 14 percent of platform jobs and account for approximately 15 percent of the platform's total revenue.

is, in our view, a fundamental transition from the labor market's supply side to the demand side. In other words, we observe laborers become founders.

Second, with more than 4,000,000 unique sellers participating in about 200,000 monthly exchanges (i.e., combinations of buyers posting jobs and freelancers posting bids), the platform enables us to observe many individuals exposed to the same exchange as well as the same individual participating in many market exchanges. Thus, we observe many individual sellers independent of whether or not they transact or found a business. Third, only 25.63% of observed transactions in our sample are realized when the buyer selects the supplier that bid the lowest price. Thus, a strategy of differentiation on price-quality ratios or non-price dimensions is viable in this market.

3.1 Data and sample

Given the platform's massive scale, we randomly sample 70,000 self-employed freelancers who joined the platform between January 1, 2013 and June 1, 2014. We then retrieve every exchange that these individuals observed during their first three years on the platform. We exclude from the sample all individuals who enter the market as agency founders because we cannot observe their transition from freelancer to founder. We also exclude individuals who submit only one bid, as they are not exposed to multiple exchanges. We further exclude all exchanges that are negotiated privately or at a fixed price; these exchanges do not convey information on an opportunity's profitability potential (e.g., proposed transactions are unobservable).

These restrictions yield a sample of 32,274 individuals who are at risk of founding a digital agency during our observation period. Of the 802,412 total exchanges observed by these individuals, 255,579 result in a transaction (e.g., the buyer accepts at least one seller's bid) that provides all participants in the exchange information on common profitability potential for an agency founded to provide such services.

3.2 Applying our framework to the platform

We construct context-specific measures of the outcome and explanatory constructs. The dependent variable is a dichotomous measure that indexes an individual's founding of a new agency. Our two independent variables are: (1) the opportunity's common profitability potential implied by platform exchanges and (2) an individual's access to information. We examine interactions between (1) and (2) to test our three mechanism-specific hypotheses at the individual-opportunity level. We also construct an individual-specific common profitability potential measure that allows for individual beliefs of common profitability potential to vary based solely on the exchanges each individual observes. In our context, an individual observes an exchange when they bid, as bidders on an exchange are privy to information on other bidders and eventual transactions.

3.2.1 Individual Outcome Measure: Fundamental Transition

Our outcome of interest measures the individual transition from freelancer to founder of an agency. In our view, this entrepreneurial transition from self-employed and performing tasks such as coding, marketing, or consulting to employing others who perform the same or similar tasks describes a great deal of Kirznerian entrepreneurship in service industries and associated occupations (e.g., lawyers, accountant, investment managers, dentistry, plumbers, electricians). This indicator variable is set to one on the day an independent contractor who is unaffiliated with any other digital agency registers a new agency and employs at least one sub-contractor. Of the 32,274 at-risk individuals in our sample, 208 individuals (0.6 percent) make this fundamental transition from laborer to founder within our three-year observation period.

3.2.2 Exchange Specific Opportunity Measure: Common profitability potential

We first propose a measure of an opportunity's profitability potential that is common to all exchange observers. Let j index each market exchange and i index each individual observer of j. Each exchange is observed by multiple individuals so that each individual, i, observes a value, P_j,

that is common to all observers of exchange j. Here, P_j is simply the difference between the market price p_j and the cost of satisfactory inputs c_j for the focal exchange, expressed as follows:

$$P_j = p_j - c_j \qquad (1)$$

The platform provides us with an excellent measure of c_j, the cost of satisfactory inputs. As detailed in Barach, Kaul, Leung, & Lu, (2019), we measure the cost of satisfactory inputs as the lowest non-winning bid submitted by a platform-recommended bidder. The platform's proprietary algorithm assigns a badge to recommended bidders that enables buyers to infer a focal bidder's anticipated work quality. Given the platform's interest in facilitating satisfactory transactions, we treat this badge as a viable indicator of "satisfactory inputs." In our sample, about 25 percent of bids are posted by recommended bidders and about 71 percent of all job postings have at least one recommended bidder.

In terms of measurement, we treat the lowest non-winning bid price of a platform-recommended individual as the cost of satisfactory inputs, c_j, and the hourly bid of the winning individual as the market price, p_j. Given our interest in characterizing an opportunity's profitability potential in a way that is comparable across units and markets, we treat profitability potential as a unit margin and not a dollar value (Brandenburger & Stuart, 1996). We convert the measure of P_j into a unit gross margin π_j by subtracting c_j from p_j and dividing the difference by p_j to standardize the gross margin as a profitability percentage:

$$\pi_j = \frac{p_j - c_j}{p_j} \qquad (2)$$

For example, in an exchange with a winning bid of $25 and a lowest non-winning bid from a platform-recommended individual of $20, the common profitability potential for this exchange is 20 percent [0.2 = (25 -20)/25)]. We left censor this figure so that all implied negative values equal zero (i.e., no Kirznerian opportunity). In our data, the mean market price for an exchange is $13.76 and

the mean cost of satisfactory inputs is $7.61. Accounting for left censoring, the mean exchange

implies a common profitability potential of 37 percent.

Although non-price differentiation is core to strategic management (Porter, 1980), some

readers might reasonably wonder why buyers do not always hire the freelancer with the lowest bid

(or, more generally, why firms do not always select the lowest cost supplier). In most markets, there

are various reasons that buyers do not choose the lowest price provider: market frictions,

asymmetric information, or heterogenous vertical or horizontal preferences (Baye, Morgan, &

Scholten, 2004). For example, in this market, some employers pay a premium to freelancers they

believe will require less direct supervision (Horton & Johari, 2018) or digital agencies that reduce

buyers' screening costs (Stanton & Thomas, 2016).

Thus, our framework accounts for individuals who observe opportunities to found an

organization that sells a unit at price p_j and then sub-contracts the work to someone else at the cost

c_j, thereby capturing a Kirznerian profit margin, π_j, on the transaction. Two caveats are warranted.

