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HOW FAMILY INFLUENCE, SOCIOEMOTIONAL WEALTH, AND COMPETITIVE CONDITIONS SHAPE NEW TECHNOLOGY ADOPTION

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***Research summary*:** *In family businesses, investment decisions often involve both socioemotional wealth and economic considerations. Focusing on new technology adoption, we argue that multiple dimensions of socioemotional wealth contribute to complex effects within different types of family firms—depending on the level of family control—as well as in contrast to non-family firms. Results based on cable TV operators from 1983 to 1987 confirm that family ownership correlates negatively with technology adoption, especially when family owners hold a minority rather than majority position. We also show contingencies based on performance improvements and competitive threats. Our arguments contribute new insights about the tensions between economic and socioemotional factors within minority family ownership that are absent from non-family firms and more pronounced than in majority family firms.*

***Managerial summary*:** *We find evidence of greater reluctance toward new technology adoption among firms with minority family influence than majority family influence. This suggests that goals related to socioemotional wealth only partly explain the cautious decision-making observed in family firms, with further caution arising from conflicting priorities between family and non-family owners. Recent performance improvements help offset the reluctance to adopt new technology, albeit to a lesser degree among firms with minority family ownership. High levels of competitive threats also offset the reduction in new technology adoption, and contrary to expectations, to a greater extent among minority family firms.*

INTRODUCTION

Most strategy research expects economic potential to represent the primary motivation for business decisions. In family firms, however, a growing literature describes a behavioral decision-making process through which socioemotional wealth considerations—aimed at perpetuating the family dynasty by retaining family control of and identity with the firm—takes precedence over a more traditional assessment of economic costs and benefits (Gomez-Mejia *et al.*, 2007)[1]. Among several

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[1] We designate "family firms" as businesses in which a single family has an ownership stake of at least five percent.

implications of this research stream, scholars have concluded that socioemotional wealth implies a preference among family firms for tradition and stability, noting that these preferences may dissuade certain investments perceived as risky, such as R&D (Chrisman and Patel, 2012) or new technology adoption (König, Kammerlander, and Enders, 2013). In addition to the inherent risk of potential economic loss, the fresh capital and expertise often needed to pursue such investments also increases the risk that family influence in the firm might decline because of changes in decision-making processes and management style, resulting in diminished power to pursue the family agenda (Leitterstorf and Rau, 2014).

Extending the logic of socioemotional wealth, we further distinguish between firms with minority family ownership and those with majority family ownership. Departing from the existing presumption that socioemotional wealth increases along with family influence, we argue that conflicts between economic and socioemotional considerations are greatest when ownership is shared between minority family and non-family interests, because it is difficult to build consensus about how to incorporate the family's socioemotional goals with the pursuit of economic returns that benefit all owners. In these settings, the inability of minority family owners to prioritize socioemotional wealth can increase the reluctance of such owners to pursue new risky investments that might further threaten their influence in the firm. By contrast, families with a majority ownership position can unilaterally resolve tradeoffs between socioemotional wealth and economic returns based on family priorities. Thus, firms with minority family ownership feature tensions between economic and socioemotional factors that are less severe in firms with a majority family interest and absent in non-family firms.

Our study proposes and demonstrates that firms with minority family interest adopt technology differently than both non-family firms and firms with majority family interest. We explore the nuances of socioemotional wealth by identifying conditions under which majority family firms behave more similarly to non-family firms than to minority family firms. The empirical context, cable TV operators in the mid-1980s, offers two essential features: (1) variation in family control, and (2) firm-level data on investment in new technology. Specifically, during this period cable operators could invest in new infrastructure to provide an expanded line-up of cable channels, which offered the potential for future growth but involved significant capital outlays and operating changes. The interplay of economic and socioemotional wealth considerations suggests important differences between minority and majority family interest in addition to the longstanding distinction between family and non-family businesses.

Applying our theoretical arguments to cable TV operators, we expect that family influence correlates negatively with the capital-intensive initiative to adopt new technology, and to a greater degree when the family holds a minority rather than majority position. By analyzing the decision to adopt new technology across different ownership structures, we contribute to a deeper understanding of socioemotional wealth in several ways. First, we argue that new technology adoption poses a threat to the socioemotional component of utility, making the cost of new technology adoption higher for family owners relative to non-family owners. Second, building on research into the dimensionality of socioemotional wealth (Berrone, Cruz, and Gomez-Mejia, 2012; Chua, Chrisman, and De Massis, 2015; Gomez-Mejia *et al.,* 2011; Miller and Le Breton-Miller, 2014) we argue that affinity factors of socioemotional wealth—such as family identity, emotional attachment, and social connectedness through the firm—represent the distinguishing socioemotional factors between family and non-family firms, whereas factors related to control (Berrone *et al.,* 2012) or command (Miller and Le Breton-Miller, 2005) change the ability of majority family owners to preserve and pursue these affinity factors through investment decisions relative to minority family owners. Consequently, minority family firms have their socioemotional utility at greater risk, as their level of control can be further reduced if adopting new technology requires the firm to raise new external capital.

Finally, we model internal and external contingencies that change the perception of socioemotional losses help to further define the boundary conditions of socioemotional wealth.

Munificent internal conditions resulting from performance improvements provide a gain context for family firms through the application of those additional resources, while competitive external threats make cumulative economic and socioemotional losses more salient to family owners. These contingencies impose different risks on family preferences, with the resultant decision framing

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highlighting nuanced tensions in understanding how minority and majority family influence play out differently regarding socioemotional wealth.

THEORY AND HYPOTHESES

Differentiating investment behaviors based on socioemotional wealth

Socioemotional wealth refers to the non-economic connections felt by a family with its business, including control, influence, social capital, intergenerational succession, family identification, and family values (Gomez-Mejia *et al.,* 2011). As evidence that family owners often prioritize socioemotional wealth, existing research finds that family firms accept lower stock valuations during initial public offerings in exchange for retaining family control (Leitterstorf and Rau, 2014), and that family firms avoid acquisitions that threaten family control, routines, and values (Miller, Le Breton-Miller, and Lester, 2010). In addition, the notion of socioemotional wealth implies expectations for generating non-economic utility that benefits the family. Such utility comes from many sources including the preservation of family involvement for intergenerational succession, family legacy and firm culture, and the values and routines inherent in how the organization conducts business (Chrisman and Patel, 2012; Leitterstorf and Rau, 2014). Evidence suggests that family firms seek to protect elements central to their socioemotional wealth, including reputation, relationships and social capital (Gomez-Mejia *et al.,* 2007), and such preferences can be expressed by family owners through their investment decisions.

This paper builds on the premise that family firm decisions reflect broad criteria that go beyond economics whereas non-family firms focus mainly on economic returns (Feldman, Amit, and Villalonga, 2016). Prior research articulates a range of socioemotional goals. Miller and Le Breton-Miller (2005) develop the "four C" taxonomy which describes continuity, command, community, and connections as important areas of emphasis for family firms. Similarly, Berrone *et al.* (2012) propose five dimensions of socioemotional wealth—dynastic succession, family control, identification with the firm, social ties, and emotional attachment. Families with a majority ownership position have unimpeded pursuit of socioemotional goals (Deephouse and Jaskiewicz, 2013), which suggests an interdependence between socioemotional factors based on command or control and other more affinity-based factors, such as family identity, emotional attachment, and familial connectedness within and outside of the firm. These multiple dimensions of socioemotional wealth likely lead to complex effects during the decision-making process.

