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Simulating Dynamic Capabilities and Value Creation in Family Firms: Is Paternalism an "Asset" or a "Liability"?

Francesco Chirico[1], Mattias Nordqvist[1], Gianluca Colombo[2], and Edoardo Mollona[3]

Abstract

The authors conduct a simulation study using system dynamics methods to interpret how and when paternalism affects dynamic capabilities (DCs) and by association value creation in family firms. Their simulation experiments suggest that the effect of paternalism on DCs and value creation varies over time. Initially, increasing levels of family social capital and low levels of paternalism are associated with high rates of DCs and value creation accumulation (*asset*). Later, higher levels of paternalism produce their pressure to decrease DCs, value creation, and family social capital accumulation rates (*liability*).

Keywords

dynamic capabilities, value creation, paternalism, simulation, system dynamics, family social capital

Discovering the determinants of a firm's ability to create value in terms of financial results in a competitive environment is central to the strategic management field. This is specifically relevant in private family firms in which the *firm*'s survival across generations is a primary concern for the *family*'s well-being. Therefore, it is not surprising that family firm research is increasingly focused on factors of competitive advantage and family firms' value-creating potential (e.g., Carney, 2005; Chirico, Ireland, & Sirmon, 2010; Chirico, Sirmon, Sciascia, & Mazzola, in press; Sirmon & Hitt, 2003). The resource-based view of the firm is a useful framework for studying the sources of value creation. The resource-based view emphasizes the bundles of unique, valuable, rare, inimitable, and nonsubstitutable resources that are at the firm's disposal as the foundation for value creation (Barney, 1991). However, possessing resources alone does not automatically lead to value creation. Rather, the firm's resources must be managed to create value (Sirmon & Hitt, 2003; Sirmon, Hitt, & Ireland, 2007). Accordingly, Eisenhardt and Martin (2000) suggest that new value-creating strategies are generated by the recombination process of resources. This is captured in the concept of dynamic capabilities (DCs), through which entrepreneurial change is promoted and new value is created in organizations over time (Teece, Pisano, & Shuen, 1997).

It is important to understand the determinants—both positive and negative—of value creation in family firms because private family firms are the most common forms of organization throughout the world and thus play a large role in the world's economies (Colli, 2003). Family firm research has observed the influence of organizational culture on either promoting or constraining DCs and value creation (see, e.g., Chirico & Nordqvist, 2010; Hall, Melin, & Nordqvist, 2001; Zahra, Hayton, &

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Salvato, 2004). Seeking to extend this literature, our first research question is the following: *How and when does paternalism affect DCs and by association value creation in family firms?* Paternalism is the practice of excessively caring for others so as to interfere with their decisions and autonomy thus often producing resistance to change. Existing literature tend to depict paternalism as a simple dichotomy between benevolent and authoritarian behaviors whose results are often contradicting (for a review, see Pellegrini & Scandura, 2008).

The family firm is an important context for studying the role of paternalism and addressing the previously contradicting results, because paternalism has been repeatedly observed as a common feature of the family firm culture (e.g., Dyer, 1986, 1988; Johannisson & Huse, 2000), but its effect on value creation has been rarely examined. Drawing on previous exploratory case-based research (Hall et al., 2001; Salvato & Melin, 2008), we offer, as a further step in the development of knowledge in this area, a system dynamics approach that relies on simulation experiments to generate testable propositions. Thus, our second research question is the following: *How can simulation experiments shed light on complex decision processes in family firms?*

In line with the two research questions, we aim to make conceptual and methodological contributions primarily to the field of family business research. *First*, the article sheds light on the circumstances under which paternalism is an asset or liability for family firms through its impact on DCs and value creation. *Second*, the article offers insights with regard to how systems dynamics and simulation experiments in a computer-based virtual laboratory (see Davis, Bingham, & Eisenhardt, 2007; Harrison, Lin, Carroll, & Carley, 2007) can be used to study the important decision making processes and outcomes in family firms. Although this article focuses on family firms, we suggest that our conceptual and methodological approach may be applied to other types of organizations that are characterized by a dominant social group—that is, any group possessing its own institutionalized practices, values, and behavioral norms.

Theoretical Background

Dynamic Capabilities and the Family Firm

Eisenhardt and Martin (2000) suggest that new value-creating strategies are generated by the recombination process of resources, that is, entrepreneurial activities designed to acquire, exchange, transform, and at times shed resources (see also Dess, Lumpkin, & McGee, 1999). This is captured in the notion of DCs through which change is promoted and new value is created in organizations over time. Examples of DCs are "product development, alliance formation, and strategic decision making that create value for firms within dynamic markets by manipulating resources into new value-creating strategies" (Eisenhardt & Martin, 2000, p. 1106). Accordingly, DCs are often depicted as learned and stable patterns of collective activity, which materialize from social ties between individuals, that is, through social capital (Nahapiet & Ghoshal, 1998). They result from mechanisms of knowledge sharing, collective learning, experience accumulation, and transfer through which resources are recombined (Zollo & Winter, 2002). This approach to resource recombination closely resembles the Schumpeterian view of resource configuration whereby entrepreneurial development is defined as "the carrying out of new combinations" (Schumpeter, 1934, p. 66).

However, to realize the potential value of DCs, a governance form characterized by close social ties that effectively guides the bundling and deployment of resources is needed. Sirmon and colleagues (Arregle, Hitt, Sirmon, & Very, 2007; Chirico et al., in press; Chirico, Ireland, & Sirmon, 2010; Sirmon & Hitt, 2003) suggest that the family firm—which exists when a family possesses significant ownership stake in the firm and has multiple family members involved in its operations (Sirmon, Arregle, Hitt, & Webb, 2008)—is a governance form that may enable such actions. In family firms, family members indeed develop strong and durable relations through kinship ties. Accordingly, emotional attachment and rational judgment are inseparably intertwined, thereby significantly affecting their strategic behaviors (Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, & Moyano-Fuentes, 2007; Sirmon & Hitt, 2003).

A Feedback View of Family Social Capital, Dynamic Capabilities, and Value Creation

The concept of social capital is central to the understanding of DCs and value creation. Arregle et al. (2007, p. 75) define social capital as "the relationships between individuals . . . that facilitate action and create value."

Given that DCs emerge from repeated interactions between individuals and can be better developed by close-knit groups who identify themselves with a larger collective (Kogut & Zander, 1992), family firms are an interesting organizational form for studying DCs (Salvato & Melin, 2008). The interaction of the family and the business enables family members to act simultaneously within both social systems, thus creating a specific context for resource recombination (Sirmon & Hitt, 2003). Family firms are indeed characterized by socially close relations among family members (i.e., family social capital; see Salvato & Melin, 2008), which also occur informally outside the work context. These relations are developed through a history of interactions and mutual trust that makes it less likely to discredit each other's ideas and perspectives. The family firm structure, based on close interaction of kinship ties and reciprocal trust (Stewart, 2003), encourages the existence of strong family relations, which in turn enable family members to easily integrate their individual specialized knowledge to promote action.

Arregle et al. (2007) suggest that family social capital is one of the most lasting and influential forms of social capital given that stability, interdependence, interaction, and closure (Nahapiet & Ghoshal, 1998) are very strong in family firms. Additionally, "[A] common system of meanings is usually strongly developed between family members, thereby allowing them to discuss and exchange information easily and to perform specific tasks or activities efficiently and rapidly through predictable patterns of collective behavior" (Chirico & Salvato, 2008, p. 175; Granata & Chirico, 2010). Indeed, a "family language" allows family members "to exchange more information with greater privacy and arrive at decisions more rapidly than can two nonrelatives" (Tagiuri & Davis, 1996, pp. 204-205).

According to this logic, high levels of family social capital based on trust and benevolence between family members promote the evolution of capabilities in the family firm as well as its ability to recombine resources and respond appropriately to environmental changes. In other words, high levels of family social capital should support the family firm to generate new value over time. For instance, Salvato and Melin (2008) suggest that family firms' ability to create value over time "can be understood by considering how family-related social capital differentially affects processes of resource access, creation, and recombination, which in turn yield different strategic initiatives along the exploration/exploitation continuum" (p. 264). In turn, stronger value creation over time may reduce family conflicts and promote family harmony—in terms of sense of unity and connections among family members—thus further sustaining the positive role of family social ties on the family firm's development (Eddleston, Kellermanns, & Zellweger, 2010). However, previous studies have indicated that family firms also face challenges to keep the long-term positive relationship between family social capital, DCs, and value creation (Salvato, Chirico, & Sharma, 2010). We argue that one important challenge is associated with paternalism, that is a common but poorly understood cultural feature of private family firms (Dyer, 1986, 1988; Johannisson & Huse, 2000).

Paternalism: "Asset" or "Liability"?

Paternalism is the practice of (excessively) caring for others so as to interfere with their decisions and autonomy (Pellegrini & Scandura, 2008). In an organizational context, paternalism is about being protective and dominating in a fatherly way with a strong attitude of wanting to preserve the firm's traditions and not make changes. In particular, paternalism is prevalent in cultures that value collectivism (Gelfand, Erez, & Aycan, 2007) in which each member views himself or herself as part of "a larger (family or social) group [focusing on 'we'], rather than as an isolated independent being [focusing on 'I']" (Hofstede, 2001; VandenBos, 2007, p. 195).

Family firms tend to be more collectivistic than individualistic based on the extent to which they stress stability, interdependence, interaction, and conformity to cultural family traditions (Sharma & Manikutty, 2005; Zahra et al., 2004). These characteristics and the fact that parent–child work relationships are extensive in family firms make paternalism a common cultural feature of family firms (Chirico & Nordqvist, 2010; Dyer, 1986, 1988; Johannisson & Huse, 2000).