First, our framework does not account for pure arbitrage opportunities because founders are

assumed to incur costs of facilitating such transactions (i.e., exploitation costs). Second, our

framework is not applicable to markets where offerings are undifferentiated or those in which

buyers possess perfect information about price and quality.

3.2.3 Individual-Opportunity Measure: Aggregated common profitability potential

Markets typically consist of multiple exchanges, individuals observe different exchanges, and

an individual can observe multiple exchanges over time. Individuals with equivalent exploitation

costs will consequently develop different beliefs about the value of a founding opportunity based

solely on the exchanges that they observe. We, therefore, express the common component of an

opportunity's profitability potential in a manner that accounts for individuals observing different

exchanges over time. We denote the aggregated *common* value of profitability potential of each

individual as π_{it}, where *i* indexes the individual and *t* indexes the time at which exchanges are

aggregated. Let N_{it} denote the number of exchanges that individual i has observed as of time t, such that the aggregated *common* value of profitability potential of each individual can be calculated as the cumulative average[9] of observed exchanges of individual i at time t:

$$\pi_{it} = \frac{\sum_t \pi_j}{N_{it}} \qquad (3)$$

Importantly, this aggregated common value of profitability potential allows for opportunities to be characterized in a way that is common to all individuals that observe the same set of exchanges and is independent of either their exploitation costs or any one of them founding a business.

The average value of π_{it} aggregated at the individual-day level in our data is 39 percent (5th to 95th percentile range is 15 percent to 61 percent). To simplify interpretation and to reduce sensitivity to a long right-tail distribution, we bin π_{it} by quartiles and report effects relative to the first quartile of cumulative average gross margin, which is all values less than 0.33. The second quartile ranges from 0.33 to 0.39; the third quartile from 0.39 to 0.45; and the fourth quartile contains all values greater than 0.45. Again, this measure indexes the component of opportunity profitability potential that is common to all individuals who observe the same set of exchanges. But, it does not consider individual-specific, exploitation costs that shape potential net margins and, thus, the *specific* component of each opportunity's profitability potential.

3.2.4 Individual Measure: Access to information

We do not propose measuring individual-specific exploitation costs, as these cannot be measured independent of founding and this is likely the case in other settings. Rather, we assume that such costs are decreasing with one's access to information, A_{it}. We accordingly allow an opportunity's profitability potential to be *specific* to each individual observer at the time of observation based on each individual's access to information on a given day, A_{it}. Following each

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[9] Alternative assumptions, such as allowing for recent experiences to weigh more heavily than distant ones, do not substantially alter the reported results. Alternative weighting schemes or measures such as maximum or median profitability might be more appropriate in other settings.

individual's platform-specific work history, we construct A_{it} as the standard network measure of degree – the count of unique relationships that a seller has accumulated, through their job history, to platform buyers. Our identifying assumption is that conditional on equivalent experience, reputation, performance, reservation wage, and other observables, those individuals with more such relationships enjoy greater access to market information (e.g., Uzzi & Gillespie, 2002).

This measurement approach yields substantial variation across individuals in our data: the average observation in our individual-day panel has 6.5 such relationships with buyers but the standard deviation is 13.3, implying that access to information varies substantially across freelancers. To allow for non-linear relationships in our data we coarsen this measure into bins. Because the 25th percentile of this variable is 0 and the median value is 2, we do not coarsen by quartile. Instead, the first bin consists of individuals with no accumulated unique buyer relationships (37 percent of individuals) and the second bin consists of those with only one such relationship (13 percent of individuals). The third and fourth bins are then strictly defined by the 3rd and 4th quartiles of the data (25 percent of individuals in each bin). The third bin consists of individuals with 2 through 6 such relationships and the fourth consists of individuals with at least 7 such relationships.

3.2.5 Control Variables

Because our explanatory measure might be correlated with related individual differences that are not implicated in our hypotheses, we include multiple important control variables in our regression specifications. In consideration of Postulate 1, we define the at-risk pool as all individuals who bid on the exchange because details concerning the exchange are only observable to participants. We control for the scale of the work by using the buyer's estimated number of hours to complete the job, the number of individuals at risk, and the job category of the exchange.

In consideration of Postulate 2 and to test Hypotheses 1 and 2, we create an individual-day panel to conduct relative risk analyses. For these models, we account for an individual's opportunity cost by including the individual's typical wage rate (in USD) listed in their platform profile. We

control for prior experience, in a variety of ways: (i) prior number of bids the individual has submitted, (ii) prior number of jobs worked, (iii) prior platform hourly earnings, (iv) prior platform fixed price earnings; and (v) the tenure on the platform of the individual measured in number of days (and tenure-squared). Some specifications include quarterly at-risk indicators instead of the linear and squared tenure terms.

Distinct from our theoretical interest in access to market information gleaned from relationships with buyers (i.e., relationship breadth), we also control for extent to which each individuals' relationship are concentrated in their most frequent employer (i.e. relational depth) by controlling for the number of jobs performed for the most frequent employer. To account for individual differences in service quality, we include an indicator variable if the individual's accumulated platform rating is (1) or is not (0) in the top decile of all freelancers. To control for breadth of skills (e.g., generalism vs. specialism), we control for the number of job categories in which the focal individual has completed jobs to date as well as an indicator variable for their modal job category. We account for the perceived scale of an opportunity by controlling for the average estimated hours to complete observed jobs.

We believe that, in aggregate, these control variables account for alternative explanations related to an individual's ability, commitment, opportunity costs, and platform reputation, among other factors. We are, therefore, comfortable with our assumption that the number of buyer relationships reasonably proxies for information access.

We test Hypothesis 3 (i.e., discovery) at the bid level. Specifically, we investigate the relationship between individual-level characteristics of bidders and the opportunity-level characteristics of the exchange. For this analysis we us the same controls detailed above.

