Learning Not to Diversify: The Transformation of Graduate Business Education and the Decline of Diversifying Acquisitions

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Abstract
Once a preferred strategy, corporate diversification into disparate lines of business has gradually declined in the U.S. over the past several decades. We argue that changes that occurred in a closely related domain—graduate business education—are important in understanding variation in de-diversification across firms. Building on a historical account of the transformation of business education, we explain how the rise of financial economics and agency-theoretic logic in business education changed students’ views about diversification. Nearly 20 years later, these MBA graduates rose to top decision-making positions and put the brakes on diversification. Using data on CEOs who ran 640 large U.S. corporations from 1985 to 2015, we show that CEOs who earned an MBA before the 1970s actively pursued diversification, whereas the next cohort of CEOs, who had been exposed to agency-theoretic logic in financial economics, refrained from it. We also demonstrate that the degree of managerial discretion moderated the effect of the CEO’s MBA education. Our study shows that institutional change in one domain (i.e., business education) contributed to change in another domain (i.e., corporate diversification), albeit with a considerable time lag.

Keywords: institutional change, corporate diversification, graduate business education, managerial cognition

The decline of diversified corporations in the U.S. presents an interesting case of large-scale institutional change. Organizational scholars have documented this process through the lens of institutional theory (Fligstein, 1990; Palmer,

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Jennings, and Zhou, 1993; Davis, Diekmann, and Tinsley, 1994; Dobbin and Zorn, 2005). During the 1960s and 1970s, diversification into disparate lines of business was touted as a highly effective growth strategy, and conglomerates were considered a legitimate form of corporate organization (Fligstein, 1990). This belief changed starting in the 1980s, and growth through diversification and the conglomerate form lost its dominant status among large U.S. firms (Porter, 1987; Franko, 2004). Under pressure from investors and corporate raiders, many companies started to eschew diversifying acquisitions and instead looked to refocus on their core business. Companies that did not comply and remained diversified either suffered low market valuation or were threatened with takeover (Davis, Diekmann, and Tinsley, 1994; Zuckerman, 1999). In other words, corporate diversification was deinstitutionalized.

The process of de-diversification was slow, spanning over a decade. Skepticism about the efficacy of diversification emerged as early as the 1970s (Levy and Sarnat, 1970; Hackett, 1974), and throughout that decade, scholars and analysts marshalled theory and evidence against it (Mason and Goudzwaard, 1976; Ravenscraft and Scherer, 1987). Corporate managers also learned early on that the diversification strategy was not working, as they divested poor-performing units in unrelated businesses (Porter, 1987). Nevertheless, some firms continued to diversify well into the 1980s before the hostile takeover wave became rampant (Davis, Diekmann, and Tinsley, 1994; Montgomery, 1994; Franko, 2004), suggesting that there was considerable variation in CEOs’ willingness to abandon diversification. How CEOs see diversification is likely important in understanding the evolution of de-diversification.

To examine how CEOs’ views about diversification changed over time and how the change was related to diversification’s decline, we consider a significant historical change in a related institutional domain: graduate business education. As Khurana (2007) and Fourcade and Khurana (2013) documented, not only did graduate business education in the U.S. expand after the 1950s, but also there was an important change in what was taught in major business schools. Central to this change was the rise of financial economics and the agency-theoretic view. The related assumptions, models, and propositions would have had an enduring impact on students’ worldview. When these students became CEOs, they ran corporations differently, including making decisions on diversification, in ways consistent with the lessons they learned in business school.

The co-evolution of the two related institutional domains—business education and corporate organizations—has important implications for the pace of de-diversification. Even if graduate business programs inculcated students to view diversification and conglomeration critically, this impact would have minimal effect until these students rose in the organizational hierarchy. Hence, although criticism of diversification emerged in the early 1970s and became a mainstream view in the 1980s (Hackett, 1974; Porter, 1987), in some cases it took nearly two decades for those trained in MBA programs in the 1970s and 1980s to rise to the top and de-diversify corporations. Such an inter-domain dynamic is an important aspect of institutional change but has so far received little attention. By examining the impact of related institutional domains and the roles of actors who transmit new developments in one domain to another, we seek to address the criticism that institutional theory cannot properly explain institutional change (Oliver, 1992; Greenwood and Hinings, 1996).
BUSINESS EDUCATION, MANAGERIAL COGNITION, AND CORPORATE STRATEGY

How and why organizations choose a specific strategic action is a central issue in organizational research. The upper-echelon perspective in this research has viewed the strategic choices of an organization as a reflection of its top managers, suggesting that their cultural, psychological, and cognitive orientations are significantly related to corporate strategy and performance (Hambrick and Mason, 1984). One managerial characteristic that has received much attention is formal educational background. Research in psychology and education has demonstrated that formal education can affect values, beliefs, and cognition (Schein, 1967; Pascarella et al., 1987). Taking the upper-echelon perspective, several studies have examined the relationship between top managers’ education—both level of education and field of study—and strategic choices (Thomas, Litschert, and Ramaswamy, 1991; Wiersema and Bantel, 1992; Hambrick, Cho, and Chen, 1996; Hitt et al., 2001).

In this study, we examine how CEOs’ MBA education can affect corporate diversification. MBA education should have a strong influence on CEOs’ strategic orientation. In a behavioral simulation that measured respondents’ cognition, Priem and Rosenstein (2000) found that MBA students follow academic theories taught in business schools more closely than non-MBA students or experienced managers without an MBA. Even if executives have only a dim memory of what they learned in business schools, the assumptions and the overall worldview that underlie MBA programs can have a significant impact on their worldview (Ferraro, Pfeffer, and Sutton, 2005; Giacalone and Thompson, 2006; Slater and Dixon-Fowler, 2010).

The influence of MBA education endures long after graduation, as the concept of imprinting suggests. According to Marquis and Tilcsik (2013: 193), imprinting is “a process whereby, during a brief period of susceptibility, a focal entity develops characteristics that reflect prominent features of the environment, and these characteristics continue to persist despite significant environmental changes in subsequent periods.” This concept fits our case well. As recent studies on imprinting have highlighted, people are highly susceptible to environmental influences early in their careers (Higgins, 2005; McEvily, Jaffee, and Tortoriello, 2012; Tilcsik, 2014). Usually undertaken at an early stage of one’s career and at a relatively young age, MBA education provides a unique experience that is temporally restricted, geographically separated, and intellectually intense. A typical MBA curriculum in U.S. business schools heavily emphasizes financial analysis, portfolio management, and strategic decision making. Through such a curriculum, students acquire considerable theoretical and practical knowledge about diversification, which can have an enduring impact on their attitude toward it.

