EXPLORING THE TENSION BETWEEN STRATEGIC RESOURCE CHARACTERISTICS: EVIDENCE FROM INDIAN SLUM HOUSEHOLDS

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Abstract

Resource-based theory has identified strategic resources based on the presence of characteristics which include value, rarity, inimitability, and non-substitutability. Each dimension has largely been treated as dichotomous and independent. As a result, Resource-based theory has failed to account for the continuous and interrelated nature of resource characteristics. We advance theory based on the degree of specific resource characteristics and reveal tensions between them. Specifically, we examine how the level of resource inimitability can negatively impact the value of strategic human capital. We test our findings in the under-researched impoverished firm context using a unique sample of Indian slum households and firms.

Introduction

According to resource-based theory (RBT), firms which possess bundles of resources that are valuable, rare, inimitable and non-substitutable (VRIN) will enjoy sustained competitive advantages and, consequently, superior firm performance (Barney, 1991; Wernerfelt, 1984). Theoretical development and testing of resource-based theory have largely characterized each of these resource dimensions as dichotomous (see Newbert, 2007 for a review). As a result, firm resources are classified as valuable or not, rare or not, inimitable or not, and non-substitutable or not. Firms with resources which possess all four qualities are considered to be capable of generating rents, appropriating those rents through isolating mechanisms and subsequently sustaining competitive advantage (Barney, 1991; Crook, Ketchen Jr., Combs, & Todd, 2008).

While this approach has yielded a wealth of insights into the antecedents of firm performance, we argue that it is limited in two ways. First, it fails to account for the continuous nature of resource characteristics. In practice, each resource has a level of value, depending on the extent to which it contributes to the efficiency or effectiveness of the firm; a level of rarity depending on its scarcity within the environment; a level of inimitability depending on the extent to which competitors can copy the resource; and a level of non-substitutability depending the ability of competitors to use different resources to implement the same strategies. Second, current RBT fails to account for relationships between resource characteristics. Disregarding the magnitude of resource characteristics limits understanding of how changes in the level of one resource characteristic may influence the level of another. Prior research has generally portrayed resource dimensions as orthogonal. For instance, the value of a resource is independent of its rarity (e.g. Crook et al., 2008). However, rare resources, such as a new technology, may allow a firm to offer more...
efficient strategies than competitors, thus increasing the resource value (Tushman & Anderson, 1986). Alternatively, adoption of a very rare new technology may be wrought with uncertainty which increases operating costs and decreases resource value (Liebermann & Montgomery, 1988). RBT is largely silent on such tensions between resource characteristics. We seek to address them in this paper.

We argue that treating resource characteristics as continuous is not only more reflective of reality, but also allows for new theorizing regarding the relationship between resource characteristics. While resources with VRIN characteristics are clearly useful for predicting superior firm performance (Barney, Wright, & Ketchen Jr., 2001), the nature of the relationship to performance is not always straightforward (Coff, 1999). As Sirmon, Hitt and Ireland (2007: 273) recently noted, “…merely possessing such resources does not guarantee the development of competitive advantages or the creation of value (Barney & Arikan, 2001; Priem & Butler, 2001). To realize value creation, firms must accumulate, combine, and exploit resources (Grant, 1991; Sirmon & Hitt, 2003).” We build on this insight by proposing that high levels of certain VRIN characteristics may actually limit the firm’s ability to create and appropriate value from its strategic resources.

We demonstrate these effects by examining the strategic resource of human capital in the under-researched setting of informal firms (Webb et al., 2009). Utilizing unique household and firm level data from Indian slums, we demonstrate how tensions between the resource value and inimitability arise. Specifically, we show that higher levels of value and inimitability do not correspond to higher firm performance. Instead, a moderate level of each circumvents tensions between the characteristics, resulting in optimal performance.