At the opportunity level, Table 1 presents summary statistics for the 255,579 exchanges in our analyses. Table 2 presents summary statistics and correlations for all variables for the 11.3 million individual-days at risk of agency founding for 32,274 individuals.

4. EMPIRICAL ANALYSIS

4.1 Analysis of Postulates 1 & 2

We first consider the opportunity-level Postulate 1 and then the individual-level Postulate 2, thereby establishing a baseline informed by prior work before conducting hypothesis tests at the individual-opportunity nexus. As we intend for our empirical models to separate individual effects from opportunity effects, we build towards the empirical test of the individual-opportunity nexus by estimating the following Poisson model at the opportunity level:

$$No. Founding_j = \lambda(\beta_0 + \beta_1 \pi_j + X_j \gamma + \epsilon_j) \tag{4}$$

where the unit of observation is the market exchange, j. The outcome of interest is a count of the number of bidders on an exchange that found an organization within three years of that exchange. π_j is the common profitability percentage observed by all bidders to the exchange, and X_j is a vector of exchange-level controls defined in Section 3.2.5.

We then construct a panel at the individual-day level. We run the following piecewise exponential model which investigates the effects of an individual's information access on their relative risk of founding:

$$Founding_{it} = \lambda(\theta_0 + \theta_1 A_{it} + X_{it} \gamma + \epsilon_{it}) \tag{5}$$

the unit of observation is the individual-day for individual i, and day t. The outcome of interest is an indicator which is set equal to 1 on the day the individual founds an organization. A_{it} is a binned measure of an individual's access to information. X_{it} represents a vector of time-varying individual-exchange level control variables detailed in Section 3.2.5.

4.2 Hypothesis 1: Discernment Mechanism

Discernment implies that an individual with greater access to information is more responsive to opportunities with greater aggregated *common* value of profitability potential than an individual with lesser access to information is. In other words, the effect of the *common* component of

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profitability potential, $\pi_{it,}$ on an individual's risk of founding an agency is increasing with an individual's access to market information, A_{it}. To test Hypothesis 1, we continue our analysis of the individual-day level panel data and the following piecewise exponential event hazard model:

$$Founding_{it} = \lambda(\delta_0 + \delta_1\pi_{it} + \delta_2 A_{it} + \delta_3(A_{it} \mathbf{x} \pi_{it}) + \mathbf{X}_{it}\gamma + \epsilon_{it}) \qquad (6)$$

where π_{it} is a binned measure of the aggregated common value of profitability potential and A_{it} is a binned measure of an individual's access to information respectively. $\mathbf{X}_{it}$ is the same set of panel level controls detailed in Section 3.2.5. A positive δ_3 is supportive of the discernment mechanism.

4.3 Hypothesis 2: Exploitation Mechanism

Exploitation implies that when two individuals encounter the same aggregated *common* value of profitability potential, π_{it}, the one with greater acces to information A_{it} will be more likely to found a business. The intuition is that lower exploitation costs render the same opportunity more specifically profitable to individuals with greater information access. To test Hypothesis 2, we propose estimating the model specified in Equation (6) above and treating a positive δ_2 as supportive of the exploitation mechanism.

4.4 Hypothesis 3: Discovery Mechanism

Discovery implies that information access shapes the exchanges that one observes (e.g., Fiet, 2007). Hypothesis 3 accordingly implies that individuals with greater access to information, A_{it}, observe exchanges with higher common profitability, π_j, than do individuals with lesser information access. To test this hypothesis, we propose estimating the following exchange-level model:

$$\pi_j = \psi_0 + \psi_1 A_{it} + \phi_i + \mathbf{X}_{it}\gamma + \epsilon_{ij} \qquad (7)$$

where π_j is the common profitability potential of exchange j, observed by individual i, and A_{it} is the number of unique buyer relationships that individual i has at the time t, when she observes exchange j. The individual fixed effect ϕ_i accounts for time-invariant individual differences and $\mathbf{X}_{it}$ is a set of time-varying individual and exchange level control variables detailed above. The discovery

mechanism implies a positive ψ_1, indicating a positive partial correlation between the profitability of observed exchanges, π_j, and the focal individual's access to information, A_{it}.

5. RESULTS

Postulate 1: Opportunity Effects

Model 1 of Table 3 reports the results of the exchange level analysis proposed in Equation (4). When π_j is in the second quartile, the estimated coefficient is -0.041; however, the standard errors (0.052) are quite large. Therefore, we cannot infer that individuals that observe π_j in the second quartile found organizations at a higher rate than those in the baseline group (i.e., the first quartile of π_j). When π_j is in the third quartile, we observe that bidders in the exchange are 1.14 ($e^{0.128}$) times more likely to found an agency than those in the first quartile baseline group. The standard errors (0.049) around this estimate are significantly smaller than the point estimate.[10] The point estimate, .199, for the fourth quartile imply that bidders that participate in an exchange with π_j in the fourth quartile are 1.22 times more likely to found an agency than bidders that participate in exchanges with π_j in the first quartile. Consistent with Postulate 1, the likelihood of founding an agency is increasing with an exchange's observed common profitability potential.

[INSERT TABLE 3 ABOUT HERE]

We then proceed to the individual-day panel, given that each individual's common profitability potential varies with one's history of observed exchanges. In consideration of Postulate 1, Model 2 of Table 3 summarizes the results of a piecewise exponential model at the individual-day level. The results are consistent with those of Model (1). When π_{it} – the aggregated common value of profitability potential – is in the second quartile, the estimated coefficient is 0.05 which indicates that these individuals are 1.05 ($e^{0.05}$) times more likely to transition than the baseline group (i.e., the

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[10] The 95% CI for the 3rd quartile effect is (.031, .224) which means that we can conclude that the 3rd quartile effect is different from the estimated effect in the 2nd quartile and the 1st quartile, but not from that in the 4th quartile.

first quartile). But, because the standard errors (0.284) around this point estimate are quite large, we cannot infer that those individuals who observe profitability potential in the second quartile are any more likely to found an agency than those in the first quartile. When π_{it} is in the third quartile, however, individuals are about 1.67 ($e^{0.513}$) times more likely to found an agency than those in the first quartile baseline group. The standard errors (0.236) around this estimate are significantly smaller than the point estimate.[11] Large standard errors (0.236) around the point estimate (0.015) for the fourth quartile do not enable us to infer a difference between those in the fourth quartile and those in other quartiles of observed profitability potential.