Recent research defines paternalism as "a style that combines strong . . . authority with fatherly benevolence" (Farh & Cheng, 2000, p. 94; see also Farh, Cheng, Chou, & Chu, 2006). Specifically, *benevolence* refers to leader behaviors that demonstrate individualized, holistic concern for subordinates' personal and family well-being (Pellegrini & Scandura, 2008). Accordingly, paternalistic individuals provide support, protection,

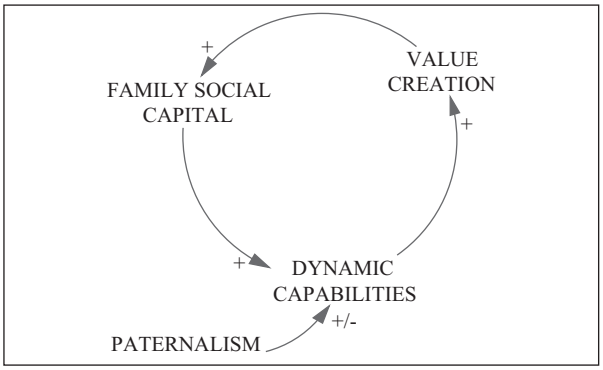


Figure 1. A feedback view
Note. The "+" means that the two variables move in the same direction, all other things being equal. The "−" means that the two variables move in opposite directions, all other things being equal.

and care to their subordinates (e.g., Redding, Norman, & Schlander, 1994) who willingly reciprocate the care and protection of paternal authority by showing conformity (Pellegrini & Scandura, 2006). For instance, Westwood and Chan (1992) depict paternalism as a father-like behavior in which authority is combined with concern and considerateness that promote firm performance (see also Lim, Lubatkin, & Wiseman, 2010, pp. 206-207).

Authoritarianism refers instead to leader behaviors that assert authority and control and demand unquestioning obedience from subordinates (e.g., Uhl-Bien & Maslyn, 2005). Accordingly, relationships between parties are based on control and exploitation, and subordinates show conformity solely to avoid punishment. In such a situation, the paternalistic leader tends to deny her or his subordinates any responsibility and the freedom to express ideas and make autonomous choices and changes, thus promoting organizational inertia (Dyer, 1986). In fact, although the parent is presumed to have genuine benevolent intentions toward her or his offspring, she or he may exercise absolute authority over them (Jackman, 1994) that stifles the recombination of resources and value creation.

Accordingly, scholars still debate whether paternalism is a cultural "asset" or "liability" for an organization's success. Pellegrini and Scandura (2006) see paternalism as an "effective strategy" (p. 268), whereas Uhl-Bien and Maslyn (2005) refer to paternalism as "problematic and undesirable" (p. 1). We seek to advance this debate and understand if and when a culture that exhibits paternalism fosters (asset) or hinders (liability) the family firm social capital, DCs, and value creation over time.

We suggest that the four central constructs we have discussed here—family social capital, DCs, value creation, and paternalism—are intertwined by cause–effect relationships with a feedback nature. This means that over time they may not necessarily generate positive outcomes. To fully appreciate the dynamics implications of feedback links among these constructs, we develop a computer-aided formal analysis capable of teasing out testable propositions. The feedback loop diagram reported in Figure 1 summarizes the feedback causal structures that we have outlined. In Figure 1, the arrows indicate the presence of a causal connection between pairs of variables, and the signs next to the arrows specify the possible nature of the causal relationships (positive, negative, or both) between connected variables (Sterman, 2000).

Method

Simulation

Simulation, defined as a virtual experiment that uses computer software to model the operation of "real-world" processes, systems, or events (Carley, 2001; Law & Kelton, 1991), is an increasingly significant methodological approach in the literature on strategic management and organization theory (Davis et al., 2007; Larsen & Lomi, 2002; Lomi, Larsen, & Freeman, 2005; Lomi, Larsen, & Wezel, 2010; Sastry, 1997; Zott, 2003). In particular, simulation involves creating computational representations (as a set of equations) of the underlying theoretical logic that links constructs together within a simplified world (Fioresi & Mollona, 2010; Mollona, 2010). These representations are then coded into software, through computational algorithms, that is run repeatedly for multiple time periods and under varying experimental conditions to explore the outcomes of interest (Davis et al., 2007; Harrison et al., 2007; Mollona & Marcozzi, 2009a). Simulation allows scholars to make assumptions explicit, control/varying variables, consider multiple chronological and historical paths over an extended period of time (Lomi et al., 2005; Lomi et al., 2010; Mollona & Hales, 2006; Mollona & Marcozzi, 2009b). Harrison et al. (2007) explain that the objective of a simulation "is to construct

a model based on a simplified abstraction of a system—guided by the purpose of the simulation study—that retains the key elements of the relevant processes without unduly complicating the model" (pp. 1240-1241).

Several influential research efforts (e.g., Cohen, March, & Olsen, 1972; March, 1991) have used simulation as their primary method. Some scholars argue that simulation methods contribute effectively to theory development. For example, simulation can provide superior insight into complex theoretical relationships among constructs. In fact, simulation can clearly reveal the outcomes of the interactions among multiple underlying organizational and strategic processes, especially as they unfold over time. In this respect, Hanneman, Collins, and Mordt (1995) posit that "we do not really know what a theory is saying about the world until we have experimented with it as a dynamic [simulation] model" (p. 3). From these perspectives, simulation can be a powerful method for sharply specifying and extending extant theory in useful ways and thus generate new—often counterintuitive—propositions or hypotheses[1] (Lomi et al., 2005; Lomi et al., 2010; Mollona, 2010).

Why Use Simulation?

The longitudinal and feedback nature of the theoretical framework presented in Figure 1 makes deriving its implications fairly complicated. It is not intuitive how the processes that underpin the feedback model in Figure 1 unfold over time to yield different organizational outcomes. In this line, in our study, we relied on simulation rather than on direct data analysis for three reasons.

First, as Larsen and Lomi (1999) explain "[T]he statistical machinery used in empirical research is functional to what we can call -a single-proposition approach to the study of organizations" (p. 412). In other words, statistical methods often do not enable scholars to study the constructs of interest simultaneously. Researchers are forced to examine the effects of some variables to others instantly with a clear distinction between dependent and independent variables and without considering time delays that characterize economic and social relations (Larsen & Lomi, 1999; Lomi et al., 2005; Lomi et al., 2010). For this reason, simulation is particularly useful for the present study. Indeed, our theoretical model involves interacting processes, time delays, and feedback loops. Long-term effects that are difficult to uncover using other methods can emerge so as to explore and extend existing theories (Rivkin, 2000; Rudolph & Repenning, 2002).

Second, simulation methods enable analyses across a broad variety of conditions by merely varying the computer codes (Bruderer & Singh, 1996; Davis et al., 2007; Larsen & Lomi, 1999; 2002; Lomi et al., 2005; Zott, 2003). Such adjustments are usually challenging in empirical research, particularly after the data are collected. Indeed, simulation creates a computational laboratory in which researchers can systematically experiment (e.g., unpack constructs, relax assumptions, vary construct values, add new features) in a controlled setting to produce new theoretical insights. This experimentation is particularly valuable when the theory seeks to explain longitudinal and processual phenomena that are challenging to study using statistical methods because of data limitations such as in our case (Zott, 2003). In fact, paternalism has been studied in a family firm context, but its evolutionary path within and across generations has not been fully explored because of data limitation.

Finally, another important strength of simulation research in general and specifically for our study is internal validity (Campbell & Stanley, 1966). Creating a computational representation involves the precise specification of constructs, assumptions, and the theoretical logic that is enforced through the discipline of algorithmic representation in software (Abelson, Sussman, & Sussman, 1996). Also, simulation eliminates the measurement errors associated with empirical data (Campbell & Fiske, 1959).

System Dynamics

Several well-known simulation approaches have been used in the organization and strategy literature. A well-known and largely used simulation method is system dynamics (Lomi et al., 2005; Lomi et al., 2010; Mollona, 2010; Rudolph & Repenning, 2002). System dynamics focuses on how causal relationships among constructs can influence the behavior of a system over time (Forrester, 1961; Sastry, 1997). The approach typically models a system (e.g., organization) as a series of simple processes with circular causality (e.g., variable X influences variable Y, which in turns influences variable

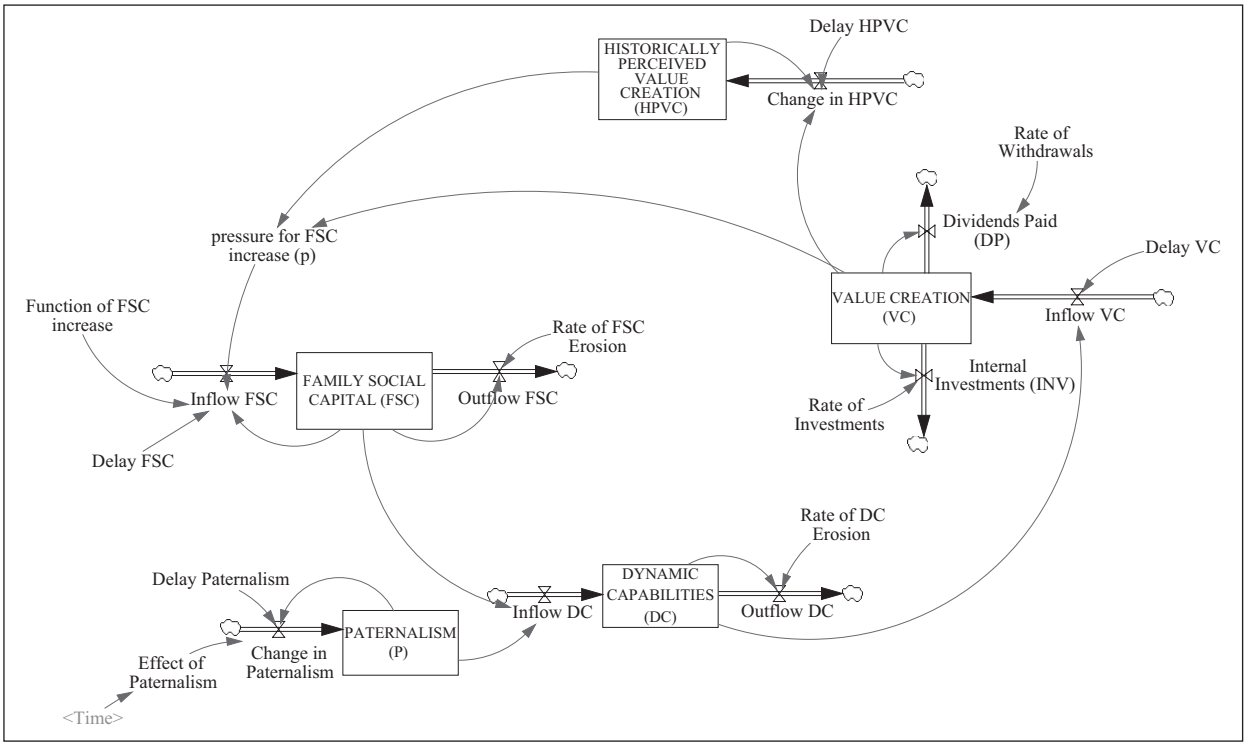


Figure 2. The structure of the model

X). These processes have some common constructs and so intersect in a set of circular causal loops. These causal loops can be positive such that feedback is self-reinforcing and amplifying or negative such that feedback is balancing (Sterman, 2000). Although each process may be well understood, their interactions are often difficult to predict.