The Transformation of Business Education and the Fall of Diversified Corporations

During the second half of the twentieth century, American corporations underwent significant changes. After the Celler–Kefauver Act of 1950 prohibited mergers between firms in related businesses, firms pursued diversification into unrelated businesses. As a result, multidivisional conglomerate firms
dominated the U.S. economy in the 1960s and 1970s (Fligstein, 1990), and over half of *Fortune* 500 companies operated in three or more industries by 1980 (Davis, Diekmann, and Tinsley, 1994). Diversified corporations eventually became deinstitutionalized by the end of the 1990s. Among the largest U.S. firms, the percentage of firms with 20 percent or more of their revenues outside their main industry decreased from 36 percent in 1980 to 10 percent in 2000. During the same period, the percentage of focused firms—those with 95 percent or more of their business in their main industry—nearly doubled, from 46 to 84 percent (Franco, 2004). This dramatic turn of events, however, conceals the stickiness of diversification as an institutionalized strategy. As early as the 1970s, considerable evidence had accumulated that diversification did not result in better financial performance (Levy and Sarnat, 1970; Rumelt, 1974; Mason and Goudzwaard, 1976), yet many firms remained highly diversified for another decade or longer. Even when the conglomeration strategy began to collapse due to hostile takeovers in the 1980s, many firms fought against corporate raiders by relying on poison pills and state antitakeover laws (Davis, 1991; Davis and Thompson, 1994).

We argue that these changes in corporate diversification are closely related to parallel changes in graduate business education, a domain in which managers are trained and their views of diversification are shaped. Seemingly unrelated developments in these two institutional domains were intimately connected through a historically contingent relationship. The rise of financial economics as a dominant discipline in business schools in particular can explain how cohorts of MBA students who were exposed to a finance-heavy curriculum discarded diversification after they rose to top positions in major U.S. firms.

The 1950s and 1960s saw the field of business finance transform into financial economics and become a legitimate academic discipline. Foundational theorems and seminal propositions emerged, including modern portfolio theory (Markowitz, 1952), random walk theory (Kendall, 1953; Fama, 1965), the capital asset pricing model (Sharpe, 1963; Lintner, 1965), and the efficient market hypothesis (Fama, 1970). The mathematical and analytical rigor of the new financial economics replaced the descriptive and practical approaches of business finance. Support from large philanthropic foundations, such as the Carnegie and Ford Foundations, helped shape the new focus of business school education as rooted in discipline-based academic research (Khurana, 2007) with a particular emphasis on economics (Fourcade and Khurana, 2013). Consequently, MBA programs became significantly homogenized, with a new curriculum that emphasized economics requirements and quantitative skills. In 1964, all 64 MBA programs accredited by the American Association of Collegiate Schools of Business (AACSB) required one or more courses in accounting and finance, and most programs included at least three required quantitative courses in their core curriculum (Khurana, 2007: 276).

These programs promoted the idea of a general manager whose skills were not constrained by a particular firm or industry. This idea promoted diversification, which was thought to enable the efficient use of company resources, especially managerial skills and expertise. Articles published during the 1950s and the 1960s in the *Harvard Business Review* (*HBR*), an influential publication that bridges academic thought and business school pedagogy (e.g., Andrews, 1951; Ansoff, 1957), supported this view. Kenneth R. Andrews (1951: 95), who
popularized the concept of business strategy at Harvard Business School, wrote:

The purposeful diversification of American corporate enterprise has been accomplished with the hope of attaining greater stability in organization and earnings, greater efficiency in the use of company resources, greater economy in marketing operations, or greater returns from the exploitation of unexpected opportunity and peculiar economic conditions.

Over the course of the 1970s, this positive take on diversification was gradually replaced by skepticism. By the early 1970s, financial economics had become a firmly established discipline in academia and in business schools. Two major journals were established: the *Journal of Financial and Quantitative Analysis* in 1966 and the *Journal of Financial Economics* in 1974. During this decade, the *Journal of Finance* shifted its editorial focus toward the new financial economics (Whitley, 1986). Newly trained Ph.D.s in finance found a wide open job market, with business schools aiming to fill positions (Fourcade, Ollion, and Algan, 2015). More importantly, the 1970s witnessed the emergence of agency theory, which had a direct impact on how scholars and managers view diversified conglomerates. A group of University of Chicago–trained economists and their colleagues published seminal papers in the 1970s and early 1980s (Alchian and Demsetz, 1972; Jensen and Meckling, 1976; Fama, 1980; Fama and Jensen, 1983). Michael C. Jensen, a strong proponent of agency theory, developed an innovative agency theory course at the University of Rochester in 1973 (Jensen et al., 1997). These agency theorists viewed the maximization of shareholder value as a fundamental goal of public corporations and regarded managers as entrenched maximizers of self-interest. From their perspective, diversifying acquisitions were a managerial attempt to build a corporate empire using shareholders’ money. Articles published in *HBR* in the 1970s reflected similar agency-theoretic skepticism about conglomerate firms (e.g., Hackett, 1974; Salter and Weinhold, 1978).

In the 1980s, financial economics and agency theory became a mainstream paradigm that dominated both academia and practice. In a pro-market environment characterized by the deregulation of financial markets and the rise of hostile takeovers, business school scholars and management thinkers increasingly criticized conglomerate firms and hailed the virtues of refocusing on core competencies. Jensen, who joined the Harvard Business School faculty in 1985, actively promulgated an agency-theoretic view outside academia through media publications (VerMeulen, 1985; Jensen 1987, 1989a), while continuing to publish in major academic journals and teaching a highly popular course on agency theory (Jensen et al., 1997). Jensen’s colleagues and students started to teach similar courses at other schools, including the University of Chicago and the University of Southern California, where the agency-theoretic view was integrated into the MBA curriculum (Khurana, 2007). *HBR* published several important articles that advocated the core tenets of agency theory (e.g., Rappaport, 1981; Jensen, 1984, 1989b; Fogg, 1985).

To see how curricula were evolving as part of a large-scale trend across all MBA programs, we examined various editions of *Barron’s Guide to Graduate Business Schools*. Published periodically since 1978, this practical guide for MBA applicants provides a comprehensive list of virtually all MBA programs
and their key characteristics. In 1978, 72 percent of MBA programs required courses in finance for an MBA degree. This number grew to 90 percent in 1988 and 92 percent in 1995. Similarly, courses in accounting became required in almost all MBA programs: at 77 percent of MBA programs in 1978, 89 percent in 1988, and 95 percent in 1995. Considering that course requirements in finance and accounting represent the program’s focus and priorities, this trend reflects the changes in business education that we described above.

Given these historical changes in business education, we expect that the relationship between MBA education and corporate diversification would have changed over time. Although financial economics emerged as an important subject in business schools in the 1960s, it had not yet developed a critical view of diversification and conglomerate firms. Instead, financial and quantitative skills taught at business schools at that time were seen as useful for planning and executing diversification (Fligstein, 1990; Davis, Diekmann, and Tinsley, 1994). The situation began to change in the 1970s as financial economic researchers theorized and gathered evidence showing that conglomerate firms performed poorly. The skepticism about diversification developed into harsh criticism in the 1980s as agency theory began to dominate. Agency theorists regarded diversifying acquisitions as a quintessential example of managerial opportunism: managers pursue diversifying acquisitions because they increase a firm’s size and reduce managers’ risk of unemployment, both of which are often tied to managerial compensation (Jensen, 1986). We therefore predict:

Hypothesis 1a (H1a): Having a CEO who received an MBA before the 1970s is positively related to the level of diversifying acquisition activity.