Postulate 2: Individual Effects

In Model 3 of Table 3, we present results of the model detailed in Equation (5). This model makes use of the individual-day panel to investigate the individual effects of Postulate 2. The results indicate that the founding rate is increasing with one's information access, as indicated by the number of buyer relationships. The results are robust to various bin specifications. Relative to individuals with zero relationships, those with one relationship are about 2.05 times (2.05 = $e^{0.717}$) as likely to found a digital agency [95% CI = (1.34, 3.13)].[12] Even a single buyer relationship meaningfully increases the founding hazard. Relative to individuals with no buyer relationships, individuals with two through six buyer relationships are approximately 4.06 times as likely to found an agency [95% CI = (2.5, 6.6)] and those with seven or more relationships are approximately 3.91 times as likely [95% CI = (2.05, 7.47)]. Together, these results are consistent with Postulate 2: the founding rate increases with one's buyer relationships or, more conceptually, information access.[13]

Joint Consideration of Postulate 1 and Postulate 2

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[11] The 95% CI for the 3rd quartile effect is (0.05, .975) which means that we cannot conclude that the 3rd quartile effect is different from the estimated effect in the 1st quartile.

[12] We exponentiate the coefficients to aid interpretation (e.g., 1.34 = $e^{0.296}$ and 3.13 = $e^{1.14}$)

[13] These results are visually apparent in Figure 1B, which plots Kaplan-Meier curves depicting the founding rate as a function of each individual's buyer relationships (i.e., information access, A_{it}).

In Model 4)of Table 3, we jointly consider Postulates 1 and 2 by including variables for both an individual's access to information and the aggregated common value of profitability potential. More specifically, we re-evaluate the opportunity effects while accounting for variation in individual access to information. We also re-evaluate evidence of individual effects while accounting for the profitability potential of the opportunities that each individual observes.

After controlling for an individual's access to information, A_{it}, the point estimates for π_{it} – the aggregated *common* value of profitability potential change slightly, but the same non-linear positive relationship observed in Model 2 remains. Thus, the positive relationship between opportunity profitability potential and the founding rate is robust to controlling for individual information access. After controlling for π_{it} – the aggregated common value of profitability potential – the point estimates for the A_{it} bins also change slightly, but the positive relationship between an individual's access to information and the founding rate is robust to controlling for the aggregated common value of profitability potential.

Hypotheses 1 and 2: Discernment and Exploitation

Situating our analysis at the nexus of individual and opportunity, we next examine how individual information access interacts with the opportunities that one encounters to influence the founding likelihood.

The discernment mechanism of Hypothesis 1 implies that individuals who vary in information access also vary in their responsiveness to high profitability potential opportunities (i.e., discernment is a function of both π_{it} <u>and</u> A_{it}). The exploitation mechanism of Hypothesis 2, on the other hand, implies that the founding rate is solely a function of A_{it} because exploitation costs, are independent of the opportunities that one observes. To test Hypotheses 1 and 2, we estimate the piecewise exponential event hazard model detailed in Equation (6) above, recalling that support for

Hypothesis 1 implies a positive and significant δ_3 while support for Hypothesis 2 implies a positive and significant δ_2.

In Model 5 of Table 3, the 95 percent CI for all δ_3 interaction terms include zero. Thus, we cannot infer that individuals with higher information access are any more sensitive to high profitability potential opportunities than individuals with lower access are. Hypothesis 1 is, therefore, not supported. We do, however, observe that founding rates are about 3.28 ($e^{1.19}$) times greater for individuals with one prior relationship compared to individuals with no prior relationships. Founding rates are 4.04 ($e^{1.40}$) times greater for individuals with two to six prior relationships and 4.12 ($e^{1.42}$) times greater for individuals with seven or more prior relationships compared to individuals with no prior relationships. These findings support Hypothesis 2. Thus, the results are more consistent with exploitation than discernment.

Hypothesis 3: Discovery

Hypothesis 3 proposes that individuals with great information access are likely to encounter higher profitability potential opportunities. Table 4 reports results from the regression model specified above in Equation (7). Model 1 of Table 4 reports results of a multivariate regression that excludes controls or individual fixed effects. The estimated correlation between an individual's information access and the common profitability potential of the exchanges she observes is approximately zero [95% CI = (-0.003, 0.001)]. Adding individual and exchange controls X_{ij} in Model 2, the correlation between individual information access and the common profitability potential becomes positive but still not significantly different from zero.

In Model 3, we include individual fixed effects in the specification to examine how the partial correlation between information access and common profitability potential is conditional on within-individual changes in accumulated information. We then observe a positive correlation between an individual's information access and the common profitability potential of the exchanges she observes [95% CI = (0.004, 0.051)]. Controlling for time-invariant individual differences, those

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with greater information access observe exchanges that have greater common profitability potential, π_j – supporting Hypothesis 3.

Visual Analysis of Postulates and Hypotheses

We visualize our results in Figure 1. Panel A of Figure 1 plots a binned scatter plot of the linear relationship between the common profitability potential, π_j, of exchanges and the three-year founding rates of exchange participants. Panel B plots Kaplan-Meier curves depicting the founding rate as a function of each individual's buyer relationships (i.e., information access, A_{it}). Panel C of Figure 1 plots the estimated founding rates for high and low information access individuals split by the median number of prior relationships (H_i and L_i) across the observed range of aggregated common profit potential values, π_{it}. The Y-axis indexes estimated hazard ratios obtained from a piecewise exponential model where the baseline rate of 1.0 is for low access to information individuals and exchanges with implied profitability of zero.