**Theoretical Foundations**

**Resource-Based Theory and Resource Characteristics**

RBT argues that strategic resources are those which are valuable, rare, inimitable and non-substitutable (VRIN)\(^2\). Valuable resources allow firms to implement more efficient strategies and rarity denotes that other firms do not have access to the same resources. Inimitability and non-substitutability ensure that advantages provided by strategic resources can be sustained across time. Inimitability arises from social complexity, causal ambiguity or time compression diseconomies (Dierickx & Cool, 1989) and ensures that competitors cannot copy a firm’s resource base. Non-substitutability prevents other firms from implementing the same rent-generating strategies using different but strategically equivalent resources (Barney, 1991). Thus value and rarity of resources allows firms to create new economic rent, while inimitability and non-substitutability provide the isolating mechanisms which lock-in rents associated with those resources (Barney, 1991; Peteraf, 1993; Rumelt, 1984). We suggest that prior RBT theorizing and testing has made two assumptions which do not necessarily reflect practice.

First, RBT characteristics have largely been treated as dichotomous indicators of resources. Either an entire resource bundle is considered VRIN (or not) or individual resource characteristics are considered separately as valuable (or not), rare (or not), inimitable (or not) and non-substitutable (or not). Such an approach, however, ignores the extent to which resources meet each of these characteristics (Newbert, 2008). That is, a dichotomous approach does not capture the de-
to which resources meet each of these criteria. Second, extant literature in RBT has assumed that resource characteristics are largely orthogonal (i.e. have effects independent of each other). For instance, in a recent meta-analysis testing the central tenets of RBT, Crook and colleagues (2008) coded resources according to whether a given resource used in a study met each of these four criteria independently. If any relationship is considered between resource characteristics, it is assumed to be positive (i.e. the value of a resource will increase if it is also considered inimitable) since resources are considered most valuable when they meet all four criteria at the same time (Newbert, 2008). However, we challenge the notion that resource characteristics are independent of each other by exploring conflicting relationship between them.

A RBT Perspective on Human Capital Breadth

RBT posits that firms which possess bundles of resources which are valuable, rare, inimitable and non-substitutable will enjoy sustained competitive advantages and consequently, superior firm performance (Barney, 1991; Wernerfelt, 1984). We use the Penrosian concept of a bundle of productive services as our resource-level of analysis and RBT’s VRIN resource characteristics to evaluate the human resource bundle embedded within firms. A human capital bundle is the collection of knowledge, experience, perspectives and skills available for productive use by a focal firm (Becker, 1964; Penrose, 1959). Human capital is a critical strategic resource (Hitt, Biermant, Shimizu, & Kochhar, 2001) which has been linked to organizational development (Becker, 1964), growth (Penrose, 1959), survival (Pennings, Lee, & van Witteloostuijn, 1998), and sustainable competitive advantages (Hatch & Dyer, 2004). The importance of human capital is further magnified due to its provision of access to other critical resources such as financial capital, physical capital and social capital (Collins & Clark, 2003; Mosey and Wright, 2007). For these reasons, extant RBT studies have demonstrated that human capital is one of the most important and commonly studied strategic resources of a firm (Newbert, 2007).

In doing so, previous research has generally made the argument that strategic human capital represents a VRIN resource and thus should lead to superior performance (Barney & Wright, 1998; Hitt et al., 2001; Sirmon and Hitt, 2001). However, we avoid this dichotomous approach to RBT and rather theoretically treat resource characteristics as continuous and interrelated. Specifically, we focus on two of these resource characteristics and examine the impact of, and tensions between, the degree of value and inimitability. In order to do this, we draw on research examining group-level resource bundles (Haynes & Hillman, 2010) and explore the impact of human capital breadth and depth. Breadth and depth are group-level concepts (Haynes & Hillman, 2010) and thus can be applied to many different types of groups including a board of directors, top management team, ownership group, business family group or founder team. We develop our arguments to be broadly applicable to different types of business groups by focusing on the bundle of human capital resources (Penrose, 1959).