Hypothesis 1b (H1b): Having a CEO who received an MBA in or after the 1970s is negatively related to the level of diversifying acquisition activity.

Moderating Effect of Managerial Discretion

Several factors can moderate the hypothesized relationship between CEOs’ MBA education and corporate diversification. We focus here on managerial discretion, which can determine the degree to which top managers’ influence on corporate outcomes is realized or constrained (Marquis and Lee, 2013). Top managers have a strong incentive to engage in diversification because, unlike investors who can diversify their portfolios, managers’ fortunes are tied to those of their firms (Amihud and Lev, 1981). Diversification spreads the risk of firms’ failure and helps top managers entrench themselves (Shleifer and Vishny, 1989). Therefore they will be tempted to engage in diversifying acquisitions even though such acquisitions may depress the firm’s market value (Lang and Stulz, 1994; Berger and Ofek, 1995; Comment and Jarrell, 1995). We

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1 These percentages are based on raw counts of MBA programs each year. When the counts are weighted by the number of CEOs in our sample, the pattern is similar. MBA programs that require finance courses increased from 80 percent in 1978, to 88 percent in 1988, and 97 percent in 1995. Accounting courses were required in 49 percent of MBA programs in 1978, in 61 percent in 1988, and in 99 percent in 1995. Many CEOs in our sample had MBAs from elite programs such as Harvard (148 CEOs, or 23.1 percent of the sample), the University of Chicago (38 CEOs, or 5.9 percent), and the Wharton School at the University of Pennsylvania (30 CEOs, or 4.7 percent), all of which were early adopters of a finance-oriented MBA curriculum.
suggest that the level of managerial discretion can moderate the impact of a CEO’s MBA education on corporate diversification. When the CEO enjoys decision-making autonomy, a firm’s acquisition decisions will more strongly reflect the CEO’s views about diversification than when the CEO lacks such autonomy. Several factors can affect the level of managerial discretion, all closely related to the firm’s corporate governance.

**Internal and external monitoring of top managers.** Both internal and external monitoring of top managers can constrain managerial discretion (Walsh and Seward, 1990). The primary internal monitoring mechanism is the board of directors, whose fundamental role is to represent shareholders’ interests. Monitoring by boards, especially those dominated by independent, outside directors, can reduce top managers’ opportunistic behavior, whereas ineffective board monitoring can encourage such behavior (Mizruchi, 1983; Kosnik, 1987; Gordon, 2007). Agency theorists have attributed the persistence of value-depressing acquisitions to the failure of board monitoring (Jensen, 1993; see also Morck, Shleifer, and Vishny, 1989). Effective monitoring by outsider-dominated boards should discourage CEOs from pursuing diversification and reduce the salience of their views. We thus hypothesize that board monitoring will reinforce the negative relationship between diversification and CEOs’ MBA education in or after the 1970s. Compared with other CEOs, those who received an MBA after the transition to agency logic may be less resistant to board monitoring to protect shareholders’ interests and therefore more likely to refrain from diversification when their decisions are monitored by outsider-dominated boards:

**Hypothesis 2 (H2):** The negative relationship between having a CEO who received an MBA in or after the 1970s and the level of diversifying acquisition activity is stronger when the proportion of outside directors on the board is higher.

External monitoring of top managers by investors can also constrain managerial discretion. Institutional investors often play the role of such external monitors (Davis and Thompson, 1994; Useem, 1996). In particular, those who own a significant portion of a firm’s stock have both the power and incentive to closely monitor top managers. Their large holding size gives blockholding investors a say in managerial decisions and makes it difficult if not impossible for them to vote with their feet by selling the shares that are part of their investment portfolios (Coffee, 1991). Previous studies have shown that monitoring by blockholding institutional investors reduces top managers’ self-serving activities (Shleifer and Vishny, 1986; Tosi and Gomez-Mejia, 1989; Hartzell and Starks, 2003; Chen, Harford, and Li, 2007). The increased influence of blockholding institutional investors since the 1980s can constrain managerial discretion and weaken a CEO’s effect on the firm’s diversification decisions. As in the case of board monitoring, we hypothesize that blockholder monitoring will strengthen the negative relationship between diversification and CEOs’ MBA education in or after the 1970s. Whereas top managers previously resisted external constraints on their decision-making autonomy, those trained under the premise of agency logic, with its focus on maximizing returns to
shareholders, may be more receptive to the monitoring efforts of large inves-
tors and avoid diversification.

**Hypothesis 3 (H3):** The negative relationship between having a CEO who received
an MBA in or after the 1970s and the level of diversifying acquisition activity is
stronger when the proportion of shares controlled by blockholding institutional
investors is higher.

**CEO power.** A CEO’s power in the firm should have the opposite effect on
managerial discretion; everything else being equal, powerful CEOs should
enjoy greater decision-making autonomy in their firms. Such CEOs can often
exert significant influence over the selection of board members and their suc-
cessors, further consolidating their influence in the firm (Cannella and Lubatkin,
1993; Zajac and Westphal, 1996). As a result, they will be less vulnerable to
either internal or external pressure and more capable of pushing their own
agendas (Harrison, Torres, and Kukalis, 1988; Wade, O’Reilly, and Chandratat,
1990; Westphal and Zajac, 2001). For this reason, when the CEO has a strong
power base in the firm, the CEO’s views and preferences will play a bigger role
in shaping the firm’s strategic decisions. We expect this positive moderating
effect of CEO power to be contingent on the timing of the CEO’s business
education: a CEO’s power will increase the positive relationship between diver-
sification and the CEO’s MBA education if the MBA was obtained before the
1970s. CEOs who received MBAs before the transition to agency logic may
not embrace the agency-theoretic financial orthodoxy that investors, not man-
gagers, should diversify and therefore will be more likely to pursue diversification
when their decision-making power allows them to do so:

**Hypothesis 4 (H4):** The positive relationship between having a CEO who received an
MBA before the 1970s and the level of diversifying acquisition activity is stronger
when the CEO has more power in the firm.

**METHOD**

**Sample**

To test our arguments, we used a sample of publicly traded, non-financial firms
in the U.S. from 1985 to 2015. We combined two separate samples represen-
tative of the largest firms. For the period from 1985 to 2005, we sampled a
roughly equal number of firms from each of the 23 industries represented by
the Fortune 500 list of America’s largest firms.\(^2\) We randomly selected one
company name from each industry in each year during the period. In this way,
our sample includes firms in both growing (e.g., computers) and declining (e.g.,
textiles) industries. Several industries, such as utilities and retail and wholesale,
were not part of the Fortune 500 list until 1994. For these industries before
1994, we used Fortune lists of the 50 or 100 largest firms in those industries.