Panel C demonstrates that, consistent with Hypothesis 2, the estimated founding rate for H_i individuals is about three times greater at all levels of π_{it} than for L_i individuals. However, inconsistent with Hypothesis 1, the slope is not significantly greater for H_i individuals than for L_i individuals. Finally, Panel D of Figure 1 plot the distributions of encountered exchanges common profitability potential, π_j, for both high and low information access individuals split by the median number of prior relationships (H_i and L_i). The figure shows that high access to information individuals are more likely to discover exchanges with a higher π_j.

[INSERT FIGURE 1 ABOUT HERE]

6. **CONCLUDING DISCUSSION**

Researchers continue to debate the merits of the "opportunity" construct (see Wright & Phan, 2020). Some propose abandoning "opportunities" (e.g., Foss & Klein, 2020; Davidsson, et al.,

2020) while others advocate for continuing, and perhaps greater, influence of the construct on entrepreneurship research (e.g., Alvarez & Barney, 2007, 2020). In this study, we address the primary challenges to the opportunity-discovery perspective and, thus, reaffirm the intellectual promise of "opportunities" for entrepreneurship and strategy research.

By emphasizing the mundane exchanges that constitute markets, our general framework enables researchers to observe and measure opportunities independent of whether an entrepreneur pursues them. Our approach further enables one to infer how individuals and opportunities interact to generate entrepreneurship – through distinct discernment, exploitation and/or discovery mechanisms. So long as researchers can observe many market exchanges and transactions – independent of founding events – they can apply our framework to various empirical contexts (e.g., online platforms). As the primary critique of the opportunity construct is the difficulty of doing just this, our framework constitutes a valuable contribution to entrepreneurship research.

In addition to this theoretically motivated framework, we also offer the first large-scale empirical study of entrepreneurial opportunities. Importantly, we stratify opportunities according to their implied profitability potential and independent of an entrepreneur or a firm pursuing the opportunity. We delineate an opportunity's profitability potential into determinants that are common to all and those that are specific to individual observers. Perhaps more importantly, we do so in a way that is empirically tractable and replicable across empirical contexts.

We demonstrated our approach's utility in an online platform for freelance labor for several reasons. First, platform exchanges enable measurement of key theoretical constructs: founding *opportunities* that vary in their implied profitability potential and *individuals* who differ in their access to market information. Second, price is not the sole determinant of buyer choice on this platform (Stanton & Thomas, 2016).

Third, the setting enables observation of many individuals who encounter the same market exchange but, also, participate in many exchanges. Our empirical analyses reveal both opportunity

and individual influences. At the opportunity level, founding rates increase with the profitability potential commonly implied by a market exchange (i.e., Postulate 1 is supported). At the individual level, the founding rate increases with an individual observer's access to market information via buyers (i.e., Postulate 2 is supported).

Probing mechanisms, we further unpack founding processes at the individual-opportunity nexus. The opportunity profitability potential *discovered* by individuals increases with individual access to information (i.e., Hypothesis 3 is supported). Individuals with greater access to information are also more likely to *exploit* opportunities at all levels of profitability potential (i.e., Hypothesis 2 is supported). Greater information access does not render individuals relatively more responsive to high profitability potential opportunities (i.e., discernment Hypothesis 1 is not supported). We, therefore, infer that discovery and exploitation mechanisms shape entrepreneurs' fundamental transitions from the supply side to the demand side of the labor market.

We treat information access as a function of buyer relationships but, in addition to a presumed correlation with information access, buyer relationships might be correlated with social capital, reputation, or access to capital. So long as information access is difficult (if not impossible) to measure, we will maintain our assumption that access to information is increasing with buyer relationships. We do, however, encourage future research that seeks to develop a direct measure of information access, much as we developed a measure of an opportunity's profitability potential. Future applications of our framework might also subject estimates of the buyer relationship effect on founding to the inclusion of independent measures omitted from our specification.

More generally, our study raises questions about "Why?" some individuals develop greater access to market information than others do. Our platform data provided limited insights into such processes but we expect that future applications of our framework in other contexts might enhance our understanding of how – consistent with the Kirznerian perspective – information is distributed

across individuals within markets. Such efforts will surely enrich our understanding of entrepreneurial opportunity.

To apply this framework in other empirical contexts, only a few analytical requirements must be met. First, exchanges – both realized and unrealized transactions – must be observable to stratify opportunities by their common profitability potential. Second, it is necessary to stratify individuals in their access to market information. Third, one must observe multiple individuals exposed to the same market exchange and individuals exposed to many market exchanges. Last, differentiation on non-price dimensions must be a viable strategy.

Professional services contexts seem promising candidates for applying our approach (e.g., consulting, construction, and trucking). For example, government contracting is an industry where prices, costs, and relationships can be inferred from exchanges that are a matter of public record. Platforms for services as diverse as home repair, dog-walking, financial advice, etc. are similarly promising. Generally, any context in which individuals offer their labor for sale to buyers who bid on their services will be a suitable context so long as the bids are observable and at least some individuals found new organizations to provide such services. It is worth noting that the fundamental transition that we theorize is central to the origins of global services companies such as Arthur Anderson, PWC, and McKinsey & Co.

Researchers might also wish to extend our framework or adapt it to other types of entrepreneurial opportunities. Strategy researchers, for example, might cast information as a resource that generates entrepreneurship when complemented by individual search, judgment, and/or market-making capabilities that map nicely to the discovery, discernment, and exploitation mechanisms. Although we do not invoke firm-level theoretical constructs (e.g., resources and capabilities) to account for individual behavior (i.e., entrepreneurship), we are not opposed to future research in this spirit. For example, exploitation costs might be measurable in other contexts as individual-specific opportunity costs and/or general business formation costs (e.g., Rider, et al.,

2019). Search capabilities might be similarly measurable in contexts that enable observation of individual abilities independent of market activity (e.g., Hegde & Tumlinson, 2020).