Family ownership and new technology investments

In the presence of satisfactory economic returns and the absence of countervailing competitive forces that would threaten firm dynastic succession, the "default" for families is to preserve their existing stock of socioemotional wealth as family members cling to their influence (Chua *et al.,* 2015; Miller and Le Breton-Miller, 2014; Vardaman and Gondo, 2014). Family owners may therefore avoid new technology adoption (König *et al.,* 2013) because of the risk that changing the internal landscape of the firm—through the introduction of new methods of operation and potentially new personnel—could threaten the family's understanding of and influence over the firm's standard operating procedures and routines that challenge family values and stability (Gomez-Mejia, Makri, and Lazzara-Kintana, 2010). A change to new technology threatens to diminish affinity-related dimensions of socioemotional wealth—i.e., the conflation of familial and social identity through the firm—in addition to the potential dilution of family control if the new technology requires additional capital that the family is unwilling to provide.

Facing such threats to socioemotional wealth, we identify the potential for loss aversion behaviors to arise (Chrisman and Patel, 2012; Leitterstorf and Rau, 2014). Loss aversion has been observed when firms prefer alternatives that avoid all perceived losses in comparison to situations where the likelihood of losses may be higher, but also more constrained within manageable levels (Lim, Lubatkin, and Wiseman, 2010). With socioemotional wealth at risk, family owners are likely to perceive new technology adoption as a potential source of loss. This represents loss aversion with respect to affinity and control, as opposed to economic losses.

Non-family firms offer a meaningful contrast because affinity and control will be less compelling motivators, and decisions to adopt new technology

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will be made primarily on their economic merits, not perceived socioemotional losses. Consequently, in family firms new technology adoption must satisfy two different sets of criteria—economic and socioemotional—whereas in non-family firms only the economic criteria must be met. Both types of firms will reject opportunities with inadequate economic returns, but family firms will also avoid some economically promising opportunities that fail to meet their socioemotional objectives. These additional decision criteria are likely to make family firms more reluctant to adopt new technology than non-family firms, and lead to our baseline hypothesis:

Hypothesis 1a (H1a): Family ownership is negatively related to new technology adoption compared to non-family firms[2].

Level of family control

To this point we have argued that differences in new technology adoption among firms with and without family owners can be largely explained by analyzing the implications for loss of family owners' affinity and control. We now extend this reasoning to differentiate between family firms with a majority ownership interest and family firms with only a minority stake in the firm (Berrone *et al.,* 2012). For the latter type of family firm, all concerns about the risk of reduced influence will be heightened. In order to pursue actions that retain or enhance socioemotional benefits, families with a minority stake must gain consensus from non-family owners who typically lack such socioemotional objectives. Because non-family owners collectively own a majority of the firm, gaining their support is far from guaranteed. The decision-making process for a major investment like new technology adoption is then likely to be fraught and difficult, regardless of the eventual outcome, because the goals of family and non-family owners diverge with respect to socioemotional interests. Under these conditions, "some degree of compromise among principals is needed, since one principal cannot unilaterally force its particularistic agenda on the rest" (Gomez-Mejia *et al.,* 2011: 688).

Relative to the delay and fraught decision-making process prevalent in minority family firms, majority family firms are more likely to resolve the tension between economic and socioemotional priorities internally. For example, if the family prioritizes socioemotional considerations, it will act to protect the firm's relationships, identity and values. The firm would avoid adopting new technology if such a decision would also require raising so much capital that the family's control of the firm would disappear. Majority family owners would accept any negative economic consequences of this decision as the cost of preserving socioemotional wealth. Non-family owners (if any) would also be subject to these economic consequences, but their minority status would leave them unable to override the controlling family's socioemotional emphasis. Even though family members sometimes disagree over the prioritization between economic and socioemotional objectives, resolving such disagreements is more tractable than in a scenario where a sizable stake owned by non-family members places no weight on socioemotional considerations at all.

Combining these arguments, the loss framing associated with investment in new technology is particularly salient to families with minority ownership because their lack of full decision control means that socioemotional priorities can only be achieved through implicit negotiation with other owners who lack the affinity-related emphasis of family owners. A risky initiative like new technology adoption receives primarily loss framing for families with minority ownership positions ("this further threatens our stake in this family business"), whereas families with a majority interest may combine such loss framing with the potential for gain framing as well ("as long as we can do it without threatening our control, this opportunity can help grow the business and sustain our legacy"). Our arguments suggest the following hypothesis:

Hypothesis1b (H1b): Minority family ownership is more negatively related to new technology adoption than majority family ownership.

We now consider internal and external contingencies that influence the loss framing of new technology adoption decisions. First, we consider how

[2] H1a follows a parallel structure to a hypothesis offered by Chrisman and Patel (2012), who found evidence that family ownership was negatively related to R&D spending. Given that R&D and new technology adoption typically share some attributes—such as high risk and a multi-year time horizon—they are likely to be influenced similarly by socioemotional wealth. However, they represent distinct constructs and we consider it complementary rather than redundant to include H1a in our analysis.

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performance improvements provide additional capital that partly offset the economic constraints on investment that often confront family firms. Second, we analyze how the competitive environment can create the potential for economic losses that imperil the dynastic potential of the business and shifts perceived family returns that can be realized through new technology adoption.

Performance improvements

Any firm that improves its performance over time should generate additional financial resources that can be used to invest in new technology. In general, we do not expect performance gains to overcome the deficit in motivation to adopt new technology between family and non-family firms that we argued for in Hypothesis 1a. Nevertheless, we do expect the effect of performance improvements to play out differently for family vs. non-family firms. In particular, the effect of having additional resources to invest in new technology adoption will likely be weaker among family firms because their utility and decision process is not motivated by purely economic factors but also by socioemotional considerations.

Although performance improvements may alleviate some economic constraints and the associated threats to family control, they do not alleviate concerns related to affinity factors that contribute to socioemotional wealth. Thus, new technology adoption still challenges existing social capital and changes organizational routines and identity. Moreover, family owners may prefer to return any additional financial resources to the family through dividends whereas non-family owners may prefer to reinvest in growth (Gomez-Mejia *et al.,* 2011). For non-family owners, additional resources increase the appeal of adopting new technology because future gains from the technology may be achievable without taking on further financial risk. Thus,

Hypothesis 2a (H2a): Performance increases are more positively associated with technology adoption in non-family firms than in family firms.

In minority family owned firms, the extra financial resources available internally likely exacerbate the conflict between family and non-family owners. Although the firm has greater means to adopt the new technology, high potential for conflict exists about how to spend these extra resources. New technology adoption, and the corresponding need to add employees, may threaten to erode the already-limited influence of minority family owners. The fear of losing further influence will lead minority family firms to contest using new resources to adopt technology when alternatives with less potential to diminish family influence—such as paying dividends—are available. Thus, the opportunity that is provided by resource availability from superior performance will lead to ambivalence in minority family firms because exploiting that opportunity risks loss of family influence. Such ambivalence and potential disagreement leads to slower technology adoption in minority family firms relative to majority family firms.