Also, system dynamics is based on the principle of accumulation. It states that all dynamic behaviors in the world occur when *flows* (or rates) accumulate in *stocks* (or levels). Stocks accumulate resource flows and represent the memory of the system (Romme, Zollo & Berendsy, 2010). Stocks can be modified only by changes in the associated flows. Stocks and flows are thus the basic building blocks of a system dynamics model, which generate delays and enable scholars to analyze the feedback loops of the system (Sterman, 2000; see Appendix A for more details). The focus on feedback processes in which the dependent variables are embedded makes system dynamics particularly useful for our study as a way of representing phenomena characterized by a systematic interdependence among co-occurring causal factors.

The Structure of the Model

To set the model in motion and to make the simulation results easily replicable, it was necessary to assign numerical values to all the parameters and initialize all the state variables. The structure of the system dynamics model depicted in Figure 2 contains five stock variables: family social capital, DCs, value creation, paternalism, and historically perceived value creation. This latter construct captures historically accumulated information concerning value creation, and it is the result of a process of "psychological smoothing" (Forrester, 1961) through which decision makers create an "anchor" to articulate their decision routines. This anchoring process is well rooted and documented in the management literature (Lant, 1992; Sastry, 1997; Schneider, 1992; Sterman, 1987). As discussed earlier, each construct can be accumulated over time; it can

increase as well as decrease depending on the dynamics of the two corresponding flow variables.

Similar to Sastry (1997), we developed formulations to yield constructs that are measured in dimensionless units through an index function. The scaling of the functions was chosen for convenience, since we did not calibrate modeling on empirically collected numerical data, but we translated qualitative theorizing crystallized in received literature into formal representations (see Larsen & Lomi, 1999, 2002; Lomi & Larsen, 1996; Lomi et al., 2005; Lomi et al., 2010; Sastry, 1997).

First, family social capital (FSC) is sustained as a consequence of observed value creation (VC). As such, decision makers tend to create an anchor—historical perceived value creation (HPVC)—by crystallizing information concerning VC:

$$\mathrm{HPVC}(t) = \int_{t_0}^{t} \left[\text{Change in HPVC}(t)\right]dt + \mathrm{VC}(t_0). \quad (1)$$

$$\text{Change in HPVC}(t) = \frac{\mathrm{VC}(t) - \mathrm{HPVC}}{\text{Delay HPVC}}. \quad (2)$$

Thus, decision makers weight the last incoming information concerning VC with HPVC, which is the anchor that crystallizes past values of VC. The higher the ratio, which we defined as p, the stronger will be the impact on the update process of FSC:

$$p(t) = \frac{\mathrm{VC}(t)}{\mathrm{HPVC}(t)}. \quad (3)$$

$$\mathrm{FSC}(t) = \int_{t_0}^{t} \left[\text{Inflow FSC}(t) - \text{Outflow FSC}(t)\right]dt + \mathrm{FSC}(t_0). \quad (4)$$

$$\text{Inflow FSC}(t) = \frac{f^{\mathrm{FSC}}(p)}{\text{Delay FSC}}, \quad (5)$$

where

$$f^{\mathrm{FSC}'}(p) > 0 \quad \forall p; \quad f^{\mathrm{FSC}^{\mathrm{MAX}}} = 1; \quad f^{\mathrm{FSC}^{\mathrm{MIN}}} = 0.$$

$$\text{Outflow FSC}(t) = \mathrm{FSC}(t) * \text{Rate of Outflow FSC}. \quad (6)$$

As shown in the Equation (6), FSC erodes under the pressure of time at a fixed rate. The inclusion of a rate of erosion is necessary since, once accumulated, FSC erodes away if not continuously nurtured.

Second, in the model, we represented the process of DC evolution:

$$\mathrm{DC}(t) = \int_{t_0}^{t} \left[\text{Inflow DC}(t) - \text{Outflow DC}(t)\right]dt + \mathrm{DC}(t_0). \quad (7)$$

$$\text{Inflow DC}(t) = \mathrm{FSC} * f^{P}(P), \quad (8)$$

where

$$f^{P'} < 0; \quad f^{P''} < 0.$$

$$\text{Outflow DC}(t) = \mathrm{DC}(t) * \text{Rate of Outflow DC}(t). \quad (9)$$

Third, we modeled the process of paternalism (P), which increases as an exogenous function of time:

$$P(t) = \int_{t_0}^{t} \left[\text{Change in Paternalism}(t)\right]dt + P(t_0). \quad (10)$$

$$\text{Change in Paternalism}(t) = \frac{f^{P}(t)}{\text{Delay } P}, \quad (11)$$

where

$$f^{P}(t)^{\mathrm{MAX}} = 100; \quad f^{P}(t)^{\mathrm{MIN}} = 0; \quad f^{P'}(t) > 0.$$

Finally, VC is the result of an accumulation process, which follows from DC building, and two processes of erosion. The two processes of erosion are connected to dividends paid (DP) and internal investments (INV):

$$\mathrm{VC}(t) = \int_{t_0}^{t} \left[\text{InflowVC}(t) - \mathrm{DP}(t) - \mathrm{INV}(t)\right]dt + \mathrm{VC}(t_0). \quad (12)$$

$$\text{Inflow VC}(t) = \frac{\mathrm{DC}(t)}{\text{Delay VC}}. \quad (13)$$

$$\mathrm{DP}(t) = \mathrm{VC}(t) * \text{Rate of Withdrawals}. \quad (14)$$

$$\mathrm{INV}(t) = \mathrm{VC}(t) * \text{Rate of Investments}. \quad (15)$$

Details regarding parameters and initial values of the stocks that we used to simulate the model are reported in Appendix B. Values were based on previous case study research that specifically explored the relationships presented in our model (Chirico, 2008; Chirico &

Nordqvist, 2010; Salvato & Melin, 2008) and used a 'link-by-link approach' (Larsen & Lomi, 1999, 2002; Lomi et al., 2005; Lomi et al., 2010) to control the match of every single relation and symbolic representation in the simulation model with the original existing literature (see Chirico & Nordqvist, 2010; Dyer, 1986; Eishenardt & Martin, 2000; Pellegrini & Scandura, 2008; Teece et al., 1997; Salvato & Melin, 2008).

The set of values that we report represents one among the many plausible ones that satisfy dimensional consistency criteria. In fact, as it is common in simulation research, the numeric values of these casual relations had to be calibrated so that they were consistent with the other numeric values in the model (cf. internal consistency; see Lomi et al., 2005; Lomi et al., 2010; Mollona, 2010).

Additionally, given that existing research has not explored the evolution of paternalism over time in family firms, we created a time-based monotonic increasing function to mimic the impact of paternalism on unfolding dynamics of capability building. The function was activated and deactivated to test the impact on the model. Furthermore, through extensive experimentation and calibration, we found that differences in numerical values had only scaling implications for the overall behavior of the model. Finally, we have also performed some sensitivity runs to check the robustness of our simulation model (see robustness checks in the logic of enquiry and experiments' section).

Logic of Enquiry and Experiments

The results that we report are obtained by numerical integration in 50 time periods.[2] To thoroughly explore the model's behavior, we set up an experimentation protocol. The protocol was articulated in a number of steps directed at both testing the robustness of the model and investigating the rich repertoire of behaviors that the model produces and that may convey theoretical meaning. The gist of our experiment protocol was the analysis of model behavior when the paternalism function was activated or deactivated.

However, to increase the confidence that the computational representation was stable, we began our analysis by further testing our computational representation with *robustness checks*. These checks included four steps. First, we used alternative starting values of our constructs to confirm that the computational representation was robust to alternative initial conditions (see Zott, 2003). Second, we performed a large number of experiments and calibrations to completely explore the model's behaviors (Forrester & Senge, 1980). As discussed earlier, through these experiments it became possible to realize that changing numerical values in the model had only scaling implications and did not significantly alter the results of the simulation. After verifying that our model was reasonably insensitive to the choice of simulation time step—and to keep numerical integration errors sufficiently small—we selected a relatively small simulation time step ($dt = 0.125$).[3]

Third, we ran some extreme-conditions tests to verify that our software coding was correct (Barlas, 1996; Forrester & Senge, 1980). To start with, we set to zero all the stocks of our model to test whether the simulations showed what would happen in a similar condition in real life—that is, the business cannot be started. In addition, we confirmed that the model, when assuming that family social capital is equal to zero over time, generates a plausible behavior similar to the honeymoon effect described by Fichman and Levinthal (1991), in which expected failure of the business intervenes after an initial period of activity. Furthermore, we verified that the model produces creation of value over time when it is assumed that a percentage of family social capital is accumulated over time. Finally, we ran the simulation for 100 time periods to prove that the quality of behavior produced by the model was not the consequence of the observation of a snapshot of behavior generated in the transient state of the underpinning system structure. As expected, the simulation graphs tend to follow the same path (see Appendix C, Figures C.1 and C.2).

Fourth, to further confirm the accuracy of our simulation, we varied some basic assumptions. This approach is particularly useful when fundamentally different processes may reasonably exist (Davis et al., 2007). For instance, we considered a scenario in which paternalism was decreasing over time. As expected, in this situation, DCs, value creation, and family social capital tend to increase over time. This increased our confidence to the robustness of the simulation results.