\(^2\) Aerospace; Apparel & Leather; Automobile & Transportation Equipment; Building Materials;
Chemicals; Communications; Computer; Electrical Machinery; Entertainment; Food & Tobacco;
Healthcare; Machinery; Metal & Metal Products; Mining, Oil Extraction & Construction; Paper &
Wood Products; Petroleum Refining; Pharmaceuticals; Publishing; Retail & Wholesale; Service;
Textiles; Transportation; and Utilities.
When we excluded these industries and ran the analysis (results available upon request), the substantive findings were similar to those reported here. For the period from 2006 to 2015, we used all non-financial firms in the S&P 500 list. We combined these two samples and tracked the firms in the 1985–2005 sample forward after 2005 and those in the 2006–2015 sample backward until 1985. After removing duplicated cases and those with missing values, we had 847 firms. The actual number of firms we used for analysis is smaller, 640 firms, because of the stratification on firms in the event history analysis, which we describe in detail in the Statistical Analysis subsection below. Table A1 in the Online Appendix (http://journals.sagepub.com/doi/suppl/10.1177/0001839218768520) presents the number of sampled firms by industry. We obtained data on the sampled firms and their CEOs from various sources, including the *Marquis Who’s Who Biographies Database*, Standard & Poor’s *Register of Corporations, Directors, and Executives*, and Compstat. Whenever possible, we updated the data at quarterly intervals, but several variables, especially CEO characteristics, were updated annually.

**Outcome Variable: Diversifying Acquisitions**

Our outcome variable is the rate of diversifying acquisitions. To calculate the rate, we collected information on the timing of acquisition deals announced by firms in our sample from SDC Platinum’s Mergers and Acquisitions database. Acquisitions are regarded as diversifying ones when the acquiring firm’s industry differs from that of the acquired firm or asset at the two-digit Standard Industrial Classification (SIC) level. Because we used the timing of announcements, it is possible that some of the announced acquisition deals were not completed. For about 15 percent of the announced acquisition deals, SDC Platinum does not provide completion dates. As a robustness check, we ran models using the timing of completion, and the results are similar to the results using the timing of announcement, as shown in table A2 in the Online Appendix.  

**Explanatory and Moderating Variables**

Our key explanatory variables to test H1a and H1b are indicator variables for CEOs who received an MBA degree at different historical periods. We did not consider undergraduate business degrees (e.g., Bachelor of Business Administration) or certificates of executive programs for senior managers (e.g., Harvard Business School’s Advanced Management Program). We collected data on CEOs’ MBA education primarily from the *Who’s Who* database, supplemented by *BusinessWeek*’s executive database and newspaper articles. From these sources, we also identified the year when the CEO received an MBA. Using this information, we constructed three indicator variables, for CEOs who earned an MBA before the 1970s (MBA60), in the 1970s (1971–1980; MBA70), or after the 1970s (MBA80). This periodization captures historical changes in the dominant academic view on diversification, from a generally positive view on diversified corporations as an efficient organizational form in the 1950s and the 1960s to growing skepticism in the 1970s, and finally to a

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3 Instead of the rate of acquisition announcements, one could analyze the value of acquisition transactions. This option is less feasible because SDC Platinum does not provide information on transaction value for more than half of the cases.
critical agency-theoretic view in the 1980s and later. Figure 1 shows that in our sample the percentage of CEOs with an MBA degree steadily increased throughout the 1980s and the 1990s from 20 percent to 33 percent and remained at that level throughout the 2000s.

We included interaction terms of these MBA indicator variables with a set of moderating factors to test hypotheses 2 through 4. First, we measured the effectiveness of board monitoring by the percentage of outside directors—those directors not employed by the firm (e.g., senior executives)—on the board. We collected this information from Standard & Poor’s Register. Second, we measured the effectiveness of institutional-investor monitoring by the percentage of a given firm’s stock owned by all blockholding institutional investors, each of whom held at least 5 percent of the firm’s stock. We collected this information from Thomson Financial’s institutional ownership database. Finally, we measured CEO power using two variables. One is an indicator variable for CEO duality: when the same person holds both the CEO and board chair positions. This is a common measure of CEO power in previous studies (Harrison, Torres, and Kukalis, 1988; Cannella and Lubatkin, 1993). Another measure of CEO power is the CEO’s tenure in that position. Previous studies have suggested that the longer a CEO stays in the position, the more intra-organizational power he or she will accumulate (Pfeffer, 1981; Hambrick and Fukutomi, 1991). We collected data for both measures from Standard & Poor’s Register.

Control Variables
We controlled for several factors that can influence the rate of diversifying acquisitions. First, we included the CEO’s age and tenure with the firm. Controlling for these two variables addresses the concern that the effect of the CEO’s business education, especially for those who received an MBA during
earlier periods, may simply capture the effect of their age or long tenure with the firm. We collected the data from Standard & Poor’s Register. We also controlled for CEOs’ functional background in finance, which may affect their propensity to engage in diversifying acquisitions (Fligstein, 1990; Jensen and Zajac, 2004). Those CEOs typically served in various finance- or accounting-related positions, such as controller, treasurer, or chief financial officer. We collected information about CEOs’ prior career history from the Who’s Who database. We controlled for the firm’s prior level of diversification using the previous year’s entropy index of diversification, calculated as $\Sigma p_i \ln(1/p_i)$, where $p_i$ is the proportion of the firm’s sales made in segment $i$ (Palepu, 1985). Segment sales data were collected from Compustat’s segment database. In addition to blockholding institutional ownership, we controlled for ownership by non-blockholding institutional investors: those who own less than 5 percent of the firm’s stock. Ownership by both types of investors does not sum up to 100 percent because of the portion owned by individual (or “retail”) investors. We included two measures of firm performance: returns on assets (ROA) for operating performance and cumulative stock returns (percent change in share price over the previous three months) for stock-market performance. We calculated ROA using data from Compustat and cumulative stock returns using monthly stock returns data from the Center for Research in Stock Prices (CRSP) database. We included debt-to-equity ratio as a measure of the firm’s debt burden. We measured firm size by the firm’s total assets, log-transformed because of its severe skewness. Data for both debt to equity and firm size were collected from Compustat.

In addition to firm-level factors, we included several measures of sectoral and macro-institutional factors. First, to account for within-industry imitation (Marquis and Tilcsik, 2016), we included a density measure of diversifying acquisitions, calculated as the percentage of firms in the focal firm’s industry (minus the focal firm) that made an acquisition announcement in the previous quarter. Second, we included a measure of antitrust enforcement by the government, because lax enforcement allowed more acquisitions within the same industry and therefore could reduce diversifying acquisitions (Fligstein, 1990; Davis, Diekmann, and Tinsley, 1994; Stearns and Allan, 1996). We measured this variable using the percentage of transactions in a given year for which either the Federal Trade Commission (FTC) or the Antitrust Division of the Department of Justice initiated a second-request investigation. Both agencies can request additional information from parties involved in a transaction when they have reason to believe that the transaction may have anticompetitive consequences. Some cases will eventually lead to formal complaints and, if necessary, litigation. We collected data on second requests from the agencies’ annual reports. Third, we included a measure of the threat of hostile takeovers. Previous studies have shown that takeover threats discouraged firms from engaging in diversifying acquisitions (Davis, Diekmann, and Tinsley, 1994). We used the hazard rate of hostile takeovers in any given year estimated by Cain, McKeon, and Solomon (2017), who used data on all acquisition deals targeting U.S. publicly traded companies, except those in regulated industries such as banking. Finally, to account for unmeasured secular trends in the rate of diversifying acquisitions, we included a lowess (locally weighted scatterplot smoothing) function of calendar time. The lowess function provides a more flexible approach to handle time dependence than either a linear or quadratic function,
by estimating the relationship between the rate and calendar time at multiple points in time (Beck and Jackman, 1998).