Gain framing logic supports this argument in that decision makers tend to take less risk when things are going well and performance has been improving (Lim *et al.,* 2010; Wiseman and Gomez-Mejia, 1998). Non-family owners in firms with minority family ownership may be less willing to make the decision to adopt new technology because of the associated high risk of alienating family owners with that decision. Thus, there is likely less motivation on the part of minority family firms to adopt new technology adoption when the decision-making process is contentious. With family control, there is less concern that adopting new technology will reduce family influence because family owners can still advocate for the full range of their socioemotional goals. Thus, we expect a greater willingness to use internal resources generated by performance improvements for new technology adoption among majority family firms than minority family firms:

Hypothesis 2b (H2b): Performance increases are less positively related to new technology adoption for firms with minority family ownership compared to firms with majority family ownership.

Competitive environment

We now transition from the contingencies created by internally munificent performance conditions to the external threat posed by competition. High levels of competition decrease economic returns for all firms, but for family firms they also decrease socioemotional utility by reducing the value of

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handing over the firm to the next generation. As a result, we expect different behaviors in response to competitive threats among family firms relative to non-family firms. In the strictly economic calculation of non-family firms, high levels of competition call into question the efficacy of further investment in the firm. The cost of new technology adoption may be more difficult to recover and thus we expect that as competition increases, non-family firms become increasingly reluctant to invest in new technology as they consider alternatives to minimizing their potential economic losses.

Conversely, family firms often prioritize dynastic succession and family legacy by maintaining family involvement in the firm over future generation (Berrone *et al.,* 2012). Such an emphasis amplifies concerns about socioemotional losses if the firm cannot survive competitive threats. Low economic returns represent a secondary rather than primary concern. If adopting new technology increases the likelihood of firm survival, even if expected economic returns on these investments are poor, such adoption becomes relatively more likely among family firms facing high threats of competition than among non-family firms in the same situation.

Our reasoning corresponds to two findings from recent research. Chrisman and Patel (2012) argue that family firms generally invest less than non-family firms in R&D, except when compelling economic circumstances lead family firms to accelerate R&D investment. Similarly, Gomez-Mejia *et al.* (2010) found that family firms resist new products because external capital and potential reorganization threaten their socioemotional wealth, only choosing to do so when they felt that not doing so would present an even greater threat to their survival. We extend this theme to argue that increased levels of competition help offset the normal reluctance of family firms to adopt new technology because the threat posed by this external contingency influences socioemotional wealth differently than economic returns. Thus, we expect greater competition to moderate the effect of family influence, increasing the adoption of new technology among firms with family ownership compared to non-family firms.

Hypothesis 3a (H3a): The level of competition is more positively related to new technology adoption among family firms compared to non-family firms.

We expect the aforementioned effect of high competition to increase the likelihood family firms will adopt new technology to be even stronger for majority family firms than for minority family firms. Even though the economic threat is similar across both levels of family interest, the threat to the loss of socioemotional utility may be greater for majority family firms. Majority family owners work to preserve their socioemotional wealth even as competitive conditions place pressure on organizational routines, values, brand and social capital. However, majority family owners are most likely to see family dividends and socioemotional wealth dissipate as the firm engages in a competitive rivalry, placing them in the most extreme loss position. Majority family owners see themselves as being much more invested and committed to the firm because of their majority stake, and hence have more socioemotional wealth to lose under competitive threats. As a result, majority family owners are most likely to push for new technology adoption. In comparison, despite the higher motivation of the minority family owned firms, their limited opportunity to make decisions that involve the firm as a whole will limit their adoption. As a result, under more competitive conditions we expect that majority family owned firms are more likely to adopt new technology than minority family owned firms.

Hypothesis 3b (H3b): The level of competition is more positively related to new technology adoption for firms with majority family ownership compared to firms with minority family ownership.

METHODS

Setting

We focus on cable TV operators in a five-year window from 1983 to 1987 as the empirical setting for this research because this industry provides both necessary conditions for this study: (1) a substantial number of firms in each of the categories of no family ownership, minority family ownership, and majority family ownership; and (2) data available to estimate new technology adoption at the firm level of analysis. Specifically, the industry was evolving at this time due to the development of technology that allowed cable operators to expand from offering customers approximately 13 channels

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to over 50 channels. Although hindsight reveals these expanded channel offerings to be popular with cable subscribers, at that time many cable operators were skeptical they could recoup the necessary upfront costs.

The setting helps rule out alternative explanations because cable operators acted as a natural monopoly (Emmons & Prager, 1997)[3]. For similar reasons, the industry has been used in prior research to study several types of strategic decisions, including governance form (Seamans, 2012; Williamson, 1976), ownership structure (Eisenmann, 2002), motivations for long horizon investments (Souder and Shaver, 2010), and investment patterns over the tenures of founding vs. non-founding CEOs (Souder, Simsek, and Johnson, 2012). Even though cable operators rarely faced competition from each other, they did face competition from free, over-the-airwaves television. As described below, this provides a way to measure variable levels of competition at the firm level.

Data were collected from the annual publications of two industry sources. Ownership data came from the annual *TV and Cable Factbook* compiled by Warren Publishing. Subscriber details and pricing were taken from an annual industry report published by Paul Kagan & Associates. We limit the study to five years because this represents the appropriate periodicity to study the adoption of this particular technology (c.f. Zaheer, Albert, and Zaheer, 1999). Prior to 1983, the number of firms offering expanded basic channels was too small to warrant attention in the Kagan report. After 1987, the tracking of firms offering expanded basic service becomes less precise, presumably because it was no longer a significant differentiator between firms. For this five-year period, however, the variance between firms was sufficiently noteworthy to generate prominent coverage by industry analysts. The final sample includes 321 yearly observations from 79 unique firms.

Dependent variable

New technology adoption

All but two firms in the study are multi-system operators (MSOs), owning cable systems in more than one location. MSOs can adopt new technology across their entire system at once, or phase it in more gradually. Our ideal measure would be the percentage of systems that had adopted the new technology, but source documents do not report this information. However, these sources provide a suitable proxy by reporting the percentage of a firm's basic subscribers who choose to receive expanded basic service that increases the number of channels from around 13 to over 50. We use this percentage as the dependent variable, *new technology adoption*. Clearly, customers cannot purchase expanded basic cable service if their cable operator does not make it available. On the other hand, customers in some markets might be more willing to purchase expanded basic service than customers in other markets.

We present descriptive statistics in Table 1 and zero-order correlations in Table 2. In our sample, the average new technology adoption was 21.5 percent. This percentage can exceed 100 percent (to a maximum value of 103.9%) in rare instances when a cable operator allowed subscribers to purchase "expanded basic" service without first purchasing "basic" service. At the other extreme, the minimum value for new technology adoption equals zero percent because expanded basic service was not available for at least one quarter of cable operators in each year of the sample.