Discussion

In the light of previous theory and empirical research, the results of the simulations allow us to formulate propositions that addresses our research questions and that can guide further research. Figures 3 and 4 show

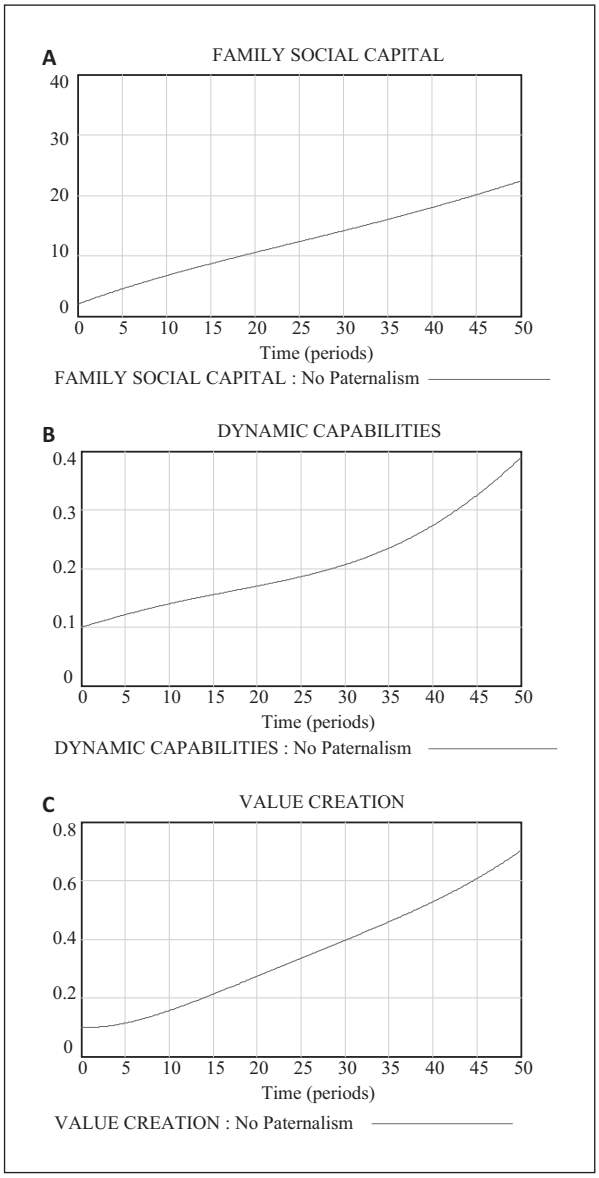


Figure 3. Simulation 1
Note. Assumption: Paternalism is deactivated.

the behavior of the model over 50 time periods. Looking at Figure 3A, B, and C obtained in the simulation experiments in which paternalism is deactivated, a positive feedback loop emerges that connects family social capital, DCs, and value creation. Following Sterman (2000, pp. 266-268), a positive feedback exists if the rate of change is an increasing function of the stock. Specifically, over time the higher the level of family social capital, the higher are the levels of DC and value creation in family firms, which, in turn, lead to higher levels of family social capital. The dynamic behavior generated by the positive feedback process implied by the causal loop is thus an "exponential growth." Thus, we formulate the following proposition:

> *Proposition 1:* A positive feedback loop exists among family social capital, dynamic capabilities, and value creation in family firms over time.

The causal links among family social capital, DCs, and value creation can be easily detected by looking at the relationships between each of the stocks and the behavior of rates of change of a connected other stock. For example, when family social capital goes up, the inflow into DCs grow as well. Figure 5 shows how the three stocks move in a coordinated way; they all increase driven by the positive feedback mechanisms. Accordingly, we report the behavior between (a) family social capital and DCs, (b) between DCs and value creation, and (c) between value creation and family social capital. However, it is important to note that the behavior of each stock is the result of the aggregate contribution of each connected rate of change. The role of the simulation is indeed to tease out the behavior of stocks as resulting from the combined pressures of different variables.

But what are the limiting factors that prevent family social capital, DCs, and value creation from increasing indefinitely in family firms? To answer this question, we ran a second set of experiments addressing the role of paternalism as a feature of family firm culture that may limit the accumulation of family social capital, DCs, and value creation over time. The simulation results of Figure 4A, B, and C suggest that how rapidly (or slowly) family social capital is converted into value creation depends on the paternalistic feature of the family firm culture. Specifically, initially (i.e., during the first 14 time periods), increasing levels of family social capital and low levels of paternalism are associated with high rates of DCs and value creation accumulation. In other words, during this early period the "asset" side of paternalism, such as loyalty, care, prudence, and support, seems to be positive for the firm's ability to recombine resources and create value. Later, higher levels of paternalism produce their pressure to decrease DCs and value creation accumulation rates ("liability"; see Figure 4B and C).

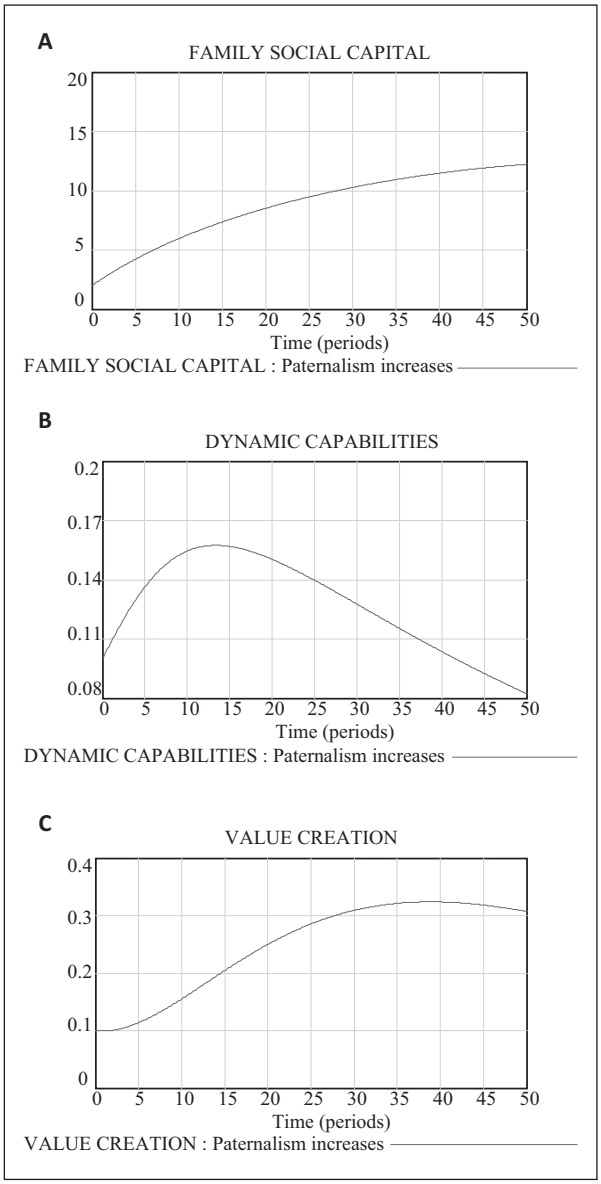


Figure 4. Simulation 2
Note. Assumption: Paternalism is activated and increases over time.

We also notice that in the initial 14 time periods, the levels of DCs and value creation result to be higher and increase faster when paternalism is activated and increases (Figure 4B and C) than when paternalism is deactivated (Figure 3B and C). In contrast, after this initial time period, the levels of DCs and value creation are much higher when paternalism is deactivated (Figure 3B and C) than when it increases over time (Figure 4B and C). This further supports our arguments.

Additionally, we find that family social capital tends to grow over time, but the increase is clearly higher when paternalism is deactivated. However, in the first eight time periods, the level of family social capital is the same both when paternalism is absent and when it increases over time (see Figure 3A and Figure 4A). This means that a culture where paternalism is a feature does not affect family relationships at the beginning of the firm's development, but over time paternalism makes family relationships less strong, producing lower levels of DCs and value creation. Family social capital is typically accumulating over time (Arregle et al., 2007; Salvato & Melin, 2008) as relationships become deeper and wider. Our study gives support to the idea that paternalism can halter and finally reduce this accumulation of social capital (simulation results are more evident in Appendix C, Figures C.1 and C.2). Overall, this means that over time the "liability" (or dark) side of paternalism takes over. In formal terms, we formulate the following proposition:

> *Proposition 2:* The effect of paternalism on DCs, value creation, and family social capital varies over time. Initially, increasing levels of family social capital and low levels of paternalism are associated with high rates of DCs and value creation accumulation. Later, higher levels of paternalism produce their pressure to decrease DCs, value creation, and family social capital accumulation rates.

Paternalism thus displays a negative effect in the long term, whereas it is associated with an increase in DCs and value creation accumulation in the short term. Such a result reflects both theoretical arguments depicting paternalism either as a benevolent or as an authoritarian behavior (cf. Pellegrini & Scanduria, 2008). Accordingly, our simulation experiments suggest that although previous research indicates that the founder often displays paternalistic behavior, she or he may be an entrepreneurial and caring person who brings a positive personal imprint to the business. She or he displays drive and energy, force of personality, and the desire to run things her or his way (Gersick, Davis, McCollom, & Lansberg, 1997; Schein, 1983). As Giddings (2003)

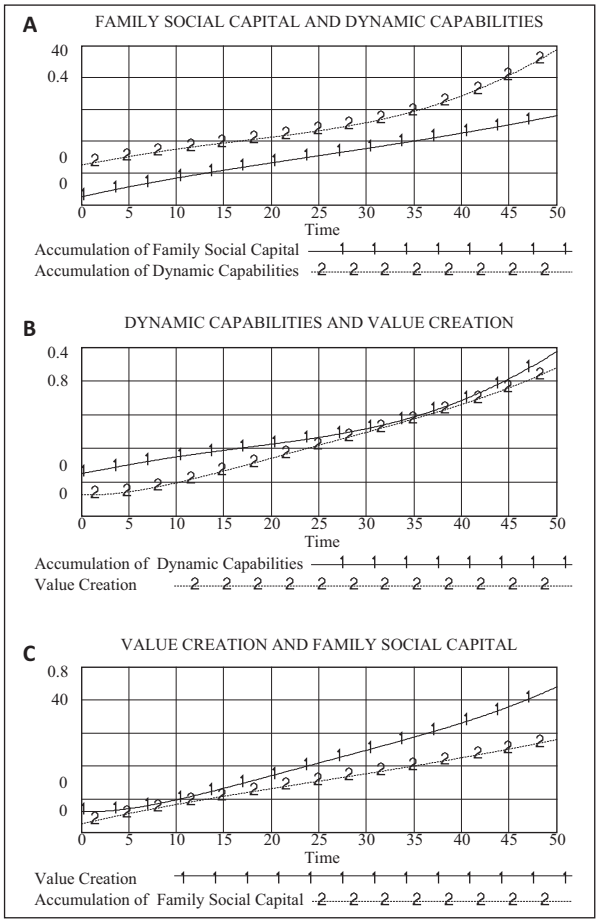


Figure 5. The causal links among dynamic capabilities, value creation, and family social capital

explains, the founder is often a paternalistic person, but this is good at the beginning of the activity when a mentor is needed and offspring must be guided and trained.