Table A3 in the Online Appendix presents descriptive statistics and bivariate correlations. All of our explanatory, moderating, and control variables are lagged so that they reflect the conditions in either the previous quarter or year, depending on their interval.

Statistical Analysis

We used the Cox proportional hazards regression model, which is most commonly used for continuous-time event history analysis (Allison, 1995). An important merit of this semi-parametric model is that, unlike parametric models, it does not assume a particular functional form of duration dependence—how the baseline rate changes over the course of event time. Because we know the exact date of each announcement, our duration metric is day. We adopted a gap-time approach and defined event spell as the time interval between events (Box-Steffensmeier and Jones, 2004), resetting the clock to zero once a firm made an acquisition announcement. As most firms made acquisition announcements more than once during our observation period, there may be multiple event spells for the same firm.

The repeatability of events and the resulting issue of dependence among event spells from the same firm are handled with stratification on firms. This procedure allows each firm to have a unique baseline rate, which is conceptually analogous to adding fixed effects to ordinary regression models (Allison, 2005). Likewise, the Cox model with stratification shares both the strengths and weaknesses of fixed-effects models. Although it provides a more stringent hypothesis test by controlling for all time-invariant, firm-specific characteristics, it drops firms with a single right-censored event spell—those that never engaged in diversifying acquisitions during the observation period—as well as firms with one censored spell and one uncensored spell, if the former is shorter than the latter (Allison, 2005: 116). There are 207 such firms, which were excluded from the estimation. In the end, we analyzed 9,119 event spells from 640 firms. Among them, 804 event spells are right-censored, meaning that the spells ended without an acquisition announcement. The first event spell of each firm was left-truncated unless the firm was founded before 1985. For those cases, we traced their history of acquisition activity before 1985, but this was done only up to 1980.4 For those 182 event spells, we set their beginning to January 1, 1980. Finally, tied events were handled using the Efron method (Efron, 1977).

RESULTS

Table 1 presents the results of our event history analysis of diversifying acquisition announcements. The first column contains the baseline model with only moderating and control variables, most of which have an expected effect. Internal monitoring by the board of directors and external monitoring by blockholding institutional investors are negatively associated with the rate of

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4 SDC Platinum’s mergers and acquisitions database covers acquisitions in the U.S. from 1979, but the coverage seems incomplete in that year, with only 24 cases reported.
Table 1. Event History Analysis of Diversifying Acquisition Announcements

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<th>Variable</th>
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<td>MBA</td>
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<td></td>
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</tr>
<tr>
<td>MBA60</td>
<td>.159**</td>
<td>(.050)</td>
<td>.153**</td>
<td>.212***</td>
<td>.181*</td>
<td>−.057</td>
<td>.101</td>
<td></td>
</tr>
<tr>
<td>MBA60 × % Outside directors</td>
<td>.007*</td>
<td>(.003)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBA60 × Blockholding</td>
<td>.015***</td>
<td>(.004)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBA60 × CEO/chair</td>
<td>−.031</td>
<td>(.092)</td>
<td>−.146</td>
<td>−.148</td>
<td>−.057</td>
<td>.101</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBA60 × CEO tenure</td>
<td>.026***</td>
<td>(.006)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MBA70</td>
<td>−.273***</td>
<td>(.054)</td>
<td>−.116</td>
<td>−.273***</td>
<td>−.319***</td>
<td>−.262***</td>
<td>−.270***</td>
<td></td>
</tr>
<tr>
<td>MBA70 × % Outside directors</td>
<td>−.018***</td>
<td>(.005)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>MBA70 × Blockholding</td>
<td>−.012**</td>
<td>(.004)</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>MBA70 × CEO/chair</td>
<td>.064</td>
<td>(.099)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>MBA70 × CEO tenure</td>
<td>−.001</td>
<td>(.010)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>MBA80</td>
<td>−.352***</td>
<td>(.062)</td>
<td>−.053</td>
<td>−.336***</td>
<td>−.374***</td>
<td>−.366***</td>
<td>−.167</td>
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<tr>
<td>MBA80 × % Outside directors</td>
<td>−.030***</td>
<td>(.006)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>MBA80 × Blockholding</td>
<td>.007</td>
<td>(.005)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>MBA80 × CEO/chair</td>
<td>.037</td>
<td>(.107)</td>
<td></td>
<td></td>
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<tr>
<td>MBA80 × CEO tenure</td>
<td>.001</td>
<td>(.011)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>% Outside directors</td>
<td>−.006***</td>
<td>(.001)</td>
<td>−.006***</td>
<td>−.005**</td>
<td>−.003*</td>
<td>−.005**</td>
<td>−.005**</td>
<td>−.005**</td>
</tr>
<tr>
<td>Blockholding institutional</td>
<td>−.012***</td>
<td>(.002)</td>
<td>−.012***</td>
<td>−.011***</td>
<td>−.011***</td>
<td>−.012***</td>
<td>−.012***</td>
<td>−.013***</td>
</tr>
<tr>
<td>ownership</td>
<td>(.002)</td>
<td>(.002)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CEO/chair duality</td>
<td>.197***</td>
<td>(.036)</td>
<td>.195***</td>
<td>.189***</td>
<td>.190***</td>
<td>.194***</td>
<td>.182***</td>
<td>.196***</td>
</tr>
<tr>
<td>CEO tenure</td>
<td>.015***</td>
<td>(.003)</td>
<td>.016***</td>
<td>.014***</td>
<td>.016***</td>
<td>.014***</td>
<td>.014***</td>
<td>.009**</td>
</tr>
<tr>
<td>Diversification:</td>
<td>.042***</td>
<td>(.002)</td>
<td>.044**</td>
<td>.045**</td>
<td>.045**</td>
<td>.045**</td>
<td>.045**</td>
<td>.045**</td>
</tr>
<tr>
<td>entropy index</td>
<td>.291***</td>
<td>(.041)</td>
<td>.296***</td>
<td>.296***</td>
<td>.296***</td>
<td>.299***</td>
<td>.297***</td>
<td>.301***</td>
</tr>
<tr>
<td>CEO age</td>
<td>−.008**</td>
<td>(.003)</td>
<td>−.009**</td>
<td>−.012***</td>
<td>−.010***</td>
<td>−.012***</td>
<td>−.012***</td>
<td>−.011***</td>
</tr>
<tr>
<td>Firm tenure</td>
<td>.007***</td>
<td>(.002)</td>
<td>.006***</td>
<td>.006***</td>
<td>.006***</td>
<td>.006***</td>
<td>.006***</td>
<td>.005**</td>
</tr>
<tr>
<td>Non-blockholding inst.</td>
<td>−.004**</td>
<td>(.001)</td>
<td>−.004**</td>
<td>−.004**</td>
<td>−.004**</td>
<td>−.004**</td>
<td>−.004**</td>
<td>−.004**</td>
</tr>
<tr>
<td>ownership</td>
<td>(.001)</td>
<td>(.001)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stock returns</td>
<td>.183***</td>
<td>(.062)</td>
<td>.183***</td>
<td>.183***</td>
<td>.184***</td>
<td>.181**</td>
<td>.183**</td>
<td>.184**</td>
</tr>
<tr>
<td>Return on assets</td>
<td>.042***</td>
<td>(.007)</td>
<td>.042***</td>
<td>.042***</td>
<td>.042***</td>
<td>.042***</td>
<td>.042***</td>
<td>.041***</td>
</tr>
<tr>
<td>Debt to equity</td>
<td>−.127***</td>
<td>(.014)</td>
<td>−.125***</td>
<td>−.123***</td>
<td>−.119***</td>
<td>−.123***</td>
<td>−.122***</td>
<td>−.119***</td>
</tr>
</tbody>
</table>