Explanatory variables

Family ownership

Much prior research employs a dichotomous distinction between family vs. non-family firms, using a cut-off point which ranges from 5 percent family ownership (e.g., Chrisman and Patel, 2012) to 50 percent family ownership (e.g., Miller, Minichilli, and Corbetta, 2013). By theorizing distinctions between minority and majority family ownership, we find it useful to use both of these cut-off points in our analysis. We therefore create three variables to represent family ownership. First, we construct a dummy variable called *family–minority interest* that equals 1 if the largest family ownership position in a firm is at least 5 percent and no more than 50 percent. This designation applies to 21 percent of the firm-years in our sample. Second, we construct a dummy variable called *family–majority interest* that equals 1 if the largest family ownership position is 50 percent or

[3] Note that this industry attribute changed after the end of the study period. In 1996, the U.S. Congress passed a Telecommunications Reform Act that allowed and encouraged direct competition between cable and phone companies in each other's traditional franchised territories (Parsons and Frieden, 1998).

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Table 1. Descriptive statistics

	Mean	SD	Min	Max	VIF	Measure
Dependent variable						
New technology adoption	21.56	22.72	0.00	103.90	NA	Percentage of subscribers with "Expanded Basic" service
Control variables						
Firm size	43.72	71.45	1.00	564.00	1.69	Count of systems owned by the firm
Pricing policy	−0.01	1.34	−7.79	4.53	1.05	Firm's price for "Basic" cable minus that year's average price
Cross ownership	0.07	0.23	0.00	1.00	1.13	Percentage of the firm owned by a different cable operator
Public financing	0.08	0.24	0.00	1.00	1.30	Percentage of the firm owned directly as publicly-traded shares
Explanatory variables						
Performance improvements	1.53	3.11	−9.46	14.81	4.06	Firm's annual % growth in revenue per home in franchised area[a]
Level of competition	5.60	43.31	−35.25	225.82	2.28	Firm's average homes per franchised area (000 s)
Family ownership	0.64	0.48	0.00	1.00	NA	Equals 1 if a family holds more than 5% of the firm's equity
Family - minority interest	0.21	0.41	0.00	1.00	1.66	Equals 1 if a family holds 5–50% of the firm's equity
Family - majority interest	0.42	0.49	0.00	1.00	2.12	Equals 1 if a family holds more than 50% of the firm's equity
Year dummies						
Year 1983	0.15	0.36	0.00	1.00	1.31	Equals 1 for data from 1983
Year 1984	0.19	0.40	0.00	1.00	1.39	Equals 1 for data from 1984
Year 1985	0.21	0.41	0.00	1.00	1.51	Equals 1 for data from 1985
Year 1986	0.20	0.40	0.00	1.00	1.46	Equals 1 for data from 1986
Year 1987	0.24	0.43	0.00	1.00	NA	Equals 1 for data from 1987
Interaction terms						
Minority interest × performance gains					2.46	
Controlling interest × performance gains					2.87	
Minority interest × level of competition					1.52	
Controlling interest × level of competition					1.77	
Average VIF					**1.85**	

[a] Winsorized at the 1% level to reduce sensitivity to outliers.
SD = standard deviation.

higher. An additional 42 percent of the firm-years in our sample meet this qualification. We describe the remaining 36 percent of observations, which have less than 5 percent family ownership, with the label *non-family*. Third, we combine the categories into a single measure of *family ownership* (i.e., all firms with at least 5% family ownership) because some hypotheses compare family firms directly to non-family firms.

Our data also allow us to construct a continuous measure of family ownership as suggested by König *et al.* (2013). However, we have chosen to present results based on the dummy variables described previously because our theory defines a substantive difference in socioemotional wealth based directly on having a majority stake in the company. The dummy variables have the additional advantage of facilitating more intuitive discussions. We have performed robustness checks using the continuous measure to verify it produces similar results.

Performance improvements

Cable operators were focused on revenue growth during the study period, so we have defined *performance improvements* as the year-to-year change in revenue for each firm. Because of the possibility for extreme changes in performance that might distort results, we have winsorized this variable at the one percent level. After winsorizing, firms in our sample ranged from a 9 percent decrease in revenue to a 15 percent increase in revenue. On average, the mean performance improvement for a firm in the sample was 1.5 percent.

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Table 2. Zero-order correlations

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	New technology adoption	1.00															
2	Firm size	−0.08	1.00														
3	Pricing policy	−0.32	0.07	1.00													
4	Cross ownership	−0.05	−0.02	0.06	1.00												
5	Public financing	−0.09	0.30	−0.10	−0.08	1.00											
6	Performance improvements	0.09	−0.02	0.06	−0.05	−0.02	1.00										
7	Level of competition	0.07	−0.22	−0.04	−0.09	−0.11	−0.07	1.00									
8	Family ownership	−0.05	0.00	0.00	−0.17	−0.18	0.01	−0.08	1.00								
9	Family - minority interest	−0.15	0.26	0.02	0.09	0.09	−0.02	−0.06	0.39	1.00							
10	Family - majority interest	0.08	−0.22	−0.02	−0.25	−0.24	0.02	−0.02	0.65	−0.45	1.00						
11	Subscriber growth vs. peers	−0.01	0.04	0.09	0.03	0.00	−0.06	−0.06	0.18	0.14	0.05	1.00					
12	Year 1983	−0.09	0.04	−0.01	−0.01	0.04	0.01	0.05	−0.08	0.00	−0.08	−0.08	1.00				
13	Year 1984	−0.02	0.02	−0.03	0.01	0.00	0.01	−0.01	−0.02	0.00	−0.01	−0.08	−0.21	1.00			
14	Year 1985	0.03	−0.03	0.01	−0.05	−0.02	0.19	0.00	0.02	−0.01	0.02	0.09	−0.22	−0.25	1.00		
15	Year 1986	0.05	−0.01	−0.01	0.01	0.01	−0.21	0.03	0.03	−0.01	0.04	0.01	−0.21	0.25	−0.26	1.00	
16	Year 1987	0.03	−0.01	0.03	0.03	0.03	0.00	−0.06	0.03	0.02	0.01	0.04	−0.24	−0.28	−0.29	−0.29	1.00

Correlations of 0.10 or higher are statistically significant at the 95% confidence level.

In addition to internal history—i.e., a firm's performance to its prior results—Cyert and March (1963) also describe how decisions may be motivated by comparing performance to peers in the industry. We investigated the possibility that such relative performance would influence new technology adoption in addition to, or instead of, performance improvements compared to the firm's history. Because we found no evidence of a statistically significant relation between relative performance and new technology adoption, we emphasize parsimony and exclude this variable.

Threat of competition

At the time of the study, the threat of competition comes from free, over-the-airwaves TV because exclusive rights to franchised territories had virtually eliminated direct competition from other cable providers (Johnson, 1994). Each firm faced a different level of potential competition because of differences in the local markets served and the wide range of access customers had to free TV. Whereas residents of urban communities could usually receive television signals with a simple antenna, the weakening of television signals at longer distances from cities meant that the viable threat of competition was lower for cable operators located farther away from central cities. Variation also occurred between different cities; smaller cities typically had only two to four free television stations (normally affiliated with ABC, CBS, NBC, and PBS). Larger markets provided channels with all four of these main affiliations plus one or more additional "independent" TV stations. In New York City, the nation's largest market, there were a total of 13 free, over-the-airways stations during the mid-1980s. Markets with more free stations available to viewers posed a greater threat of competition to cable firms.