Breadth refers to the heterogeneity of human capital. We specifically examine three factors of human capital diversity to produce the breadth construct – business expertise diversity, educational diversity, and age diversity. Breadth is therefore a measure of the diversity of perspectives, knowledge, advice, counsel, and experience that may be offered. Conceptually, breadth should increase both the inimitability and value of a human capital resource bundle. According to Barney (1991: 106), “Resources are considered valuable when they enable a firm to conceive of or implement strategies that improve its efficiency and effectiveness.” The value of a diverse human
capital resource profile stems from access to a broader knowledge base and varied set of cognitive perspectives (Hambrick, Cho, & Chen, 1996). A higher level of knowledge increases managers’ capacity to reconfigure resources in novel ways to exploit growth opportunities (Penrose, 1959). Diversity of knowledge also expands the conceivable strategic options of the firm. As a result, human capital breadth allows firms to avoid homogeneity of thought and action in strategic decision making. The break from groupthink enables critical strategic change (Haynes & Hillman, 2010).

In their original articulation of board capital breadth from which we draw, Haynes and Hillman (2010: 1148) indicate that, “Conceptually, board capital breadth builds on the research literature on group heterogeneity (Jackson, May, and Whitney, 1995), which indicates that, in general, more heterogeneous groups are more creative and make better decisions.” As a result, the presence of breadth should generally cause a firm’s human resource bundle to be considered valuable.

RBT further posits that firm resources can be inimitable for three reasons: unique historical conditions, causal ambiguity and social complexity (Barney, 1991: 107). Human capital which is high in breadth is inimitable because of its causally ambiguous and socially complex nature. Knowledge resources are generally considered to be causally ambiguous (Reed & DeFillippi, 1990; Simonin, 1999) and especially so for knowledge which is diverse and broad in scope. As Grant (1996: 117) states, “The broader the scope of the knowledge integrated within a capability, then the more difficult imitation becomes. The complexity of ‘broad-scale’ integration creates greater causal ambiguity and greater barriers to replication.” Human capital breadth represents not only an integration of diverse of knowledge bases, but an increased social complexity due to interpersonal interaction. Access to knowledge bases occurs through interaction between group members. As group diversity increases, the nature of the interactions becomes increasingly complex. Group membership literature suggests that “[social] categorizations are used to reduce complexity and are more likely to be salient if they result in simple dichotomies” (van Knippenberg et al., 2011: 325). However, when group members differ in multiple independent dimensions (as breadth reflects) it decreases comparative fit (Turner et al., 1987) and increases the complexity of the social categorization process (Homan et al., 2008). This social complexity may be beneficial to the focal firm (as it reduces in-group vs. out-group conflict) but difficult for competitors to replicate. As a result breadth should lead human capital bundles to become classified as both valuable and inimitable. However, we argue that when the continuous nature of inimitability and value is taken into account, we can identify tensions between the two characteristics which may undermine performance. Specifically, high levels of heterogeneity will create a social complexity that, while preventing imitation, will also limit the ability of a firm to deploy and appropriate value from its human capital resource bundle (Sirmon & Hitt, 2003).

Social complexity and diversity come with a potential downside. Groups with new and diverse members may face significant adjustment costs and thus lower levels of “teamwork” (Penrose, 1959). We can gain further insight on team functioning from social psychology and teams literature. For instance, similarity – attraction theory suggests that homogeneous groups will be more likely to share goals and values, maintain group cohesion, and enjoy better team performance (Bryne, 1971; Horwitz & Horwitz, 2007). On the other hand, diverse groups may not be able to satisfy the identity needs of its members and thus have lower levels of commitment (Kristof-Brown, et al., 2005). In addition, diversity within groups increases the potential for conflict which undermines group performance. Team heterogeneity has been linked to several different types of intra-group conflict including task conflict, interpersonal conflict and emotional conflict (Lau & Murningham, 1998; Pelled et al., 1999). Diversity even within close-knit family groups can cre-
create a kinship distance which dilutes the potential of a well-functioning group (Ensley & Pearson, 2005). This relational conflict may be exacerbated by working within close settings with one another (Kellermans & Eddleston, 2004; Sciascia et al., forthcoming). As a result, increased social complexity can create an unhealthy amount of conflict, decreased communication, and unserviceable knowledge bases (Hambrick et al., 1996; Knight et al., 1999; Simons & Pelled, 1999). Consequently, the diverse and valuable knowledge and capabilities embedded within the human capital bundle of a group may not have the opportunity to be leveraged (Sirmon & Hitt, 2003).