However, as time passes, "the founder alone . . . find it difficult to have innovative ideas without the fresh momentum added to the firm by second-generation members" (Salvato, 2004, p. 73). While displaying her or his paternalistic behavior, a dominating and autocratic climate derived from a paternalistic culture escalates and makes working conditions difficult for offspring (Dyer, 1986, 1988). Such a cultural behavior thus leads to path dependency in which "routines that worked well in the past are used again and again regardless of the strategic challenges facing the family firm" (Zahra, 2005, p. 24; see also Chirico et al., in press). Path dependency increases the risks of the family firm to fall into what Ahuja and Lampert (2001) name a familiarity trap that is searching for solutions in the neighborhood of existing solutions.

In fact, a too dominant and "caring" approach by the founder or controlling owner may create conflicts and suffocate the ability for other members of the family and the firm to contribute to value creation through new ideas and change initiatives (Johannisson & Huse, 2000; Salvato et al., 2010). The founder may overly centralize the decision-making process and take measures to protect her or his own vision from being challenged. In recent conceptual research, it has been suggested that such instances of paternalism threaten the loss of positive family-influenced resources, that is, familiness, such as family social capital (Lim et al., 2010). This in turn may inhibit DCs and value creation as a result of, for instance, lowered risk-taking propensities. This rigidity prevents the family firm from having the flexibility to adapt when situations change and tends to transform core capabilities into core rigidities. In this respect, Davis and Harveston (1999) refer to a "generational shadow" as the enduring effect of previous strategic paths and obsolete practices on a family firm's subsequent evolution. The result from our simulation research seems to support this notion.

Interestingly, several conceptual and empirical works on founders' and top executives' tenures strongly corroborate our simulation results. For instance, Rubenson and Gupta (1992) argue that founders

> tend to (1) be overly dependent on one or two key individuals, (2) be highly centralized, (3) lack adequate middle-management skills, and (4) exhibit a paternalistic atmosphere, . . . characteristics [that] are incompatible with the needs of a mature organization (p. 54),

even though they might enable the nimble structures necessary for early growth. Similarly, Jayaraman, Khorana, Nelling, and Covin (2000) found that "[F]ounders create their organizations, yet are often expected to eventually become *liabilities* to these same organizations" (p. 1215). Specifically, different scholars (Hambrick & Fukutomi, 1991; Henderson, Miller, & Hambrick, 2006; Miller, 1991; Miller & Shamsie, 2001) theorized and empirically found that over time, top executives become overly committed to their earlier formulas, and their organizations become so tightly

aligned with the status quo that change becomes difficult to consider and even harder to execute. The result is an inverted-U relationship between top executives' tenures and firm performance. Also, Henderson et al. (2006) show that excessive conservative behaviors and negative outcomes emerge on average after about 15 years of top executives' tenures. Similar results arise from the empirical works of Miller (1991) and Miller and Shamsie (2001).

Limitations

We recognize that our study has limitations. First, although some researchers argue that creating a "good" theory is the central point in theory development, giving less attention to external validation (Van Maanen, 1995; Weick, 1989), we recognize that a limitation of our study is related with model validation—that is, the match between simulation results and empirical "reality." However, as discussed earlier, following Larsen and colleagues (Larsen & Lomi, 1999, 2002; Lomi et al., 2005; Lomi et al., 2010), we relied on previous case study research and attempted to validate our simulation results with a 'link-by-link approach' (see Chirico & Nordqvist, 2010; Dyer, 1986; Eishenardt & Martin, 2000; Pellegrini & Scandura, 2008; Teece et al., 1997). However, the validity of simulation models presents the same problems of any other kind of empirical model. Lomi and Larsen (2001) posit that "computational and simulation models of organizations differ from other kinds of models like empirical models, only in terms of the constraints that define the specific language being used" (p. 11). In this respect, Sterman (2000) agrees that specific validation and verification of numerical and simulation models are impossible but this is not limited to computer models but to any theory and research that relies on simplifications of the real world and assumptions.

Second, we did not consider that an authoritarian approach can also cause rebellion rather than inertia. In some family firms, young generations may react to paternalism by rejecting the authority of the older generation and creating change by revolutionary behaviors. Third, it is well known that private family firms value not only financial performance but also noneconomic socioemotional factors such as maintaining family influence over the firm for generations (Gómez-Mejía et al., 2007, p. 106). Our choice to focus on financial value creation is a limitation that should be addressed in future research.

Finally, our results can be interpreted only in a relative sense through time periods, given that our constructs are dimensionless index functions by construction (i.e., dimensionless units; Larsen & Lomi, 1999; Lomi et al., 2010; Sastry, 1997). Simulation experiments indeed do not predict the future but just provide consistent stories about the future (Morecroft & Sterman 1994, pp. 17-18). Our results, however, could open an intriguing avenue for further empirical research since the translation of generic units of time, within which specific phenomena occur in specific time units (e.g., months, quarters, years), is an interesting empirical issue.

Future Research

In the future, more accurate scenarios of paternalism could be formalized after empirical research, and some components of the model may be disaggregated to focus on particular issues related to family firms. For instance, paternalism may be described by a stepwise function related to the generation running the family firm.[4] Additionally, paternalism may be articulated into benevolent, exploitative, authoritative and authoritarian paternalism (see Pellegrini & Scandura, 2008), and DCs into resource acquisition, exchange, transformation, and shedding (see Eishenardt & Martin, 2000). Such specifications may clarify the "true" relationship between the different components of paternalism and DCs. This may also further explain the nonlinear effects found in this study and whether or not it may occur at the beginning of each new generation when a new family generation takes over. Paternalism may also differently affect family firms depending on their different ownership and governance structures across generations (e.g., controlling owner, sibling partnership, or cousin consortium; see Gersick et al., 1997), as well as depending on whether they are private or public. Additionally, high levels of DCs may presumably enable a firm to adjust the behavior of its members such as excessive paternalism. Thus, reverse causalities, for instance, from DCs to paternalism or from DCs to family social capital, need to be explored.[5]

Finally, future research should be also directed to test our propositions with empirical data. Our simulation results will thus serve as a basis for subsequent empirical work to assess their correspondence with observable behavior (Davis et al., 2007; Harrison et al., 2007). However, given the difficulty to collect longitudinal statistical data on sensitive constructs such as paternalism, an alternative approach may be to compare our simulation results with more detailed case study data to enable granular validation (i.e., whether the simulation is consistent with the specific details of multiple case studies).

Implications for Practice

This research has also practical implications. Value creation in family firms depends on the ability of top managers to "solicit many ideas from a lot of people" (Aronoff & Ward, 1997, p. 26). It is, therefore, important over time not to restrict the strategic thinking to the top management team but to view members at all levels of the organization as potential entrepreneurs. This perspective suggests that all members of the organization must be encouraged to make suggestions and take initiatives on their own. However, if the organizational culture is not supportive, the organization's chances of arriving at a participative decision-making environment are quite small. Accordingly, Chirico and Nordqvist (2010) found that inefficient resource management, along with its negative effect on the family firm's value creation, often results from a paternalistic culture in which the latest generation is

> in the shadow of the previous generations . . . and strategic decisions are always taken by them in a non-participative atmosphere . . . that . . . shape[s] and limit[s] family members' innovative initiatives and directly or indirectly restrict their choices so as to cause inertia. (p. 14)

Thus, the organizational culture is essential for entrepreneurship in family firms.

Conclusions

Drawing on system dynamics methods and simulation experiments, this article offers an interpretation of the associations between family social capital, DCs, and value creation. In particular, we focus on the role of paternalism as a feature of family firm culture on these relationships. Bothner and White (2001) posit that

> simulation models are always formulated as mechanisms for simplifying the moving parts of a social process down to it core features. Such endeavors succeed when, in reducing the real world complexity, they nearly inviolate the established facts and yield surprising insights for further exploration. (p. 206)

Empirical studies usually ignore the complex feedback structure linking individual propositions or hypotheses for the purpose of specifying estimable statistical models. By using simulation methods, we were able to exploit the rich dynamic feedback structure linking the constructs of our interest.

More specifically, we have set out to address two research questions reflective of the dual aim of our research:

> *Research Question 1:* How and when does paternalism affect DCs and by association value creation in family firms?
> *Research Question 2:* How can simulation experiments shed light on complex decision processes in family firms?

Accordingly, our study offers both theoretical and methodological contributions. First, the present article sheds new light on the relational (Arregle et al., 2007) and cultural (Zahra et al., 2004) mechanisms through which value creation is generated in private family firms. Specifically, through simulation experiments, we developed two propositions on the nature and dynamic interaction among family social capital, DCs, value creation, and paternalism.