Conceptually, the threat of competition for cable companies therefore depends on the number of channels a potential cable subscriber could receive using a regular antenna. At the firm level of analysis, we cannot measure this threat directly but we can use industry data to construct an effective firm-level proxy. Given that television stations are assigned to cities based on their population—such that larger cities with higher population density generally have more free stations than smaller cities with lower population density—and that signal strength decreases with distance from those cities, a firm-specific measure of population density can roughly approximate the *threat of competition.* Kagan's yearly reports provide such data, allowing us to calculate a firm-specific average population density across all of a firm's cable systems by dividing the total number of homes in the firm's franchised areas (whether or not they subscribe to cable) by its total number of systems. Table 1 presents this data in thousands; firms range from 370 homes per system to 260,000 homes per system, with a mean value of 33,790 homes per system. (Because of the wide variation on this variable, we also report the median, which equals 14,600 homes per system.)

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Control variables

Our models control for four additional factors that could plausibly influence the percentage of a firm's customers that receive expanded basic cable service. First, we control for *firm size*, which equals a count of the systems owned by each firm, expecting that new technology adoption might be higher in larger firms. This variable ranges from 1 to 564 systems, with an average of 44 systems per firm. Second, we control for *pricing policy*, on the theory that customers already paying a lot for basic service may be reluctant to pay extra for expanded basic stations. Because cable prices rose during the study period, we calculated this measure for each firm relative to the yearly mean price for basic cable service. This measure ranges from $7.79 below the mean to $4.53 above the mean.

Third, we expect the percentage of the firm owned by another cable operator—known in the industry as *cross ownership*—to influence new technology adoption toward mean levels in the industry. This variable ranges from 0 to 100 percent, with a mean value of seven percent. Fourth, we account for *public financing* as the percentage of the firm that is publicly traded, expecting that higher percentages of public financing might provide additional capital that facilitates new technology adoption. This variable also ranges from 0 to 100 percent, with a mean value of eight percent. Finally, we include dummy variables for the years from 1983 to 1987 to account for changes in general operating conditions over time.

Estimation method

With multiple years of data for many cable companies, we employ regression techniques that incorporate time-series estimation capabilities. The panels of data are relatively short (five years or less), which is conducive to a generalized least squares regression (GLS) with a common first-order autoregressive AR(1) and heteroskedastic error structure. Our results confirm a high degree of autocorrelation ($\rho = 0.68$ in the primary model). Because the AR(1) technique requires at least two data points from each firm, we lose a small number of observations from firms that reported only one year of data.

RESULTS

Tables 3–5 present regression results. All models have χ-squared statistics that indicate statistical significance beyond the 99 percent confidence level. Variance inflation factors (VIFs) are all well below the benchmark of 10 (see Table 1). Model 1 on Table 3 presents results for the control and moderating variables. We observe no discernible relationship between firm size and new technology adoption, while the other three control variables have negative and statistically significant relations with new technology adoption. The negative result for pricing policy confirms prior expectations, but the results for cross ownership and public financing might be considered surprising. For cross ownership, the result suggests that firms linked directly to other cable operators had more of a wait-and-see approach rather than leading the charge to provide expanded basic service. A negative coefficient for public financing is more surprising. *Ex post*, we speculate that public financing contributes to stakeholder conflict, thus delaying the adoption of new technology. However, further research will be needed to assess that speculation.

No hypotheses were offered about the main effects of the moderating variables. Unsurprisingly, we observe a positive and statistically significant relationship between performance improvements and new technology adoption. This is consistent with the idea that improved performance generates additional resources that make it easier for firms to make a large infrastructure investment such as upgraded technology. For level of competition, we observe no relationship in Model 1, or any other model until we introduce the hypothesized interaction with family ownership. We are not surprised by this outcome because we theorized that the threat imposed by direct competition has different implications for economic returns and socioemotional wealth. Given a sample with a good mix of family and non-family firms, no relation should be expected until we have accounted for family ownership.

Model 2 (see Table 3) adds the main effect of family ownership as a single variable, enabling us to evaluate H1a. As expected, we find a negative and statistically significant relationship with new technology adoption ($b = -4.62$, $z = -4.26$, $p < 0.001$). In a setting where almost 22 percent of customers had expanded basic service overall, this service was only in the homes of 17 percent of family firm customers. In Model 3 (also on Table 3), we distinguish between minority family ownership and majority family ownership. This model supports H1b, as we find that family ownership is more

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Table 3. Preliminary GLS regression analyses without interaction terms

	Model 1				Model 2				Model 3			
	Control and moderating variables				Adding family ownership in aggregate				Distinguishing minority from controlling family ownership			
DV = new technology adoption	Coef.	SE	z	P > z	Coef.	SE	z	P > z	Coef.	SE	z	P > z
Firm size	0.00	0.01	−0.47	0.635	0.00	0.01	0.35	0.730	0.00	0.01	0.62	0.536
Pricing policy	−2.92	0.43	−6.81	0.000[a]	−3.10	0.46	−6.73	0.000[a]	−3.06	0.46	−6.71	0.000[a]
Cross ownership	−9.42	2.75	−3.43	0.001[a]	−8.65	2.82	−3.07	0.002[a]	−7.30	2.92	−2.50	0.012[b]
Public financing	−7.24	2.63	−2.75	0.006[a]	−9.32	2.78	−3.36	0.001[a]	−8.71	2.97	−2.94	0.003[a]
Performance improvements	0.43	0.11	3.88	0.000[a]	0.43	0.11	3.87	0.000[a]	0.40	0.11	3.52	0.000[a]
Level of competition	0.00	0.02	0.01	0.991	−0.01	0.02	−0.30	0.763	−0.02	0.02	−0.79	0.427
Family ownership					−4.62	1.08	−4.26	0.000[a]				
Family - minority interest									−6.33	1.61	−3.94	0.000[a]
Family - majority interest									−2.73	1.30	−2.11	0.035[b]
Year 1983	−5.08	1.20	−4.23	0.000[a]	−5.54	1.09	−5.10	0.000[a]	−5.24	1.10	−4.76	0.000[a]
Year 1984	−0.81	1.04	−0.78	0.435	−0.81	0.99	−0.82	0.412	−0.45	1.01	−0.45	0.655
Year 1985	−0.01	0.95	−0.01	0.992	−0.21	0.93	−0.22	0.825	0.16	0.95	0.17	0.865
Year 1986	2.06	0.70	2.96	0.003[a]	2.08	0.70	2.95	0.003[a]	2.18	0.70	3.10	0.002[a]
Year 1987		(Omitted)				(Omitted)				(Omitted)		
Constant term	22.31	1.02	21.80	0.000[a]	24.88	1.15	21.65	0.000[a]	24.39	1.21	20.11	0.000[a]
AR(1) coefficient	0.73				0.68				0.69			
chi-squared	130.59	0.000	10	df	184.74	0.000	11	df	169.15	0.000	12	df

[a] Statistically significant at the 99% confidence level.
[b] Statistically significant at the 95% confidence level.
SE = standard error.
N = 321 observations from 79 firms.

negatively related to new technology adoption when the family has a minority stake ($b = -6.33$, $z = -3.94$, $p < 0.001$) than when the family has a majority position ($b = 2.73$, $z = -2.11$, $p < 0.05$). Substantively, this implies that almost 19 percent of customers in majority family firms had expanded basic service, compared to just over 15 percent of customers when families held a minority stake.