Other researchers might wish to adapt our framework to study non-Kirznerian opportunities. For example, using data like ours, one might accommodate the Knightian (1921) or Schumpeterian (1934) perspectives on entrepreneurship by accounting for variation in individual observations of opportunity profitability potential. For example, our Equations (2) and (5) implicate the mean common value of profitability potential in the founding decision. Consistent with Knight's focus on risk and uncertainty, future work might integrate variance in the π_{it} measure. Others might integrate unrealized transactions into the equations to develop a framework inspired by Schumpeter and the contemporary opportunity-creation perspective. Last, diversification scholars will undoubtedly recognize that opportunities to bundle products and services manifest as variety in observed exchanges, implicating a different aggregation procedure than we propose in Equation (2). Recognizing the promise of such work, we formalized the equations in Section 2.4 to facilitate future research on entrepreneurial opportunities.

Finally, in contrast to work that either aggregates self-employment and founding or analyzes one to the exclusion of the other, we provide a general approach to characterizing entrepreneurship. We acknowledge the definitional debate about what constitutes entrepreneurship (e.g., Sørensen & Fasiotto, 2011; Aldrich & Ruef, 2018) but we also see a parallel with the "opportunity wars." Defining entrepreneurship by the outcome (e.g., self-employment, organizational founding) neglects the process that is fundamental to entrepreneurial activity. In our view, both the organizationally employed *and* the self-employed transition from laborer to founder in response to perceived opportunity. We, therefore, urge future researchers to focus on the entrepreneur's *fundamental transition* from the market's supply side to its demand side.

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FIGURE 1: Visual inspection of postulates and hypotheses.
Prima facie evidence consistent with Postulates 1 (P1) and 2 (P2).

A: P1 - Exchange-level founding rate increases with common profitability.
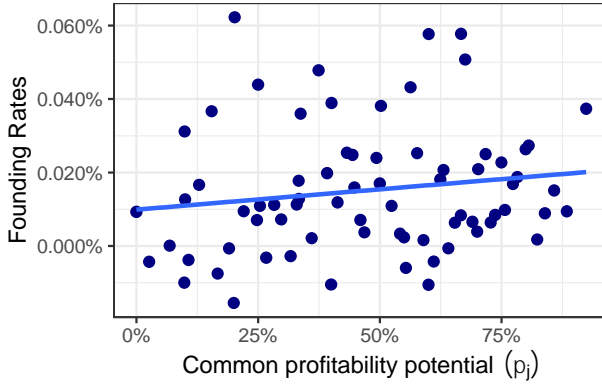
B: P2 – Greater the information access, the higher the founding rate.
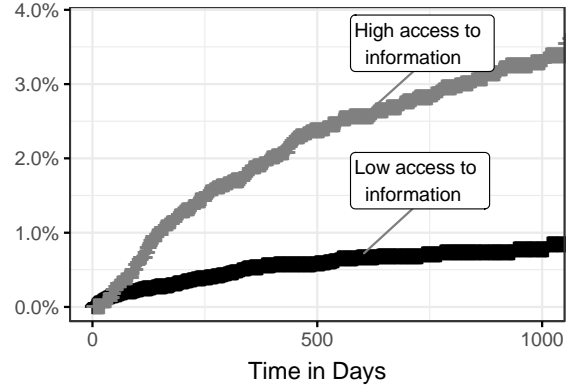
Post-estimation plots of hypothesis test results.

C: Predicted hazard ratios of founding by access to information.
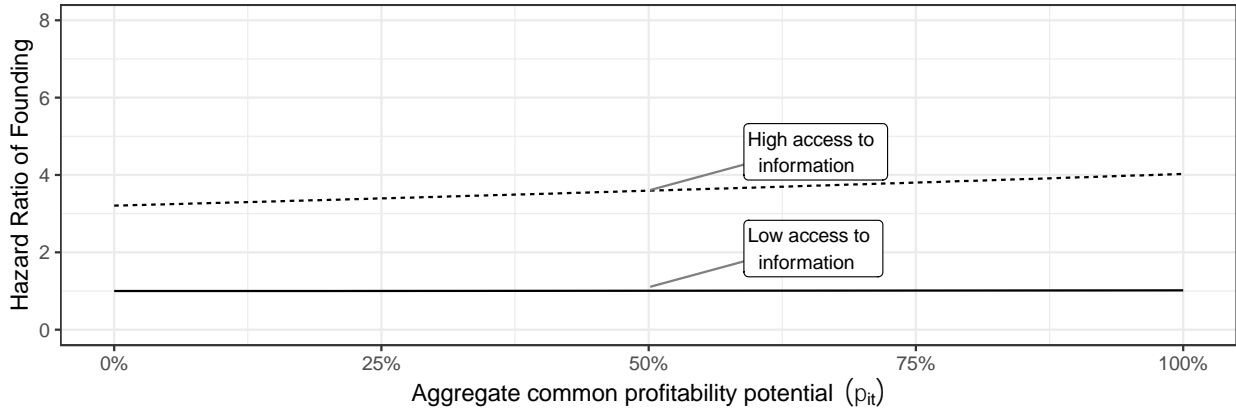
D: Distribution of observed exchange profitability by access to information.
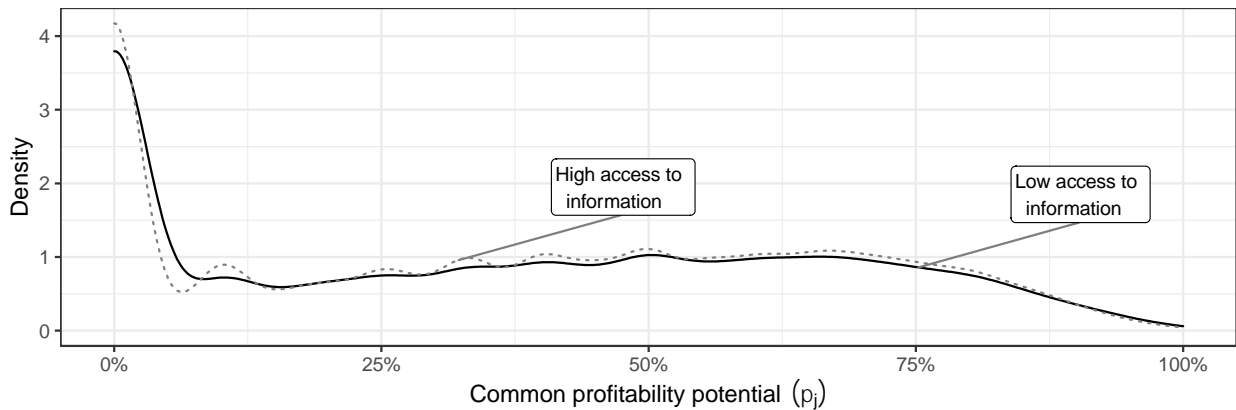
Notes: Panel 'A' depicts a linear relationship between the common profitability potential of the exchange and the percent of at-risk applicants who found an agency within 3 years of experiencing the exchange. Points represent mean founding rates within each bin of width 0.01. Panel 'B' plots Kaplan-Meyer curves of individual transitions by access to information. Panel 'C' plots predicted hazard ratios of transition by below/above median access to information individuals. Panel 'D' plots the distribution of observed common profitability potential by below/above median access to information individuals.