Taken together, the above arguments suggest that while breadth is both valuable and inimitable, resource value is undermined at high levels of breadth due to the increasing level of inimitability. Specifically, the latent value of a broad and diverse knowledge base is not able to be deployed or appropriated due to increasing social complexity. The complex nature of diversity leads to intra-group conflict which hinders the group functioning necessary for resource utilization. As a result, we expect a curvilinear relationship between human capital breadth and performance such that moderate levels of human capital breadth will have stronger firm performance compared with firms associated with low or high levels of human capital depth.

Hypothesis 1: Human capital breadth will exhibit an inverse U-shaped curvilinear effect with a moderate amount of breadth being the optimal level for firm performance.

A RBT Perspective on Human Capital Depth

Human capital depth refers to the level of knowledge and experience which is applicable to the focal firm. Human capital bundles will differ in the level of knowledge, skills and experience capable of being put to productive use within a firm (Penrose, 1959). For instance, board members with industry experience can provide deeper and more applicable knowledge to the firms they serve (Haynes & Hillman, 2010). In addition, previous start up experience is a particularly salient type of knowledge in founding teams (Shane & Stuart, 2002). As a result, human capital bundles with a significant proportion of knowledge which is relevant to the focal firm will be high in depth. We argue that according to extant theory, depth should increase both the value and inimitability of a group’s human capital bundle.

Pertaining to value, increased experience in a given industry or in business ownership will represent a greater amount of human capital applicable to a focal firm. Human capital dimensions such as knowledge or network ties in the focal firm’s industry should be significantly more valuable than those for other industries. As a result, deep human capital is more efficient. For instance, advice based on within-industry experience may allow firms to avoid making mistakes that their members have made or observed based on their past experience in the given industry. In this respect, within-industry experience may produce group-level economies of learning over time (Yelle, 1979). In addition, business owners engage in similar activities and often face similar problems (MacMillan, 1986). As a result, previous ownership experience from close knit group members can provide knowledge which is leveraged for firm performance (Davidsson & Honig, 2003).

Human capital bundles high in depth should also satisfy the inimitability criteria of RBT due to its causal ambiguity. Groups accumulate knowledge which may be exploited by a focal firm through the industry and business ownership experience of individual group members. Experience and replication over time leads to the development of tacit knowledge which is causally am-
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ambiguous because it is impossible to codify and articulate (Nelson & Winter, 1982). However, while tacit knowledge is generally difficult to transfer it is passed on through direct team interaction and shared joint experience (Kogut & Zander, 1992). For instance, tacit knowledge is considered to be uniquely developed through the idiosyncratic interaction of family firm members (Habbershon et al., 2003). Moreover, experience-based knowledge is accumulated incrementally over time and is thus subject to time compression diseconomies (Dierickx & Cool, 1989).

Thus human capital bundles with depth should qualify as both valuable and inimitable. However, when we take into account the continuous nature of these characteristics, we can identify tensions between them. The deep levels of tacit knowledge accumulated over time are inimitable due to time compression diseconomies (Dierickx & Cool, 1989) but may also be subject to the myopia of learning (March & Levinthal, 1993). High levels of industry experience may condition individuals to a path dependence which overemphasizes local search and prevents the accumulation of new knowledge (March & Levinthal, 1993). Deep human capital may retard the generation of new ideas and range of strategies which can be used to increase efficiency (Barney, 1991). As a result, groups with high levels of human capital depth may rely too heavily on exploitation (vs. exploration) to their long-term detriment (March, 1991). In this way, deep human capital bundles may lead to a tendency to follow established norms, constrain strategic change (Haynes & Hillman, 2010) and decrease overall performance.