Tables 4 and 5 account for differences in the moderating variables. For completeness, each table presents a set of three models, but we focus our interpretation on the full model that appears at the right-hand side of each set. H2a and H3a compare family firms to non-family firms, the results of which are presented on Table 4. On Table 5, we analyze interactions between the moderating variables and the minority vs. majority levels of family ownership. (Note that an accurate calculation of these variables' marginal effects requires the addition of the associated main effects, which we have provided toward the bottom of each table.)

We find support for H2a, which argues that performance improvements motivate new technology adoption more in non-family firms than in family firms. In non-family firms, each one percent increase in revenue was associated with a 0.93 percent increase in the percentage of customers with expanded basic service, with strong statistical significance ($b = 0.93$, $z = 4.50$, $p < 0.001$; see Model 6). For family firms, the predicted new technology adoption for each one percent revenue gain is 0.49 percent smaller than in non-family firms ($b = -0.49$, $z = -2.18$, $p < 0.05$). As a result, the impact of revenue increases on new technology adoption is 0.44 percent in family firms, less than half the impact observed in non-family firms.

Table 5 distinguishes between minority family ownership and majority family ownership, and interacts both of these dummy variables with the moderating variables, enabling evaluation of H2b. Interpretation requires a two-sample t-test with pooled standard errors to determine whether these coefficients are different from each other. As shown toward the bottom of Table 5, H2b receives support, as new technology adoption in firms with minority family ownership does not increase in response to revenue increases at the level observed in firms with majority family ownership

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Table 4. GLS regression analyses with dichotomous family measure

	Model 4				Model 5				Model 6			
	Interacting family w/ performance improvements				Interacting family w/level of competition				Full model with single Family variable			
DV = new technology adoption	Coef.	SE	z	P > z	Coef.	SE	z	P > z	Coef.	SE	z	P > z
Firm size	0.00	0.01	0.06	0.952	0.00	0.01	0.72	0.469	0.00	0.01	0.66	0.512
Pricing policy	−3.35	0.47	−7.10	0.000[a]	−3.81	0.48	−7.97	0.000[a]	−3.84	0.47	−8.10	0.000[a]
Cross ownership	−8.12	2.89	−2.81	0.005[a]	−7.39	3.01	−2.45	0.014[b]	−7.54	3.17	−2.38	0.018[b]
Public financing	−10.44	2.72	−3.84	0.000[a]	−11.06	2.94	−3.77	0.000[a]	−11.81	2.96	−4.00	0.000[a]
Performance improvements	0.97	0.21	4.57	0.000[a]	0.54	0.11	5.08	0.000[a]	0.93	0.21	4.50	0.000[a]
Level of competition	−0.01	0.02	−0.44	0.662	−0.09	0.03	−3.52	0.000[a]	−0.09	0.03	−3.42	0.001[a]
Family ownership	−2.84	1.08	−2.62	0.009[a]	−6.05	1.14	−5.30	0.000[a]	−5.01	1.21	−4.14	0.000[a]
Family × Performance improvements	−0.66	0.24	−2.75	0.006[a]					−0.49	0.22	−2.18	0.029[b]
Family × Level of competition					0.15	0.04	4.09	0.000[a]	0.15	0.04	3.95	0.000[a]
Year 1983	−6.11	1.10	−5.54	0.000[a]	−6.74	1.12	−6.04	0.000[a]	−6.47	1.10	−5.86	0.000[a]
Year 1984	−1.68	0.95	−1.78	0.076[c]	−2.25	0.92	−2.43	0.015[b]	−2.28	0.87	−2.61	0.009[a]
Year 1985	−0.81	0.87	−0.93	0.352	−1.09	0.86	−1.26	0.207	−1.21	0.80	−1.50	0.134
Year 1986	1.51	0.60	2.51	0.012[b]	1.58	0.75	2.12	0.034[b]	1.75	0.71	2.45	0.014[b]
Year 1987		(Omitted)				(Omitted)				(Omitted)		
Constant	24.11	0.97	24.80	0.000[a]	26.31	1.26	20.96	0.000[a]	25.60	1.28	20.00	0.000[a]
Marginal effects												
H2a: Coefficient for performance improvements in family firms									0.44			
H3a: Coefficient for level of competition in family firms									0.06			
Chi-squared	175.72	0.000	12	df	308.91	0.000	12	df	362.04	0.000	13	df

[a] Statistically significant at the 99% confidence level.
[b] Statistically significant at the 95% confidence level.
[c] Statistically significant at the 90% confidence level.
SE = standard error.
N = 321 observations from 79 firms.

(difference = -0.64, $z = -2.14$, $p < 0.05$; based on Model 9). Figure 1 illustrates how the predicted technology adoption is highest for non-family firms across the board, with a wider gap relative to both minority and majority family firms at higher levels of performance. Holding control variables constant at mean levels, predicted technology adoption in non-family firms increases 12.3 percentage points—from 19.9 percent when performance improvement is one standard deviation below the mean to 32.2 percent when performance improvement is one standard deviation above the mean. In comparison, majority family firms increase by 9.4 percentage points over this range (from 17.3% to 26.7%), while minority family firms increase by only 5.4 percentage points (from 14.4% to 19.8%).

H3a argues that the level of competition will motivate higher adoption of new technology among family firms compared to non-family firms. Model 6 provides support for this hypothesis ($b = 0.15$, $z = 3.95$, $p < 0.001$). This coefficient represents the difference between family and non-family firms; Model 6 shows that non-family firms become less likely to adopt new technology when facing higher levels of competition ($b = -0.09$, $z = -3.42$, $p < 0.01$), whereas family firms are more likely to do so. Specifically, a 1,000-homes per system increase in population density is associated with an increase in new technology adoption of six percentage points.

In H3b, we argued that this effect would be greater in firms with majority family ownership than firms with minority family ownership. We do not find support for this hypothesis; in fact, the evidence supports the opposite conclusion, albeit at a marginal level of statistical significance (*difference* = 0.08, $z = 1.65$, $p < 0.10$). The threat of competition appears to motivate an interest in new technology adoption to a greater extent when families have only a minority stake in the firm.

Figure 2 shows that at relatively low levels of competition from free TV (i.e., one standard deviation below the mean), new technology adoption diverges widely across the three types of firms—with non-family firms at 26.8 percent, majority family firms at 18.9 percent, and minority

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Table 5. GLS regression analyses distinguishing between minority family ownership and majority family ownership