Interesting results emerge regarding the role of paternalism on resource recombination processes in family firms. In this respect, our study shows that the founder's paternalism may be seen as positive as it helps guide and train the next generation in the initial stage of the activity when the two generations start working together. But as time passes, a dominating and autocratic climate may escalate and make working conditions difficult for the new generation. Put differently, the founder's strong, hard-driving qualities that were essential at the earlier

business stages (Schein, 1983) become less critical as the business grows and matures. A growing paternalistic behavior "may prove to be increasingly less functional over time and may actually sow the seeds for an organization that is ill equipped to change and adapt in the face of new business realities and demands." In other words, "[T]he very strengths that help a family business get off the ground can ultimately lead to its undoing" (Giddings, 2003, p. 40). Paradoxically, the cause of failure may reside in what was once the source of success.

This result enables us to better understand the phenomenon of paternalism both in family and nonfamily firm research and practice as it sheds new light on the extant contradicting theoretical arguments that depict paternalism as either a benevolent (e.g., Redding et al., 1994) or authoritarian behavior (e.g., Uhl-Bien & Maslyn, 2005), or both (e.g., Farh & Cheng, 2000). Our research suggests that paternalism may produce positive or negative outcomes based on its level (i.e., low or high) and the specific time in which this behavior occurs (i.e., early stage or later stage of the firm). Our work also extends the existing family firm literature by moving beyond the static emphasis on family resources inherent for instance in the concept of "familiness" (Habbershon & Williams, 1999) and examines not only the endowment of resources but also their actual use and challenges in value creating activities (Eddleston, Kellermanns, & Sarathy, 2008).

Second, new and alternative methodological approaches are needed to develop the family business field of research and to address fundamental questions about family firms. To the best of our knowledge, our work is the first effort to adopt a simulation method in a family firm context. In fact, an aim in this article was to provide an explanation and overview of simulation methodology. Computer simulation can be a powerful way to do science. Simulation "makes it possible to study problems that are not easy to address—or are impossible to address—with other scientific approaches" (Harrison et al., 2007, p. 1243). Because organizations, especially private family firms, are complex systems and many of their characteristics and behaviors are often inaccessible to researchers, especially over time, simulation can be a particularly useful research tool for family firm scholars. Using systems dynamics and simulation experiments, we were able to put together some pieces derived from the existing rather fragmented research on DCs, value creation, and the role of paternalism in family firms and to propose an integrated dynamic model.

Finally, we contend that our analysis may help better understand competitive actions and patterns involving other organizational forms than family firms. At least some of the features of the relationships that occur in the family firm context could probably generalize to other organizations (see Arregle et al., 2007). Recently, Pearce (2005) claimed that paternalism is never completely removed from even the most rationalistic organizations. Thus, relational and cultural behaviors existing in family firms may be similarly developed in other types of organizations, especially those characterized by strong ties and emotional commitments.

Appendix A

Feedback Loops and Stocks and Flows

As reported by S. Gary and Larsen (2000), in a feedback loop diagram the arrow linking any two variables, x and y, indicates a causal relationship exists between x and y. The sign at the head of each arrow denotes the nature of the relationship as follows:

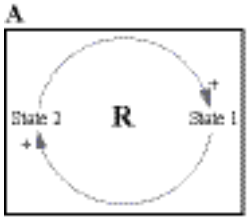
$$x \xrightarrow{+} y \Rightarrow \frac{\partial y}{\partial x} > 0$$

and

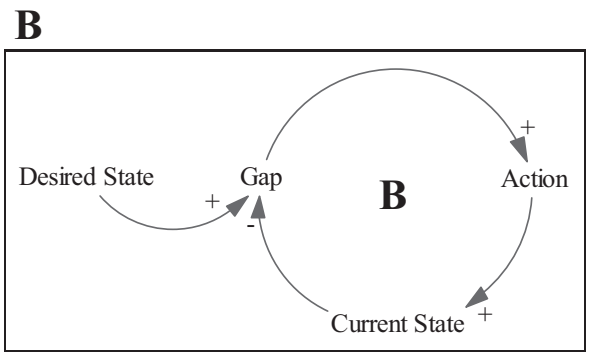
$$x \xrightarrow{-} y \Rightarrow \frac{\partial y}{\partial x} < 0.$$

An arrow from x to y with a positive sign signifies that the partial derivative of y with respect to x is positive; and an arrow with a negative sign indicates a negative partial derivative. Moreover, the polarity of each feedback loop is determined by tracing through the effects of each link, starting with any variable, until the loop is closed. If the net effect is to reinforce an initial change in the variable chosen as the starting point, the loop is positive and labeled with the letter **R** (*reinforcing loop)*. If an initial change is counteracted, the loop is negative and labeled with the letter **B** (*balancing loop*):

a. *Reinforcing Loop* (**R**) is a structure that feeds on itself to produce growth or decline: "State 1" (the cause) increases or decreases "State 2" (the effect), which, in turn, increases or decreases "State 1," respectively. In other words, **R** tends to reinforce or amplify whatever is happening in the system:



b. However, nothing grows forever. There must be some limits to growth that are created by negative feedbacks (Sterman, 2000). *Balancing Loop* (**B**) counteracts and opposes change. It attempts to move some "Current State" to a "Desired State" (it is assumed that "Current State" is lower than "Desired State") through some "Action": the "Desired State" interacts with the "Current State" to produce a "Gap." The larger the "Gap" the stronger the influence to produce "Action." The "Action" taken then moves the "Current State" toward the "Desired State," reducing the "Gap" to zero:



Stocks and flows are the basic building blocks of a system dynamics model (see Figure A.1), which generate delays and enable scholars to analyze the feedback loops of the system. A *stock* is an entity that is accumulated over time by inflows and depleted by outflows. It accumulates past events characterizing the state of the system. A stock typically has a certain value at each moment of time (e.g., family social capital). Mathematically, a stock (S) can be seen as an integration (accumulation) of the difference between inflow and outflow (F) in the long term:

$$S_t = \int_{t0}^{t} \left[\text{Inflow}(t) - \text{Outflow}(t)\right] dt + S(t_0).$$

A *flow* changes a stock over time by inflows and outflows (e.g., inflow and outflow of family social capital). It is typically measured over a certain interval of time. Mathematically, a flow (F) can be seen as the derivative of the stock (S) with respect to the time (t), that is, its net rate of change:

$$F = \text{inflow} - \text{outflow}; \quad F = \frac{dS}{dt}.$$

Moreover, stocks are the source of delays. A *delay* is the amount of time by which an event is retarded. It is the time between the instant at which a given event occurs and the instant at which a related aspect of that event occurs. Delays are responsible for generating effects that are very often nonlinear and counterintuitive in the real world (Sterman, 2000).

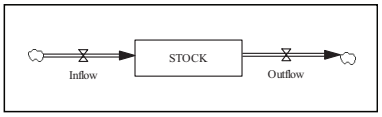


Figure A.1. Stock and flows

Parameters

Sector	Variable	Type	Value
HPVC	HPVC	Initial value	0.1
HPVC	Delay HPVC	Constant	3
FSC	FSC	Initial value	2
FSC	Rate of FSC erosion	Constant	0.03
FSC	Delay FSC	Constant	3
DC	DC	Initial value	0.1
DC	Rate of DCs erosion	Constant	0.05
VC	VC	Initial value	0.1
VC	Delay VC	Constant	3
VC	Rate of withdrawals	Constant	0.05
VC	Rate of Investments	Constant	0.1
P	*P*	Initial value	1
P	Delay *P*	Constant	3

Note. HPVC = historically perceived value creation; DC = dynamic capability; FSC = family social capital; VC = value creation; *P* = paternalism.

Appendix C

Simulation Results in 100 Time Periods

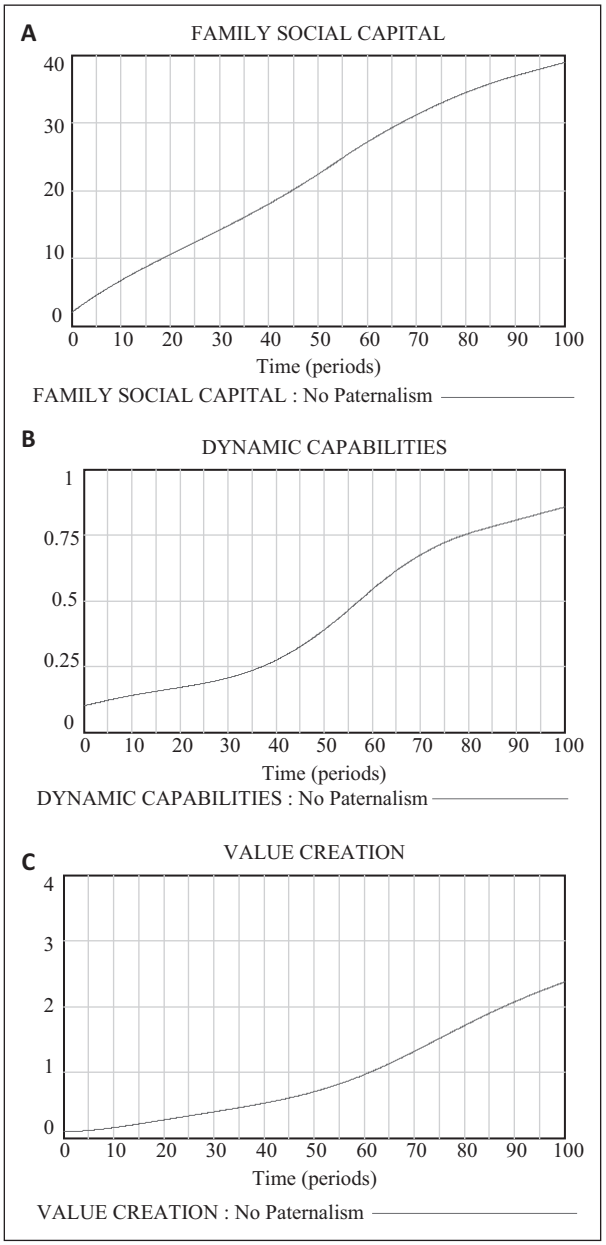


Figure C.1. Simulation 3
Note. Assumption: Paternalism is deactivated.