Taken together, while increases in depth may bolster the inimitability of human capital resources, it has conflicting effects on the value criterion of RBT. As with breadth, the increased inimitability of a human capital bundle will negatively impact that ability to deploy and appropriate value from that bundle of large amounts of industry knowledge and experience. When overall industry or business experience is low there should be clear benefits to increases in applicable knowledge, but very high levels of industry and firm experience will undercut human capital value due to path dependence. As a result, we expect there to be a curvilinear relationship between human capital depth and performance with moderate levels being optimal.

**Hypothesis 2:** Human capital depth will exhibit an inverse U-shaped curvilinear effect with a moderate amount of depth being the optimal level for firm performance.

**METHODS**

**Research Context**

We explore the impact of strategic human capital breadth and depth in the context of impoverished Indian household firms. This context is ideal to test our theory because families provide human capital as a unique bundle of resources to their firms and this provision is particularly salient in the case of impoverished firms.

The family’s provision of human capital is particularly salient in impoverished firm contexts for several reasons. First, in impoverished communities, business activity is often fully embedded within family households such that there is little distinction between the two as separate vehicles for economic activity (Aldrich & Cliff, 2003). As Aldrich and Cliff (2003) point out, 100 years ago family business was a redundant term, but changing household composition in the United States (e.g. decreased average household size and more children raised in single-parent households) has led to greater separation between these institutions. However, in less developed economic con-
texts, firms remain deeply embedded within family households (Khavul, Bruton & Wood, 2009). As a result, the human capital provided to the firm represents a critical strategic resource for impoverished firms. Second, when business activity is embedded within households, the family acts as the default governance mechanism. The family unit in established family firms generally enacts great influence on firms, even when governance boards are in place (Carney, 2005) and this tendency may be magnified in small and impoverished firms which often lack formal control systems such as boards and management teams. Third, small family firms depend on their family to provide resources (Danes et al., 2009; Sharma, 2008). The critical resources the family provides is particularly relevant in impoverished settings where a greater reliance on the family household may be necessary (Steier, 2009) and in cultures where there is a higher degree of collectivism (Hofstede, 1980). Fourth, human capital is a fundamental component of individual contribution to organizations (Becker, 1964) and the primary coordinating mechanism of other resources (Sirmon et al., 2007). This is critical within resource-depleted environments because it is the unique processes of “making due with resources at hand” enacted by individuals which allows impoverished firms to survive and possibly grow (Baker & Nelson, 2005).

Despite the strong relevance of family human capital in impoverished settings, there has been relatively little research on the topic conducted in such contexts. Management literature regarding the global poor generally is still in early stages (Bruton, 2010) and the research that does exist is largely conceptual (Webb et al., 2009) or case-based (Mair & Martí, 2009). However, the fact that family members in impoverished households live in such restricted spaces, with little privacy, coupled with the need to rely on each other for survival produces tremendous levels of interaction amongst members. This high level of interaction in addition to the embeddedness of family and business activity (Aldrich & Cliff, 1999) suggests that family human capital bundles should produce stronger relationships between family characteristics and business outcomes in the impoverished firm context. While the above provides the theoretical rationale for testing our hypotheses in this context, we provide a richer practical description of our empirical sample in the following section.

**Empirical Setting and Sample**

In 2007, a large microfinance organization in India extensively surveyed 6,798 households living in 120 slums in Hyderabad, Andhra Pradesh (India’s fifth largest city). In 1993 the National Sample Survey Organization (NSSO) in India adopted the definition of a slum as: “A compact settlement with a collection of poorly built tenements, mostly of temporary nature, crowded together usually with inadequate sanitary and drinking water facilities in unhygienic conditions (National Buildings Organization, 2011).” The Ministry of Housing and Urban Poverty Alleviation in India recently reported an estimated 70 million slum dwellers in the country (National Buildings Organization, 2011). This figure represents over a quarter of India’s large city populations.