	Model 7				Model 8				Model 9			
	Interacting minority and majority w/performance improvements				Interacting minority and majority w/level of competition				Full model distinguishing between minority and majority			
DV = new technology adoption	Coef.	SE	z	P > z	Coef.	SE	z	P > z	Coef.	SE	z	P > z
Firm size	0.00	0.01	0.35	0.723	0.01	0.01	1.03	0.305	0.01	0.01	1.86	0.063[c]
Pricing policy	−3.13	0.47	−6.70	0.000[a]	−3.30	0.49	−6.73	0.000[a]	−4.47	0.50	−9.01	0.000[a]
Cross ownership	−7.42	3.13	−2.37	0.018[b]	−6.24	3.47	−1.80	0.073[c]	−3.79	3.03	−1.25	0.210
Public financing	−9.88	3.05	−3.24	0.001[a]	−8.33	3.43	−2.43	0.015[b]	−12.44	2.92	−4.26	0.000[a]
Perf. Improvements	0.89	0.21	4.30	0.000[a]	0.46	0.11	4.24	0.000[a]	0.98	0.23	4.26	0.000[a]
Level of competition	−0.02	0.02	−0.77	0.443	−0.06	0.03	−2.34	0.019[b]	−0.10	0.02	−4.24	0.000[a]
Family - minority interest	−4.40	1.80	−2.44	0.015[b]	−7.64	2.32	−3.29	0.001[a]	−7.30	2.03	−3.59	0.000[a]
Family - majority interest	−1.52	1.26	−1.20	0.229	−4.36	1.62	−2.70	0.007[a]	−3.39	1.42	−2.39	0.017[b]
Minority × perf. improve	−0.94	0.29	−3.21	0.001[a]					−1.11	0.32	−3.51	0.000[a]
Majority × perf. improve	−0.48	0.25	−1.94	0.052[c]					−0.47	0.29	−1.63	0.103
Minority × level comp.					0.15	0.05	3.01	0.003[a]	0.20	0.05	4.23	0.000[a]
Majority × level comp.					0.08	0.05	1.45	0.147	0.12	0.05	2.36	0.018[b]
Year 1983	−5.78	1.10	−5.26	0.000[a]	−5.78	1.24	−4.67	0.000[a]	−5.44	1.33	−4.08	0.000[a]
Year 1984	−1.05	0.96	−1.09	0.275	−1.30	1.09	−1.19	0.235	−0.63	1.19	−0.53	0.594
Year 1985	−0.32	0.90	−0.36	0.720	−0.46	0.99	−0.47	0.641	0.71	1.17	0.61	0.544
Year 1986	1.59	0.60	2.66	0.008[a]	1.90	0.73	2.60	0.009[a]	2.49	0.93	2.67	0.008[a]
Year 1987		(Omitted)				(Omitted)				(Omitted)		
Constant	23.86	1.07	22.36	0.000[a]	24.55	1.49	16.49	0.000[a]	23.75	1.36	17.50	0.000[a]
Marginal effects and two-sample T-tests												
Coefficient for performance improvements in family firms - minority interest									−0.13			
Coefficient for performance improvements in family firms - majority interest									0.50			
H2b: Difference									−0.64	0.30	−2.14	0.033[b]
Coefficient for level of competition in family firms - minority interest									0.10			
Coefficient for level of competition in family firms - majority interest									0.02			
H3b: difference									0.08	0.05	1.65	0.099[c]
AR(1) coefficient	0.72				0.75				0.56			
Chi-squared	159.57	0.000	14	df	154.19	0.000	14	df	312.91	0.000	16	df

[a] Statistically significant at the 99% confidence level.
[b] Statistically significant at the 95% confidence level.
[c] Statistically significant at the 90% confidence level.
SE = standard error.
N = 321 observations from 79 firms.

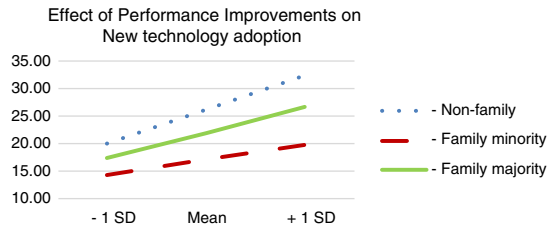

Figure 1. Predicted new technology adoption (%). Moderating effect of Performance Improvements for different types of Family Ownership

family firms at 11.9 percent. However, these levels converge as the threat of competition increases, and at one standard deviation above the mean, both minority family (20.8%) and majority family firms (20.7%) having higher predicted technology adoption than non-family firms (18.2%). The drastic change observed for family minority firms can be interpreted as evidence that under competitive conditions, mixed ownership can act swiftly and decisively as owners attempt to coalesce against a clear competitive threat.

Robustness checks

We examine the robustness of this model in multiple ways. First, we estimated results without including the year dummy variables. Results were consistent with those reported above, with higher z-values on the variables of interest. Second, we calculated panel-specific autoregressive error terms instead of

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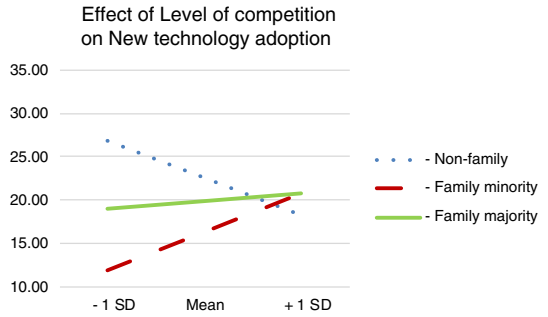

Figure 2. Predicted new technology adoption (%). Moderating effect of Level of Competition for different types of Family Ownership

a single autoregressive term for the entire regression. At the cost of reduced model efficiency, the coefficient estimates from this robustness check are also similar to the reported results, again with higher z-values because the panel-specific autoregressive terms further reduce measurement noise.

DISCUSSION

One purpose of this paper is to explore the subtle differences in new technology adoption of family firms versus non-family firms. However, our more novel contribution is to theorize about differences in majority versus minority family firms. A robust literature has developed exploring the similarities and differences between family firms and non-family firms in terms of governance and strategic approach (Gomez-Mejia *et al.,* 2007, 2011). This literature proposes that, in addition to economic welfare, family firms consider socioemotional wealth in their decision processes and choices. Nevertheless, because all firms share an economic imperative, these differences are nuanced and, some might expect, would erode in minority family firms as ownership control becomes diluted.

Our first over-arching hypothesis was that family firms would be less likely to adopt new technology than would non-family firms. The core reasoning, supported in our data (H1a), was that whereas the potential economic benefit and risks would be equivalent for family and non-family firms, the potential loss of socioemotional wealth from adopting new technology would also be considered by family firms and tend to inhibit such adoption on their part. We subsequently argued that certain contingencies would influence this tendency. From an internal perspective, recent performance improvements (while reducing the risk of financial loss for all firms adopting technology) would have less impact in family firms where socioemotional wealth objectives might supersede technology investments. As predicted, we found that the increase in new technology adoption was weaker in family firms than in non-family firms as recent performance increased (H2a). Finally, as predicted, we found that in the face of increasing competition, family firms (perhaps fearing loss of both socioemotional and economic income) were relatively more inclined to adopt new technology (H3a).

We now reflect on the contrast between minority and majority family firms relative to non-family firms. If we assumed that the "family-ness" in decision making exists along a continuum from 0 to 100 percent family ownership, then we might expect minority family firms to have greater similarity with non-family firms than majority family firms. However, we reasoned that, in general, minority family firms would act least like non-family firms because of "fear and friction" within such firms, as the family "hold" on identity and decision authority would be more tenuous than in majority family firms. Consistent with this idea, we found that minority family firms were more strongly resistant to new technology adoption (H1b). This finding enhances our understanding of socioemotional wealth by challenging the prevailing presumption that it is positively correlated with the level of family influence. Our work suggests that, at least in some situations, considerations of socioemotional wealth take on greater salience when families hold minority rather than majority stakes. Such a challenge to traditional notions of family-ness can also be seen in recent work addressing the tension between the generally conservative portrayal of family firms and evidence that family firms are often quite innovative (Duran *et al.,* 2016).