(continued)
diversifying acquisitions, while both CEO duality and CEO tenure are positively associated. As for other control variables, ownership by non-blockholding institutional investors, CEO age, and debt burden are negatively associated with the rate, while the prior level of diversification, the CEO’s tenure with the firm, firm performance, firm size, and within-industry density of diversifying acquisitions are positively associated. Among the macro-institutional factors, the level of antitrust enforcement is negatively associated with the rate.

Model 1 in table 1 includes an indicator variable for CEOs who received an MBA, regardless of when they received the degree. The coefficient is negative and statistically significant. Model 2, however, shows that the timing of MBA education matters, which supports our hypotheses about the historically contingent effect of business education (H1a and H1b). Compared with CEOs without an MBA, CEOs who earned an MBA before the 1970s are significantly more likely to engage in diversifying acquisitions. In contrast, CEOs who earned an MBA in or after the 1970s are significantly less likely to engage in diversification. Having the former type of CEO increases a firm’s rate of diversifying acquisitions by 17 percent, and having the latter two types decreases the rate by 24 and 30 percent, respectively. These results support our argument that the predominant logic of business education when the CEO attended an MBA program has a distinct influence on the CEO’s strategic orientation. CEOs who received business education before the rise of financial economics and agency-theoretic logic remained favorable toward diversification, whereas later generations embraced an agency-theoretic view against diversification.

Table 1. (continued)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total assets</td>
<td>.312***</td>
<td>.317***</td>
<td>.354***</td>
<td>.354***</td>
<td>.352***</td>
<td>.354***</td>
<td>.353***</td>
<td>.348***</td>
</tr>
<tr>
<td>(0.021)</td>
<td>(0.021)</td>
<td>(0.022)</td>
<td>(0.022)</td>
<td>(0.022)</td>
<td>(0.022)</td>
<td>(0.023)</td>
<td>(0.023)</td>
<td></td>
</tr>
<tr>
<td>Acquisition announcement density</td>
<td>.416***</td>
<td>.420***</td>
<td>.416***</td>
<td>.420***</td>
<td>.420***</td>
<td>.416***</td>
<td>.417***</td>
<td>.420***</td>
</tr>
<tr>
<td>(0.023)</td>
<td>(0.024)</td>
<td>(0.024)</td>
<td>(0.024)</td>
<td>(0.024)</td>
<td>(0.024)</td>
<td>(0.024)</td>
<td>(0.024)</td>
<td></td>
</tr>
<tr>
<td>Hostile takeover rate</td>
<td>.121</td>
<td>.142</td>
<td>.295</td>
<td>.326</td>
<td>.293</td>
<td>.289</td>
<td>.277</td>
<td>.276</td>
</tr>
<tr>
<td>(0.231)</td>
<td>(0.231)</td>
<td>(0.233)</td>
<td>(0.233)</td>
<td>(0.233)</td>
<td>(0.233)</td>
<td>(0.233)</td>
<td>(0.234)</td>
<td></td>
</tr>
<tr>
<td>Antitrust enforcement</td>
<td>–.052***</td>
<td>–.050***</td>
<td>–.040**</td>
<td>–.037*</td>
<td>–.042**</td>
<td>–.040**</td>
<td>–.039**</td>
<td>–.039**</td>
</tr>
<tr>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td>(0.015)</td>
<td></td>
</tr>
<tr>
<td>Lowess function of time</td>
<td>.057***</td>
<td>.059***</td>
<td>.065***</td>
<td>.057***</td>
<td>.063***</td>
<td>.065***</td>
<td>.063***</td>
<td>.056***</td>
</tr>
<tr>
<td>(0.012)</td>
<td>(0.012)</td>
<td>(0.012)</td>
<td>(0.012)</td>
<td>(0.012)</td>
<td>(0.012)</td>
<td>(0.012)</td>
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</tr>
</tbody>
</table>

* p < .05; ** p < .01; *** p < .001; two-tailed t tests.

For all models, number of firms = 640; number of quarterly spells = 61,508; number of announcements = 8,315.

5 (exp(0.159)–1) × 100.
6 The reduced diversifying acquisitions that we found under CEOs who earned an MBA after 1970 could have been due to deregulation since the late 1970s that allowed more mergers within the same industry. We tested this possibility by interacting MBA variables and industry dummy variables for deregulated industries—Oil & Natural Gas, Telecommunications, Transportation, and Utilities (for more information about deregulated industries, see Ovtchinnikov, 2010). None of the interaction effects was statistically significant, suggesting that the negative effect of post-1970 MBA education was not driven by deregulation. The results are available upon request.
Next, we considered the effects of moderating factors. We found evidence of the hypothesized negative moderating effect of board monitoring for CEOs who received an MBA in or after the 1970s. In model 3, such CEOs are much less likely to engage in diversifying acquisitions as the percentage of outside directors on the board increases, which is consistent with H2. In contrast, the moderating effect of board monitoring for CEOs who earned an MBA before the 1970s is significantly positive, though the effect size is small. This suggests that such CEOs were barely constrained by board monitoring when making acquisition decisions. Figure 2 illustrates the moderating effect of board monitoring.

There is evidence for a similar moderating effect of external monitoring by blockholding institutional investors for CEOs who received an MBA in the 1970s. In model 4, those CEOs are much less likely to engage in diversifying acquisitions as stock ownership by blockholders increases, which is consistent with H3. But we do not find a similar moderating effect for CEOs who received an MBA after the 1970s. Such CEOs refrained from diversifying acquisitions regardless of blockholder monitoring. As with board monitoring, blockholder monitoring failed to discourage those CEOs who received an MBA before the 1970s from engaging in diversifying acquisitions, as shown in figure 3.