The slums in our sample were selected based on having residents who were desirable microloan borrowers: impoverished, yet had the potential to generate income and repay loans. This classified the residents as ‘poor,’ but not ‘the poorest of the poor.’ Within each slum, surveyed households were randomly selected, conditional on the presence of a woman between the ages of 18-55. For each household, survey administrators identified the woman in this age range most knowledgeable about household finances. This respondent was asked for information on anyone who had resided in the household for at least 30 days in the past year and had contributed to and/or drawn from the household resources. For the purposes of our study, these individuals comprise...
the family members. The respondents were also asked whether or not any members of the family owned a business. If a business owner was identified, a separate survey was conducted with that individual; we were able to match these surveys with the corresponding households. In total, the surveys took between one and two hours to complete. Our sample is comprised of these surveys on 1,967 firms in 1,564 families. The size of our subsample is the result of two factors. First, most of the households surveyed did not have a business. Second a significant amount of missing data was present in the sample; we discuss this factor in our limitations section.

**Dependent Variable**

Measuring firm performance within an impoverished context is a challenging task, primarily due to the fact that detailed accounting records are rarely kept. Absent such records, we were forced to rely upon figures drawn from respondents’ memories. As a result, the longer the time period over which performance is measured, the greater the likelihood of recall biases. Furthermore, a lack of accounting records limits the types of performance measures available. Asking an owner without such records to produce their firm’s return on investment over a certain time period, or growth from one time period to another introduces further complexities and biases. Therefore, we use the respondent’s estimation of sales over the last week. The rationale is that one week is a short enough time period to accurately recall the figure, yet long enough to represent a larger business cycle. In addition, this measure may counter-intuitively be more reflective of impoverished firm performance than alternative measures. Impoverished firms have survival and satisfaction of immediate family needs as primary goals and thus performance within the last week may provide the best indication of their ability to provide for and ensure the survival of the family household.

**Independent Variables**

**Breadth.** Family human capital breadth is meant to capture the heterogeneity of human capital factors in a family. The more diverse a family is, the greater the variety of perspectives, knowledge, advice, counsel, experience, and contacts that may be offered by the collective members. We treat human capital as a multidimensional construct and utilize three measures of family human capital to produce the breadth construct – business expertise diversity, educational diversity, and age diversity. As business expertise is a categorical variable, we calculated a Blau index to operationalize its diversity. Business expertise refers to the type of business the individual listed as their primary occupation. There are 41 such categories; the top 10 most common are: tailor, labor, food vendor, agriculture, product vendor, transportation, finance, communications, retail, and grooming. For the continuous variables - educational level and age - we calculated the coefficient of diversity (Allison, 2003). Education level is the individual’s last grade level completed ranging from ‘Kindergarten or less’ to ‘Second year post graduation’. All three measures were calculated for the whole family, excluding the focal business owner. The measures were then summed to create the breadth variable.

**Depth.** Family human capital depth refers to the family’s embeddedness in the focal firm’s industry and the focal business owner’s occupation. That is, families with more business owners and members that work in a business of the same type as the focal business owner will have greater depth. As a result, our measure of depth captures both industry-specific and meta-industry family human capital (Sieger et al., 2011). The greater the family human capital depth, the more related and applicable the family’s human capital is to the business owner and firm. The depth variable is a composite of two measures. The first is a ratio of the number of family members (excluding
the focal business owner) that have an occupation in the area of the type of business, over the number of family members in the household. The second is a ratio of the number of business owners (excluding the focal business owner) in the family over the number of family members in the household. The two measures were summed to create depth.