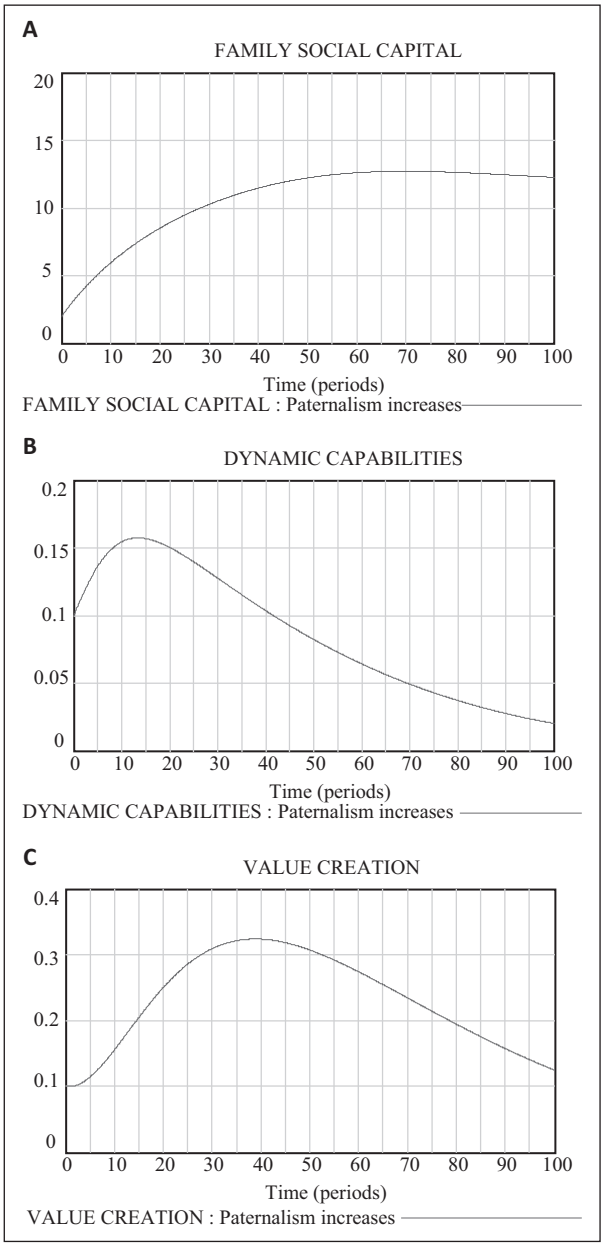


Figure C.2. Simulation 4
Note. Assumption: Paternalism is activated and increases over time.

Appendix B

Equations and Parameters

Indications coming from theory are rarely sufficiently detailed to define model specification uniquely. Assumptions are typically needed to translate theoretical statements about causal relations among variables into a computable (or estimable) model. To make the results reported fully reproducible, in Appendix B, we report the equations and parameters we used to set the model in motion (see Lomi et al., 2005; Lomi et al., 2010; Mollona, 2010; Sterman, 2000).

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Notes

1. However, some other scholars argue that simulation methods often yield very little in terms of actual theory development. They suggest that simulations either replicate the obvious or strip away so much realism that they are simply too inaccurate to yield valid theoretical insights (Fine & Elsbach, 2000).
2. We used Vensim (Version PLE 5.10a), a software package designed for system dynamics simulation. To reduce the risk of reporting software-specific results, in terms, for example, of small differences in the results of the employed numerical integration method, the model was rebuilt and simulated with Powersim (Version 2.5), another popular software used for system dynamics modeling. The results obtained were identical.
3. It indicates that the results of simulation are saved eight times in each time step.
4. We thank one of the anonymous reviewers for this insightful comment.
5. We thank the editors and reviewers for these helpful insights.

References

Abelson, H., Sussman, G. J., & Sussman, J. (1996). *Structure and interpretation of computer programs*. Cambridge: MIT Press.

Ahuja, G., & Lampert, C. M. (2001). Entrepreneurship in the large corporation: A longitudinal study of how established firms create breakthrough inventions. *Strategic Management Journal, 22*, 221-238.

Aronoff, C. E., & Ward, J. L. (1997). *Preparing your family business for strategic change* (Family Business Leadership Series No. 9). Marietta, GA: Business Owner Resources.

Arregle, L., Hitt, M., Sirmon, D., & Very, P. (2007). The development of organizational social capital: Attributes of family firms. *Journal of Management Studies, 44*, 73-95.

Barlas, Y. (1996). Formal aspects of model validity and validation in system dynamics models. *System Dynamics Review, 12*, 183-210.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management, 17*, 99-120

Bothner, M., & White, H. (2001). Market orientation and monopoly power. In A. Lomi & E. R. Larsen (Eds.), *Dynamics of organizations: Computational modeling and organization theories* (pp. 182-209). Menlo Park, CA: AAAI/MIT Press.

Bruderer, E., & Singh, J. S. (1996). Organizational evolution, learning, and selection: A genetic-algorithm-based model. *Academy of Management Journal, 39*, 1322-1349.

Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrade-multimethod matrix. *Psychological Bulletin, 56*, 81-105.

Campbell, D. T., & Stanley, J. C. (1966). *Experimental and quasi-experimental designs for research*. Chicago, IL: Rand McNally.

Carley, K. M. (2001). Computational approaches to sociological theorizing. In J. Turner (Ed.), *Handbook of sociological theory* (pp. 69-84). New York, NY: Kluwer Academic/Plenum.

Carney, M. (2005). Corporate governance and competitive advantage in family-controlled firms. *Entrepreneurship Theory and Practice, 29*, 249-265.

Chirico, F. (2008). Knowledge accumulation in family firms: Evidence from four case studies. *International Small Business Journal, 26*, 433-462.

Chirico, F., Ireland, D., & Sirmon, D. (2011). Franchising and the family firm: Creating unique sources of advantage through "Familiness." *Entrepreneurship Theory and Practice, 35*, 483-501.

Chirico, F., & Nordqvist, M. (2010). Dynamic capabilities and transgenerational value creation in family firms: The role of organizational culture. *International Small Business Journal, 20*, 1-18.

Chirico, F., & Salvato, C. (2008). Knowledge integration and dynamic organizational adaptation in family firms. *Family Business Review, 21*, 169-181.

Chirico, F., Sirmon, D., Sciascia, S., & Mazzola, P. (in press). Resource orchestration in family firms: Investigating how entrepreneurial orientation, generational involvement and participative strategy affect performance. *Strategic Entrepreneurship Journal*.

Cohen, M. D., March, J., & Olsen, J. P. (1972). A garbage can model of organizational choice. *Administrative Science Quarterly, 17*, 1-25.

Colli, A. (2003). *The history of family business 1850–2000*. Cambridge, England: Cambridge University Press.

Davis, J. P., Bingham, C. B., & Eisenhardt, K. M. (2007). Developing theory through simulation methods. *Academy of Management Review, 32*, 580-599.

Davis, P. S., & Harveston, P. (1999). In the founder's shadow: Conflict in the family firm. *Family Business Review, 7*, 311-323.

Dess, G. D., Lumpkin, G. T., & McGee, J. E. (1999). Linking corporate entrepreneurship to strategy, structure and process: suggested research directions. *Entrepreneurship Theory and Practice, 23*, 85-102.

Dyer, W. G. (1986). *Cultural change in family firms: Anticipating and managing businesses and family traditions*. San Francisco, CA: Jossey-Bass.

Dyer, W. G. (1988). Culture and continuity in family firms. *Family Business Review, 1*, 37-50.

Eddleston, K. A., Kellermanns, F. W., & Sarathy, R. (2008). Resource configuration in family firms: Linking resources, strategic planning and technological opportunities to performance. *Journal of Management Studies, 45*, 26-50.

Eddleston, K. A., Kellermanns, F. W., & Zellweger, T. M. (2010). Exploring the entrepreneurial behavior of family firms: Does the stewardship perspective explain differences. *Entrepreneurship Theory and Practice*. Advance online publication. doi:10.1111/j.1540-6520.2010.00402.x

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal, 21*, 1105-1121.

Farh, J. L., & Cheng, B. S. (2000). A cultural analysis of paternalistic leadership in Chinese organizations. In J. T. Li, A. S. Tsui, & E. Weldon (Eds.), *Management and organizations in the Chinese context* (pp. 84-127). London, England: Macmillan.

Farh, J. L., Cheng, B. S., Chou, L. F., & Chu, X. P. (2006). Authority and benevolence: Employees' responses to paternalistic leadership in China. In A. S. Tsui, Y. Bian, & L. Cheng (Eds.), *China's domestic private firms: Multidisciplinary perspectives on management and performance* (pp. 230-260). New York, NY: Sharpe.

Fichman, M., & Levinthal, D. A. (1991). Honeymoons and the liability of adolescence: A new perspective on duration dependence in social and organizational relationships. *Academy of Management Review, 16*, 442-468.

Fine, G. A., & Elsbach, K. D. (2000). Ethnography and experiment in social psychological theory building. *Journal of Experimental Social Psychology, 36*, 51-76.

Fioresi, R., & Mollona, E. (2010). Devices for theory development: Why use computer simulation if mathematical analysis is available? In E. Mollona (Ed.), *Computational analysis of firms' strategy and organizations* (pp. 69-105). New York, NY: Routledge.

Forrester, J. W. (1961). *Industrial dynamics.* Cambridge: MIT Press.

Forrester, J. W., & Senge, P. M. (1980). Tests for building confidence in system dynamics models. *TIMS Studies in the Management Science, 14*, 209-228.

Gary, S., & Larsen, E. R. (2000). Improving firm performance in out-of-equilibrium, deregulated markets using feedback simulation models. *Energy Policy, 28*, 845-855.

Gelfand, M. J., Erez, M., & Aycan, Z. (2007). Cross-cultural organizational behavior. *Annual Review of Psychology, 58*, 479-514.

Gersick, K. E., Davis, J. A., McCollom, M., & Lansberg, I. (1997). *Generation to generation: Life cycles of the family business.* Boston, MA: Harvard Business School Press.

Giddings, T. (2003, March 17). Avoid these family business obstacles [Advertising supplement]. *Los Angeles Business Journal, 40*.