Finally, there is some evidence for the positive moderating effect of CEO power. Although there is no significant moderating effect of CEO duality in model 5, there is a significantly positive moderating effect of CEO tenure in

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Figure 2. Moderating effect of board monitoring.
model 6. Consistent with H4, this positive moderating effect of CEO tenure is observed only for CEOs who received an MBA before the 1970s. Early on in their tenure as CEO, they were less likely to engage in diversification than CEOs without an MBA, but as they continued in their position, they became more likely to do so; see figure 4. The substantive findings remain unchanged when all interaction variables are entered simultaneously in model 7.

Robustness Checks

Propensity score matching and instrumental variables. We adopted quasi-experimental methods to address issues of reverse causality and unobserved heterogeneity. Clearly, firms do not just pick CEOs randomly. Certain firms are more likely to select a CEO with an MBA; see Online Appendix table A4 for a comparison of firm and CEO characteristics by CEO’s educational background. It might be the case that firms that intended to diversify hired CEOs with an MBA. If such an intention is not fully accounted for, the estimated effect of MBA education can be inconsistent. Given these concerns, it is difficult to claim that our models correctly capture the exact causal effect of MBA education on diversification behavior. To move closer to a causal estimate of the effect, we used propensity score matching and instrumental variables (IVs). Each method has known limitations. Propensity score matching assumes that treatment assignment is random after conditioning on all observed characteristics (Morgan and Winship, 2007). If the assumption does not hold, the estimated treatment effect can be inconsistent. Instrumental variables adjust for both observed and unobserved confounders, but reliable implementation of an
IV requires that the instrument causes variation in the treatment variable but not in the outcome variable (Angrist and Pischke, 2009). When either of two conditions is not met, IV estimates can be inconsistent.

We implemented both propensity score matching and IV estimation. First, we constructed a set of matched samples using propensity score matching and replicated model 2 of table 1. This approach allowed us to compare CEOs who earned an MBA with CEOs who did not earn an MBA but have otherwise similar characteristics. In this way, the remaining differences in the acquisition behavior of the two groups can be attributed to the effect of MBA education. We used nearest neighbor matching (Morgan and Winship, 2007). We first estimated the propensity score that newly appointed CEOs have an MBA, using a logit model based on their individual and firm characteristics at the time of their appointment. We matched each CEO with an MBA to another CEO without the degree but with the closest propensity score. The matching was done without replacement so that there was one control case for one treatment case. We then divided MBA CEOs into three cohorts. Additionally, we separately implemented this matching procedure for each cohort of MBA CEOs and constructed three pairs of matched samples. In all, we constructed four pairs of matched samples. Online Appendix table A5 presents the list of covariates we used to calculate the propensity score. T-tests comparing the means of the

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8 When estimating the propensity score, we included, in addition to variables that are already in our main event history models, a variable that would explain a firm’s decision to appoint an MBA CEO but not its decision to diversify (the proportion of MBA CEOs in the firm’s industry), as well as variables that would explain the latter decision (asset-divestiture announcements and media coverage of diversification). These additional variables would help ensure that the remaining difference after matching is attributable to factors that are orthogonal to the firm’s decision to diversify. See Online Appendix table A5 for more information about these variables.
treatment group (CEOs with an MBA) and the control group (CEOs without an MBA) show that the observed characteristics are not significantly different between the two groups, with one exception: the average year of birth is about one year different between CEOs who earned an MBA in the 1970s and those who did not. Online Appendix table A6 presents Cox regression models using matched samples. The effects of MBA education are similar to those in table 1: positive before the 1970s and negative afterward.

Second, we replicated model 2 using three instrumental variables. Our first two IVs capture the availability of MBA students in the labor market around the beginning of the CEO’s career. One is the ratio of MBA graduates to the number of all undergraduate graduates in the U.S. for the year when the CEO earned an MBA (for those with an MBA) or an undergraduate degree (for those without an MBA). Years later, this ratio will determine the availability of MBA holders among contenders for the top position who are in the same cohort, which will affect the firm’s likelihood of appointing a CEO with an MBA. It is unlikely that the availability of MBA graduates two decades earlier affects a firm’s diversification strategy. Based on a similar idea, our second instrumental variable is an indicator variable for CEOs who graduated from college during an economic recession. It is well known that more people apply to MBA programs when there is a recession. We calculated the ratio of MBA graduates using data from various sources, including the National Center for Education Statistics, “Earned Degrees Conferred,” 1955–56 through 1963–64; Higher Education General Information Survey (HEGIS), “Degrees and Other Formal Awards Conferred” surveys, 1965–66 through 1985–86; Integrated Postsecondary Education Data System (IPEDS), “Completions Survey” (IPEDS-C:87-99), and IPEDS Fall 2000 through Fall 2012. We used the National Bureau of Economic Research’s (NBER) Business Cycle Expansion and Contraction data to identify recessionary periods.

The last instrumental variable we used is the proportion of female directors with an MBA among all directors with an MBA in the focal firm’s industry at the time of the CEO’s appointment. We calculated the proportion using information on all directors at U.S. corporations available from the BoardEx database, which provides biographical information on corporate directors. A well-documented finding in the sociological literature on the gender wage gap suggests that as the proportion of women in an occupation increases, the average wage in the occupation tends to decline because of a cultural bias that devalues “women’s work” (England, 1992; Cohen and Huffman, 2003). As increasingly more women earned an MBA and entered the corporate elite labor market, indicated by the prevalence of female directors with an MBA (Terjesen, Sealy, and Singh, 2009; Patterson, Damase, and Sheroff, 2017), we suspect that the relative advantages MBA holders enjoy in the CEO labor market might have changed accordingly, which is likely to affect a firm’s likelihood of hiring a CEO with an MBA but not its diversification strategy.

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*Available at http://www.nber.org/cycles/ (last retrieved on September 12, 2017).*

*We conducted tests for weak instruments using the first-stage F-statistic. The test assesses whether our instrument is significantly correlated with our explanatory variables of MBA education. In all three cases, the F-statistic is much higher than 10, a threshold for weak instruments (Staiger and Stock 1997; Bascle 2008).*
Online Appendix table A7 presents our results using the instrumental variables. There are three models because we separately instrumented each cohort of MBA CEOs. As the instrumental variables approach is not well established for continuous-time event history analysis, we converted the dataset to a discrete-time quarterly format. As the ultimate dependent variable (diversifying acquisition) is dichotomous, we estimated instrumental variables with probit regression. To address dependence among spells from the same company, we used robust standard errors. The results in table A7 suggest that the effects of MBA education are qualitatively similar to those in table 1.