**Control Variables**

We control for several variables that may account for variance in family human capital and firm performance, including: 1) the top 10 most common type of business; 2) the size of the family; 3) the number of partners in the business; 4) whether or not the firm has employees; 5) whether or not the business uses electricity; and 6) whether or not the business was founded in the last year.

**Models and Analysis**

To account for the non-independence of the error terms for multiple firms that came from the same family, we took two steps. First, the data were modeled as cross-sectional panels with random effects; the households representing the panel variable. Second, we clustered standard errors by family. To test our hypotheses, we ran two nested models which are presented in Table 1. Model 1 is comprised of the control variables only. In addition to the control variables, Model 2 includes the breadth and depth terms as well as the squared terms of each to test the curvilinear effects.

**RESULTS**

Hypothesis 1 predicted that family human capital breadth will exhibit a curvilinear effect with a moderate amount of breadth being the optimal positive for firm performance. The breadth term in model 2 is positive and the squared breadth term is negative and significant ($\beta=2.27; p<.05$). To shed more light on the results, we plotted the relationship between breadth and performance in Figure 1. As predicted, the optimum amount of family human capital breadth is a moderate level, with high levels of breadth corresponding to the lowest levels of performance. Taken together, we find support for hypothesis 1.

Hypothesis 2 predicted that family human capital depth will exhibit a curvilinear effect with a moderate amount of depth being the optimal level for firm performance. The coefficient for depth in model 2 is positive and the squared term is negative and significant ($\beta=1.51; p<.05$). This indicates an inverted U-shaped relationship between depth and performance. The plot of the relationship provided in Figure 2 shows that a moderate level of family human capital depth corresponds to the highest level of performance. Hypothesis 2 was therefore supported.

**DISCUSSION**

Whereas previous research has treated VRIN resource characteristics as dichotomous and largely independent of one another (Crook et al., 2008), this study provides evidence that resource characteristics are continuous, interrelated and potentially conflicting. We find that increasing levels of inimitability ultimately undermine resource value in both broad and deep human capital resource bundles. Our findings run counter to previous tenants of RBT which claim that resources are most valuable when they meet all VRIN characteristics (Barney, 1991; Newbert, 2007) and
imply that higher levels of each characteristic is more desirable (Priem & Butler, 2001). As such, we view our results as an extension to RBT which opens the potential for new theorizing in several ways. First, treating resource characteristics as continuous begs an important question of the level at which a given resource should be considered valuable, rare, inimitable or non-substitutable. Further research should identify salient reference points for measuring the level of each resource characteristic. For instance, should value or rarity be compared to a firm’s industry, geographic location or self-selected peer group? The answer is likely to be subject to boundary conditions such as environmental settings (Miller & Friesen, 1983), organizational goals (Thompson & McEwen, 1958), the specific resource examined or the dependent variable of interest. However, one source of inspiration may come from recent entrepreneurship literature which has sought to identify relevant criterion for measuring the level of newness in venture opportunities (Dahlqvist & Wiklund, 2012). Measuring how “new” an intangible idea is may be similar to measuring how valuable or rare a given resource is. Second, our finding regarding the conflicting impact of inimitability on value allows for new theorizing on the relationship between resource characteristics. Our research suggests that the latent assumption that resource characteristics positively covary should not be taken for granted. High levels of inimitability may negatively impact value in different resource bundles such as social capital or physical capital. With either of these resource bundles, it is not difficult to imagine that increasing levels of social complexity could simultaneously decrease the threat of imitation and limit the potential value extracted from the resource bundle. Complex social networks tend to evolve in a largely autonomous fashion which makes them both hard to replicate and difficult to organize in a manner ideal for any individual entity to appropriate value from it (Nahapiet & Goshal, 1998). In addition to the tension between inimitability and value in different resource bundles, there are likely to be tensions which exist between other resource characteristics. For instance, it may be possible that a given resource bundle is so rare that it is nearly impossible to extract value from it. This may be especially relevant in firms with new technologies which are ahead of their time and lack the opportunity window to exploit the rare resource. We hope that the relationships between resource characteristics – both constructive and conflicting – will provide a foundation for new theoretical development in the RBT tradition.