TABLE 1: Opportunity-Level Summary Statistics and Correlations (n = 255,579 exchanges)

	Variable	Mean	Std. Dev.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1)	No. of applicants	52.94	53.91	2.00	1817.00	1.00								
(2)	No. of at risk applicants	41.44	46.14	0.00	1466.00	0.97	1.00							
(3)	No. of hired applicants	1.52	2.54	0.00	358.00	0.00	0.00	1.00						
(4)	Winning bid (p_j)	13.76	16.94	0.00	999.00	-0.11	-0.12	0.00	1.00					
(5)	Low Recomended bid (c_j)	7.61	8.72	0.00	999.00	-0.19	-0.19	0.00	0.26	1.00				
(6)	Profitability potential (π_j)	0.37	0.29	0.00	1.00	0.09	0.08	-0.01	0.42	-0.21	1.00			
(7)	No. transitions	0.02	0.13	0.00	5.00	0.08	0.07	0.01	-0.02	-0.02	0.02	1.00		
(8)	Total cost ($)	1542.96	11581.22	0.00	2871407.50	0.12	0.11	0.00	0.05	0.01	0.06	0.02	1.00	
(9)	Estimated exchange size	333.07	548.33	5.00	2080.00	0.12	0.11	0.00	-0.07	-0.09	0.00	0.05	0.13	1.00

Notes: This table reports summary statistics and correlations of variables at the exchange level. Each exchange is composed of multiple bids which may be accepted or rejected. The sample is restricted to exchanges for which there is both a winning bid and a cost of inputs as is necessary to calculate the implied common profitability potential of founding an organization. The calculated common profitability potentials are left censored so that all implied negative values equal zero.

TABLE 2: Individual Level Summary Statistics and Correlations (n = 11,380,677 individual-days).

	Variable	Mean	Std. Dev.	Min	Max	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	Profitability potential (π_{it})	0.39	0.14	0.00	1.00	1.00											
(2)	Prior employers (A_{it})	6.46	13.25	0.00	274.00	0.02	1.00										
(3)	Avg Est. job size (hours)	462.34	575.51	5.00	4160.00	0.03	-0.07	1.00									
(4)	Prior hourly earnings	2342.47	8648.18	0.00	242182.81	0.10	0.24	0.04	1.00								
(5)	Prior fixed price earnings	390.92	3970.95	0.00	278498.09	0.05	0.43	-0.05	0.27	1.00							
(6)	Profile wage rate	10.16	9.74	0.85	54.00	0.17	0.12	-0.08	0.33	0.24	1.00						
(7)	Relationship depth	0.99	1.88	0.00	68.00	0.00	0.10	-0.01	0.04	0.07	0.00	1.00					
(8)	Prior jobs	8.28	18.24	0.00	583.00	0.02	0.98	-0.08	0.23	0.48	0.13	0.15	1.00				
(9)	Prior bids	302.01	456.51	1.00	6537.00	-0.02	0.57	-0.06	0.18	0.24	-0.06	0.13	0.55	1.00			
(10)	No. Prior categories	9.85	9.22	1.00	53.00	-0.02	0.13	0.03	0.04	-0.01	-0.15	0.05	0.11	0.33	1.00		
(11)	Experience (days)	373.18	306.81	1.00	1095.00	0.01	0.33	-0.01	0.27	0.23	0.09	0.07	0.33	0.34	0.05	1.00	
(12)	Prior feedback	4.63	0.60	1.00	5.00	0.04	0.09	-0.04	0.05	0.08	0.14	0.04	0.10	-0.06	-0.07	0.04	1.00

Notes: Summary statistics are presented for the individual-day panel data. 11,380,677 individual-days of data corresponds to 32,274 at risk individuals and 208 foundings.

TABLE 3: Models of agency founding. Tests of P1, P2, H1, and H2.