Gómez-Mejía, L. R., Haynes, K. T., Núñez-Nickel, M., Jacobson, K. J. L., & Moyano-Fuentes, J. (2007). Socioemotional wealth and business risks in family-controlled firms: Evidence from Spanish olive oil mills. *Administrative Science Quarterly, 52*, 106-137.

Granata, D., & Chirico, F. (2010). Measures of value in acquisitions: Family versus non-family firms. *Family Business Review, 23*, 341-354.

Habbershon, T. G., & Williams, M. L. (1999). A resource-based framework for assessing the strategic advantages of family firms. *Family Business Review, 7*, 1-25.

Hall, A., Melin, L., & Nordqvist, M. (2001). Entrepreneurship as radical change in the family business: Exploring the role of cultural patterns. *Family Business Review, 14*, 193-208.

Hambrick, D. C., & Fukutomi, G. (1991). The seasons of a CEO's tenure. *Academy of Management Review, 16*, 719-742.

Hanneman, R., Collins, R., & Mordt, G. (1995). Discovering theory dynamics by computer simulation: Experiments on state legitimacy and imperialist capitalism. In P. Marsden (Ed.), *Sociological methodology* (pp. 1-46). Oxford, England: Blackwell.

Harrison, J. R., Lin, Z., Carroll, G. R., & Carley, K. M. (2007). Simulation modeling in organisational and management research. *Academy of Management Review, 32*, 1229-1245.

Henderson, A. D., Miller, D., & Hambrick, D. C. (2006). How quickly do CEOs become obsolete? Industry dynamism, CEO tenure, and company performance. *Strategic Management Journal, 27*, 447-460.

Hofstede, G. (2001). *Culture's consequences* (2nd ed.). Thousand Oaks, CA: SAGE.

Kogut, B., & Zander, U. (1992). Knowledge of the firm, combinative capabilities, and the replication of technology. *Organization Science, 3*, 383-397.

Jackman, M. R. (1994). *The velvet glove: Paternalism and conflict in gender, class, and race relations*. Berkeley: University of California Press.

Jayaraman, N., Khorana, A., Nelling, E., & Covin, J. (2000). CEO founder status and firm financial performance. *Strategic Management Journal, 21*, 1215-1224.

Johannisson, B., & Huse, M. (2000) Recruiting outside board members in the small family business: An ideological challenge. *Entrepreneurship & Regional Development,*12, 353-378.

Lant, T. K. (1992). Aspiration level adaptation: An empirical exploration. *Management Science, 38*, 623-644.

Larsen, E., & Lomi, A. (1999). Resetting the clock: A feedback approach to the dynamics of organizational inertia, survival and change. *Journal of the Operational Research Society, 50*, 406-421.

Larsen, E., & Lomi, A. (2002). Representing change: A systems model of organizational inertia and capabilities as dynamic accumulation processes. *Simulation Modelling Practice and Theory, 10*, 271-296.

Law, A. M., & Kelton, W. D. (1991). *Simulation modeling and analysis*. New York, NY: McGraw-Hill.

Lim, E. N. K., Lubatkin, M. H., & Wiseman, R. M. (2010). A family firm variant of the behavioral agency theory. *Strategic Entrepreneurship Journal, 4*, 197-211.

Lomi, A., & Larsen, E. (1996). Interacting locally and evolving globally: A computational approach to the dynamics of organizational populations. *Academy of Management Journal, 39*, 1287-1321.

Lomi, A., & Larsen, E. (Eds.). (2001). *Dynamics of organizations: Computational modeling and organization theories.* Menlo Park, CA: AAAI/MIT Press.

Lomi, A., Larsen, E., & Freeman, J. (2005). Things change: Dynamic resource constraints and system-dependent selection in the evolution of organizational populations. *Management Science, 51*, 882-903.

Lomi, A., Larsen, E., & Wezel, F. (2010). Getting there: Exploring the role of expectations and pre-production delay in processes of organizational founding. *Organization Science, 21*, 132-149.

March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science, 2*, 71-87.

Miller, D. (1991). Stale in the saddle: CEO tenure and the match between organization and environment. *Management Science, 37*, 34-52.

Miller, D., & Shamsie, J. (2001). Learning across the life cycle: Experimentation and performance among the Hollywood studio heads. *Strategic Management Journal, 22*, 725-745.

Mollona, E. (2010). The use of computer simulation in strategy and organization research. In E. Mollona (Ed.), *Computational analysis of firms' strategy and organizations* (pp. 3-35). New York, NY: Routledge

Mollona, E., & Hales, D. (2006). Knowledge-based jobs and the boundaries of firms: Agent-based simulation of firms learning and workforce skill set dynamics. *Computational Economics, 27*(1), 35-62.

Mollona, E., & Marcozzi, A. (2009a). FirmNet: The scope of firms and the allocation of task in a knowledge-based economy. *Computational & Mathematical Organization Theory, 15*, 109-126.

Mollona, E., & Marcozzi, A. (2009b). Self-emerging coordination mechanisms for knowledge integration processes. *Mind & Society, 8*, 223-241.

Morecroft, J., & Sterman, J. (1994). *Modeling for learning organizations.* Portland, OR: Productivity Press.

Nahapiet, J., & Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review, 23*, 242-266.

Pearce, J. L. (2005, August). *Paternalism and radical organizational change*. Paper presented at the annual meeting of the Academy of Management, Honolulu, HI.

Pellegrini, E. K., & Scandura, T. A. (2006). Leader-member exchange (LMX), paternalism and delegation in the Turkish business culture: An empirical investigation. *Journal of International Business Studies, 37*, 264-279.

Pellegrini, E. K., & Scandura, T. A. (2008). Paternalistic leadership: A review and agenda for future research. *Journal of Management, 34*, 566-593.

Redding, S. G., Norman, A., & Schlander, A. (1994). The nature of individual attachment to theory: A review of East Asian variations. In M. D. Dunnett, L. M. Hough, & H. C. Triandis (Eds.), *Handbook of industrial and organizational psychology* (pp. 674-688). Mountain View, CA: Consulting Psychology Press.

Rivkin, J. W. (2000). Imitation of complex strategies. *Management Science, 46*, 824-844.

Romme, A. G. L., Zollo, M., & Berends, P. (2010). Dynamic capabilities, deliberate learning and environmental dynamism: a simulation model. *Industrial and Corporate Change 19*(4), 1271-1299.

Rubenson, G. C., & Gupta, A. K. (1992). Replacing the founder: Exploding the myth of the entrepreneur's disease. *Business Horizons, 35*(6), 53-59.

Rudolph, J., & Repenning, N. (2002). Disaster dynamics: Understanding the role of quantity in organizational collapse. *Administrative Science Quarterly, 47*, 1-30.

Salvato, C. (2004). Predictors of entrepreneurship in family firms. *Journal of Private Equity, 7*, 68-76.

Salvato, C., Chirico, F., & Sharma, P. (2010). A farewell to the business: Championing exit and continuity in entrepreneurial family firms. *Entrepreneurship & Regional Development, 22*, 1-28.

Salvato, C., & Melin, L. (2008). Creating value across generations in family controlled businesses: The role of family social capital. *Family Business Review, 23*, 259-276.

Sastry, M. A. (1997). Problems and paradoxes in a model of punctuated organizational change. *Administrative Science Quarterly, 42*, 237-275.

Schein, E. (1983). The role of the founder in creating organizational culture. *Organizational Dynamics, 12*, 13-28.

Schneider, S. L. (1992). Framing and conflict: Aspiration level contingency, the status quo, and current theories of risky choice. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 18*, 1040-1057.

Schumpeter, J. (1934). *The theory of economic development*. Cambridge, MA: Harvard University Press.

Sharma, P., & Manikutty, S. (2005). Strategic divestments in family firms: Role of family structure and community culture. *Entrepreneurship Theory and Practice, 29*, 293-312.

Sirmon, D. G., Arregle, J. L., Hitt, M. A., & Webb, J. W. (2008). The role of family influence in firms' strategic response to competitive threat. *Entrepreneurship Theory and Practice, 32*, 979-998.

Sirmon, D. G., & Hitt, M. A. (2003). Managing resources: Linking unique resources, management and wealth creation in family firms. *Entrepreneurship Theory and Practice, 27*, 339-358.

Sirmon, D. G., Hitt, M. A., & Ireland, R. D. (2007). Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of Management Review, 32*, 273-292.

Sterman, J. D. (1987). Expectation formation in behavioral simulation models. *Behavioral Science, 32*, 190-211.

Sterman, J. D. (2000). *Business dynamics, systems thinking and modeling for a complex world*. New York, NY: McGraw-Hill.

Stewart, A. (2003). Help one another, use one another: Toward an anthropology of family business. *Entrepreneurship Theory and Practice, 27*, 383-396.

Tagiuri, R., & Davis, J. A. (1996). Bivalent attributes of the family firm. *Family Business Review, 9*, 199-208.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*, 509-533.

Uhl-Bien, M., & Maslyn, M. (2005, August). *Paternalism as a form of leadership: Differentiating paternalism from leader member exchange*. Paper presented at the annual meeting of the Academy of Management, Honolulu, HI.

VandenBos, G. R. (2007). *APA dictionary of psychology*. Washington, DC: American Psychological Association.

Van Maanen, J. (1995). Style as theory. *Organization Science, 6*, 133-143.

Weick, K. E. (1989). Theory construction as disciplined imagination. *Academy of Management Review, 14*, 516-531.

Westwood, R., & Chan, A. (1992). Headship and leadership. In R. Westwood (Ed.), *Organisational behaviour: Southeast*

Asian perspectives (pp. 118-143). Hong Kong, SAR: Longman.

Zahra, S. A. (2005). Entrepreneurial risk taking in family firms. *Family Business Review, 18*, 23-40.

Zahra, S. A., Hayton, J., & Salvato, C. (2004). Entrepreneurship in family vs. non-family firms: A resource-based analysis of the effect of organizational culture. *Entrepreneurship Theory and Practice, 29*, 363-382.

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science, 13*, 339-351.

Zott, C. (2003). Dynamic capabilities and the emergence of intra-industry differential firm performance: Insights from a simulation study. *Strategic Management Journal, 24*, 97-125.

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