Limitations

Our study includes a number of limitations, many of which represent fruitful avenues for future research. First, the most significant limitation in our study is that we test for resource value and inimitability using the same indicator. While we have developed the theoretical argument as to why human capital breadth and depth each represent both value and inimitability, future research would benefit from capturing these characteristics using separate indicators. Second, a clear limitation is that our data is cross-sectional; among other issues this manifests the potential for reverse-causality in our findings. Third, our study was conducted in one country and in an unconventional setting. On one hand, this limits the generalizability of our findings. On the other hand, we provide insights into a highly understudied population, and the lack of generalizability provides opportunities for future research to be conducted in more conventional research contexts. Fourth, the nature of our research setting limited our ability to employ more sophisticated measures of firm performance and as a result we were limited to using estimations of sales over a relatively short time period (one week). Future research utilizing more sophisticated measures of firm performance may inform our findings further.

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Notes

1. See Newbert (2008) for a notable exception.
2. The VRIN model has since been updated as VRIO, where O represents that the firm is organized in a way that is capable of fully exploiting its resources (Barney, 1997). We are concerned with the characteristics of specific resources and thus apply the original VRIN model since they are resource-level attributes whereas O (organization) is a firm-level construct (Barney, 1997).
3. Women between the ages of 18 and 55 are the typical clients of microfinance institutions. Moreover, as they are typically charged with the maintenance of the household, they are well-suited to answer questions concerning the household and its members.

References


### TABLES AND FIGURES

**Table 1. The Effects of Family Human Capital Breadth and Depth on Firm Performance†**

<table>
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<tr>
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<td>-0.33 (0.36)</td>
<td></td>
</tr>
<tr>
<td>Communications</td>
<td>0.18 (0.30)</td>
<td></td>
<td>-0.07 (0.30)</td>
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</tr>
<tr>
<td>Retail</td>
<td>1.54*** (0.24)</td>
<td></td>
<td>1.38*** (0.26)</td>
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</tr>
<tr>
<td>Grooming</td>
<td>0.83* (0.84)</td>
<td></td>
<td>0.67 (0.36)</td>
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</tr>
<tr>
<td>Size of family</td>
<td>0.08** (0.03)</td>
<td></td>
<td>0.03 (0.03)</td>
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</tr>
<tr>
<td>Number of partners</td>
<td>0.04 (0.11)</td>
<td></td>
<td>0.06 (0.12)</td>
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<tr>
<td>Employees</td>
<td>1.61*** (0.26)</td>
<td></td>
<td>1.74*** (0.27)</td>
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<tr>
<td>Uses electricity</td>
<td>0.70*** (0.13)</td>
<td></td>
<td>0.65*** (0.14)</td>
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</tr>
<tr>
<td>Founded in last year</td>
<td>-0.57** (0.19)</td>
<td></td>
<td>-0.48* (0.20)</td>
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</tr>
<tr>
<td>IVs</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Depth</td>
<td>1.51 (1.05)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Depth-squared</td>
<td>-4.86* (2.27)</td>
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<tr>
<td>Breadth</td>
<td>2.27 (1.09)</td>
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</tr>
<tr>
<td>Breadth-squared</td>
<td>-0.48* (0.23)</td>
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<tr>
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<th>Model 1</th>
<th>Model 2</th>
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<tr>
<td>R²</td>
<td>0.11***</td>
<td>0.13***</td>
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<tr>
<td>Wald χ²</td>
<td>327.65</td>
<td>308.54</td>
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†: N = 1,967
*: significant at .05 level
**: significant at .01 level
***: significant at .001 level.
Figure 1. Curvilinear Effect of Family Human Capital Breadth on Firm Sales

Figure 2. Curvilinear Effect of Family Human Capital Depth on Firm Sales