	(1) Poisson	(2)		(3)		(4)		(5)	
Estimator	Poisson			Piecewise exponential					
Dependent Variable	*# of Foundings*			*Founding (0/1)*					
Opportunity-level Covariates									
Z(Est. job size)	0.176 (0.014)	0.058	(0.075)	0.019	(0.063)	0.061	(0.074)	0.063	(0.073)
π_j bin									
2nd quartile	-0.041 (0.052)								
3rd quartile	0.128 (0.049)								
4th quartile	0.199 (0.047)								
Individual-level Covariates									
π_{it} bin									
2nd quartile		0.054	(0.284)			-0.051	(0.281)	0.611	(0.559)
3rd quartile		0.513	(0.236)			0.396	(0.235)	-0.105	(0.666)
4th quartile		0.015	(0.236)			0.003	(0.237)	0.349	(0.428)
A_{it} bin									
1 relationship				0.717	(0.214)	0.818	(0.262)	1.189	(0.425)
2-7 relationships				1.402	(0.248)	1.357	(0.298)	1.395	(0.523)
7+ relationships				1.365	(0.329)	1.241	(0.366)	1.415	(0.625)
Z(Relationship depth)		0.093	(0.032)	0.057	(0.041)	0.063	(0.042)	0.067	(0.042)
Z(Prior jobs)		0.165	(0.125)	0.029	(0.194)	0.049	(0.193)	0.071	(0.198)
Z(Prior bids)		0.048	(0.122)	0.012	(0.132)	-0.005	(0.136)	-0.002	(0.135)
Z(Profile wage rate)		0.132	(0.070)	0.106	(0.061)	0.117	(0.075)	0.118	(0.075)
Z(Prior hourly earnings)		0.096	(0.045)	0.054	(0.053)	0.053	(0.053)	0.042	(0.053)
Z(Prior fixed price earnings)		-0.146	(0.147)	-0.054	(0.212)	-0.057	(0.191)	-0.080	(0.196)
Top rated feedback		0.350	(0.198)	0.061	(0.196)	-0.044	(0.213)	-0.037	(0.216)
Z(Num. prior work categories)		0.058	(0.009)	0.051	(0.009)	0.048	(0.010)	0.048	(0.010)
Individual-Opportunity Covariates									
π_{it} bin x A_{it} bin									
Q2 **x** 1 relationship								-0.712	(0.751)
Q2 **x** 2-7 relationships								-0.432	(0.740)
Q2 **x** 7+ relationships								-1.384	(0.882)
Q3 **x** 1 relationship								0.157	(0.821)
Q3 **x** 2-7 relationships								0.644	(0.804)
Q3 **x** 7+ relationships								0.692	(0.840)
Q4 **x** 1 relationship								-0.790	(0.617)
Q4 **x** 2-7 relationships								-0.265	(0.640)
Q4 **x** 7+ relationships								-0.340	(0.732)

Constant	-4.707 (0.094)	-11.495 (0.678)	-10.951 (0.464)	-11.730 (0.671)	-11.884 (0.729)
Sample	Exchange-level	Individual-day panel	Individual-day panel	Individual-day panel	Individual-day panel
Exchange Category FE	YES	YES	YES	YES	YES
Quarter at risk FE	N/A	YES	YES	YES	YES
n(transitions)	N/A	138	192	138	138
n(individuals)	N/A	19890	31630	19890	19890
N or Days at risk	249064	7127033	9728195	7127033	7127033
Log Likelihood	-18922.996	-814.235	-1196.674	-801.563	-797.493

Notes: Model 1 is a Poisson model estimated at the exchange-level. The model includes an offset for the log(number of at risk applicants to an exchange) to control for the number of individuals exposed to each exchange. All non-binned variables are expressed as z-scores. In Model 1 heteroskedasticity-robust standard errors are reported. Models 2-5 are piecewise exponential models estimated on a panel of individual-days. In Models 2-5 the heteroskedasticity-robust standard errors in parentheses are estimated by clustering observations by individual.

TABLE 4: Bid-level analysis of observed common profitability potential. Test of H3.

Dependent Variable	(1)	(2)	(3)	
	Common Profitability Potential (π_j)			
Access to information A_{it} (z-score)	-0.001 (0.001)	0.007 (0.005)	0.028	(0.012)
Z(Relationship depth)		0.001 (0.002)	0.001	(0.004)
Z(Prior jobs worked)		-0.003 (0.005)	-0.025	(0.013)
Z(Prior bids)		-0.004 (0.002)	-0.009	(0.003)
Z(Profile wage rate)		0.017 (0.001)	0.009	(0.002)
Z(Prior hourly earnings)		0.012 (0.002)	0.013	(0.002)
Z(Prior fixed price earnings)		0.005 (0.003)	0.014	(0.005)
Top rated feedback (Y/N)		0.004 (0.002)	-0.003	(0.003)
Z(No. prior categories worked)		0.002 (0.001)	0.006	(0.001)
Exchange category:				
Admin Support		-0.040 (0.004)	-0.041	(0.004)
Customer Service		-0.008 (0.005)	-0.001	(0.006)
Data Science & Analytics		-0.009 (0.009)	-0.006	(0.009)
Design & Creative		-0.028 (0.004)	-0.023	(0.005)
Engineering & Architecture		-0.054 (0.006)	-0.045	(0.009)
IT & Networking		-0.019 (0.005)	-0.032	(0.007)
Legal		-0.018 (0.021)	-0.032	(0.019)
Sales & Marketing		-0.013 (0.004)	-0.017	(0.005)
Translation		-0.008 (0.007)	0.004	(0.007)
Web, Mobile & Software Dev		-0.025 (0.004)	-0.026	(0.005)
Writing		-0.010 (0.005)	-0.034	(0.005)
Z(Exchange size in hours)		0.006 (0.001)	0.003	(0.001)

Z(Experience in days)			-0.046 (0.003)	-0.052	(0.005)
Z(Experience^2)			0.020 (0.003)	0.019	(0.004)
Constant	0.389	(0.001)	0.422 (0.004)	0.426	(0.004)
Observations		590609	546983	546983	
Pseudo R^2		0.000	0.012	0.005	
Individual FE		NO	NO	YES	

Notes: Observations are at the bid level. All models are OLS where the outcome of interest is the implied profitability of an opportunity indicated by a market exchange. The DV is an individual's (bidders) access to information indicated by the number of relationships an individual has with buyers. All covariates are expressed as z-scores. Heteroskedastic robust standard errors cluster by individual are reported in parentheses.