Using a similar logic in H2b, we predicted that upswings in performance would have a greater positive effect on the propensity to adopt new technology in majority-controlled than in minority family firms. Greater resources available from better performance reduce the economic threat of making the risky choice of technology adoption, which might induce majority family firms to make this choice. However, these additional resources do not reduce the threat to socioemotional wealth in the form of erosion of identity and family influence, and such

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fear of loss looms larger for minority family firms that lack the ability to impose family control.

Finally, in H3b we had argued that a competitive threat would have a stronger positive impact on new technology adoption in majority-controlled family firms than in minority ones. Both types of family firms would be motivated to take risks to save the firm, but majority family firms would have greater power to force such decisions on the firm than would minority family firms, resulting in a higher positive impact of competition in majority family firms. This hypothesis was not supported; in fact, the result was borderline significant in the opposite direction. The other two types of firms also have new technology adoption of approximately 20 percent at high levels of competition, but diverge widely from each other at low levels of competition.

We pause to reflect on this initially surprising result. Figure 2 shows that under conditions of increasing competition, non-family firms dramatically reduce their propensity to invest in new technology adoption. One interpretation might be that managers in such firms are unwilling to risk further economic costs in an eroding competitive landscape. Family firms appear to react quite differently. We had predicted that majority family firms, under the threat of both economic and socioemotional wealth loss, would increase their adoption more than would minority family firms. However, level of competition appears to have little effect in these firms, as new technology adoption is close to 20 percent for most levels of competition. Instead, the greater change toward technology adoption occurs in minority family firms. The overall pattern reveals that at high levels of competition, non-family firms, majority-controlled, and minority-controlled family firms *converge* in their propensity to adopt new technology. Perhaps severe competition drives the three types of firms to be more like one another than they are in other situations. Our work fits with a recent call to study the impact of goal conflict on shaping a firm's reference point for risk-taking behavior (Hoskisson *et al.,* forthcoming). Internal goal conflict may shift the reference point, but the threat of competition supersedes those conflicts toward a more consistent reference point which results in similar behavior across firms.

Whereas we did not hypothesize the effect in H3b, for minority family firms our results are consistent with a loss-framing logic (Gomez-Mejia *et al.,* 2007, 2011). Interestingly, whereas Gomez-Mejia and his colleagues essentially show that family firms are prone to take fewer venturing risks than non-family firms in loss framing situations, our results suggest a more nuanced interpretation. Specifically, Figure 2 indicates that when competitive threats are high (a situation which is analogous to a loss framing condition, or alternatively, a greater threat situation), the majority family firms do take marginally greater risks. Yet it is the minority family firms that dramatically increase their technology adoption propensity, or "go for broke." It may be that the imminence of losing their already-small influence induces them to engage in riskier behavior. Alternatively, they may believe that *not* adopting new technology poses the greater risk to their tenuous hold on socioemotional wealth in the firm.

The internal contingency paints a different picture, as the results in Figure 1 suggest the three types of firms *diverge* in their choices of technology adoption as performance improves and more resources become available. It appears as though family firms prefer a more conservative approach, especially when having only minority influence. Similarly, Gomez-Mejia *et al.* (2007) find that although both family and non-family firms take more venturing risks the farther they are from target levels, family firms are less risk-taking. From a gain framing perspective (since performance improvements may be construed as gain framing), it appears that both non-family and majority family firms are *more* rather than less likely to take risk.

Looking at the results for non-family firms across the two conditions (and the two Figures), we note that the change in risk-taking propensity across the two conditions is greatest for non-family firms, relative to either majority family firms or minority family firms. In particular, non-family firms appear to be extremely risk-taking in gain situations, but risk avoiding when competitively threatened. Such behavior runs counter to the standard risk prospect theory formulation of lower risk taking under gains and greater risk taking under expected losses. We speculate that in the competitive threat situation, non-family firms exhibit a "threat rigidity" effect (Staw, Sandelands, and Dutton, 1981).

Our work further suggests that socioemotional wealth is a utility that family owners not only want to preserve, but also want to shape and grow. Minority family owners appear to fight tenaciously to preserve socioemotional wealth while

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majority family owners may be able to take a more balanced approach to grow socioemotional wealth. Our principal contribution, in showing that family firms are not monolithic but rather differ significantly in terms of their risk-taking behavior, may be linked to recent calls for distinguishing between dimensions of socioemotional wealth (Gomez-Mejia *et al.,* 2011). For example, minority family owners may work to preserve certain dimensions (e.g., values, culture, routines) while majority family owners may focus on growing other dimensions (e.g., control, influence, networks, dynasty) of socioemotional wealth. Future research should examine the interaction of these facets of socioemotional wealth to provide a more nuanced understanding of this construct and its impact on decision-making.

Another implication from our work is that in distinguishing between the "fear and friction"-motivated behavior of the minority family firms and the more balanced approach to growing socioemotional wealth in majority family firms may induce an interesting dynamic as the ownership control approaches 50 percent. It would be interesting to study the dynamics of family behavior in such firms in terms of whether and how ownership groups fight to preserve their control. Although we have data around this value, the number of firms in our data are too small to draw meaningful conclusions. We also note that minority family ownership creates a situation that represents a special case of principal-principal conflicts (Young *et al.,* 2008), and we see strong potential for future integration of research on this subject with the family firm domain[4].

From a managerial perspective, our findings on the behavior of minority family firms suggests that smaller blockholders with divergent goals, such as the preservation of socioemotional wealth, may delay strategic decision-making because they tend to fight hard to preserve their tenuous hold on the firm's influence. Clearly, this may have negative effects on innovation and new technology adoption in minority family firms. Our work also suggests that comprehensive decision processes that examine more than just economic outcomes might appeal to minority family owners, along the same lines as incorporating stakeholder analysis into strategic decision-making.

[4] We wish to credit an anonymous reviewer for calling our attention to this connection.

Limitations and future directions

To isolate a discrete investment—new technology adoption—we limited our study to one industry, which may have imposed limitations. First, there may be a concern that conditions in the cable industry do not make the result generalizable to other industries. We were able to use the industry's structure and data availability to observe new technology adoption and the level of competition, but both measures are unique to this industry and may not represent all industries adequately. Additional research in a broader research setting would be valuable for confirming our findings, and would enable the inclusion of industry-level contingencies as well as the firm-level contingencies we modeled here. Likewise, we recognize that most industries feature more complex competitive structures. The simplicity of cable's competitive landscape helped facilitate this initial inquiry into the effect of competition on minority and majority family firms, respectively, but we see considerable value in future research that captures more nuanced competitive dynamics.

CONCLUSION

Socioemotional wealth has been strongly established in the literature on family firms. We use the logic of socioemotional wealth to compare the likelihood of adopting new technology by family vs. non-family firms. In addition, we theorize and demonstrate a further contrast between two types of family firms, based on minority vs. majority ownership interests. Our results provide support for our theory that the control embedded in majority family firms makes it easier to undertake risky decisions such as new technology adoption. This suggests greater nuance to the construct of socioemotional wealth than previously understood, and implies that future research may uncover additional interesting nuances to this important construct.

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