Variations across business schools. Our measure of historical changes in business education is based on the timing of the CEO’s MBA education. Without more detailed information about the curriculum at each of the business schools, it is challenging to demonstrate exactly how the business education curriculum—and agency-theoretic logic in particular—had an effect. To address this concern, we used the fact that almost one quarter of all CEOs with an MBA in our sample received their degrees from the Harvard Business School (HBS), where Michael C. Jensen, arguably the most prominent agency theorist, taught beginning in 1985. At HBS, Jensen was widely known as a distinctively influential teacher devoted to the dissemination of agency-theoretic logic to MBAs (Jensen et al., 1997; Khurana, 2007). Hence it is likely that MBA students who graduated from HBS in 1986 or after were exposed to his agency-theoretic view on corporate governance in general and his criticism of diversifying acquisitions in particular. Given his role in popularizing agency theory, we expect that being exposed to his teaching had an enduring effect on students’ views on diversification and their acquisition behavior when they became CEOs. To test this hypothesis, we divided HBS-educated CEOs into two groups—those who went to HBS before and after 1986—and compared their acquisition behaviors. Table 2 presents the Cox regression results. The first model includes only HBS-educated CEOs and compares the two cohorts (pre- versus post-1986). It shows that those who graduated from HBS in or after 1986—i.e., after Jensen joined the school—are significantly less likely to engage in diversifying acquisitions. In subsequent models, we compared HBS-educated CEOs with those who went to other business schools. HBS education still has a strong negative effect only after Jensen’s arrival. We also divided CEOs who went to other business schools into two groups: pre- versus post-1986. Among non-HBS MBAs, we do not observe a similar change in acquisition behavior around the 1986 cut-point. The switch in acquisition behavior is unique among post-1986 HBS MBAs, which is consistent with our argument that the arrival of an influential agency theorist at the elite business program had a lasting impact on the graduates’ behaviors. Control variables are omitted from table 2 to conserve space; for full results, see table A8 in the Online Appendix.

In addition, we used the rankings of finance departments in business schools to test our argument that being exposed to modern financial economics was a crucial factor in altering MBA graduates’ views of diversification. Schools whose faculty members actively published in top finance journals were likely to have a finance-heavy MBA curriculum reflecting the up-to-date paradigm in the mainstream finance scholarship. We therefore expected that the negative effect of MBA education on diversification would be pronounced for
CEOs who earned an MBA from such schools. For the period from 1990 to 2015, we relied on finance department rankings published by Arizona State University’s W. P. Carey School of Business. For earlier periods, we used various sources (Klemkosky and Tuttle, 1977; Moore and Taylor, 1980; Heck, Cooley, and Hubbard, 1986; Borokhovich et al., 1995). These ranking systems are based on the number of articles by business school faculty and published in top finance journals such as the *Journal of Finance* (*JF*), the *Journal of Finance and Quantitative Analysis* (*JFQA*), and the *Journal of Financial Economics* (*JFE*). Based on these rankings, we identified top 50 business schools in every year since 1966. We constructed indicator variables for CEOs who received an MBA from one of the top 50 business schools in the 1970s and after the 1970s. In Online Appendix table A9, the negative effect of MBA education in or after the 1970s is observed only for those who were trained at the top 50 business schools in finance. The results, together with the “Jensen effect” above, suggest that being exposed to cutting-edge financial economics had an enduring impact on the strategic orientations of MBA graduates.

**Large acquisition deals.** Because we used all acquisition deals regardless of size, there is a possibility that our results are driven by firms that made a large number of small deals. For instance, later cohorts of MBA CEOs might have driven the results. To control for this, we include indicator variables for Large acquisition deals.

### Table 2. Event History Analysis of Diversifying Acquisition Announcements Testing the Effect of Harvard Business School Education before and after the Arrival of Michael C. Jensen

<table>
<thead>
<tr>
<th>Variable</th>
<th>Harvard MBA CEOs Only</th>
<th>MBA CEOs Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harvard MBA after 1986</td>
<td>-1.768*** (0.459)</td>
<td>-0.856*** (0.219)</td>
</tr>
<tr>
<td>Harvard MBA before 1986</td>
<td>-0.066 (0.096)</td>
<td>-0.049 (0.097)</td>
</tr>
<tr>
<td>Other MBA after 1986</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log likelihood</td>
<td>-2,716.199</td>
<td>-10,182.854</td>
</tr>
<tr>
<td>Number of firms</td>
<td>130</td>
<td>385</td>
</tr>
<tr>
<td>Number of quarterly spells</td>
<td>5,630</td>
<td>20,502</td>
</tr>
<tr>
<td>Number of announcements</td>
<td>837</td>
<td>2,968</td>
</tr>
</tbody>
</table>

* p < .05; **p < .01; ***p < .001; two-tailed t tests.

* Control variables are omitted; see Online Appendix table A8 for full results.

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11 Available at http://apps.wpcarey.asu.edu/fin-rankings/rankings/results.cfm (last retrieved on September 7, 2017).
12 To minimize differences in ranking methodology across these sources, we chose ranking systems that are largely compatible throughout the period. Klemkosky and Tuttle’s (1977) ranking is based on the number of pages published in *JF*, *JFQA*, and *JFE*. Moore and Taylor’s (1980) is based on the number of articles in *JF*, *JFQA*, and *Financial Management (FM)*. Heck, Cooley, and Hubbard (1986) used the number of articles, with fractional credit given to coauthors, in *JF*. Borokhovich et al. (1995) is based on the number of articles, with fractional credit to coauthors, in 16 finance journals including *JF*, *JFQA*, *JFE*, and *FM*. Arizona State University’s ranking used the number of articles in *JF*, *JFQA*, *JFE*, and the *Review of Financial Studies (RFE)*.
13 We did not do the same with MBA graduates before the 1970s because the earliest ranking we found started in 1966.
have abandoned diversifying acquisitions but mostly by avoiding small deals while continuing to pursue large ones, even if at a slower rate. To see if this was the case, we ran models using sizable deals only, defined as those with transaction values of more than $10 million. This procedure also drops almost half of the deals whose transaction value is not reported; however, such deals are highly likely to be smaller ones. The results presented in Online Appendix table A10 are substantively similar to our main findings, except that the effects of key explanatory variables (MBA training in or after the 1970s) are somewhat weaker than those in table 1 when interaction terms are included. Overall, the results uphold our argument that CEOs who received an MBA in the later periods were significantly less likely to engage in diversifying acquisitions than those who received it in the earlier period, even when we examine large acquisitions only.

**Event count analysis.** Lastly, we tested the robustness of our findings to using alternative statistical methods. We ran our main model, model 2 in table 1, using an event count model. We estimated a negative binomial model and analyzed annual counts of diversifying acquisition announcements. Unlike event history models, count models typically do not account for prior history of an event—for instance, the lapse of time since the last occurrence of the event. When analyzing CEOs who remain in office for a finite time (on average 8.3 years in our sample), it can be problematic to treat an acquisition that occurred one year after another equally as one that occurred after 10 years, for example. To address this issue, we included the time since the previous acquisition announcement as an exposure variable. The results of both fixed-effects and random-effects count models presented in Online Appendix table A11 are similar to the event history analysis results. CEOs’ MBA education before the 1970s has a positive effect on diversification, whereas MBA education in the 1970s or afterward has a negative effect.

**DISCUSSION**

Jeffrey R. Immelt, a Harvard Business School MBA and the former CEO of General Electric, described his MBA training as “a period of intense learning” (Bartlett and McLean, 2007: 7) and “one of the most intense times of your life” (Byrne, 2011). During his tenure as CEO of General Electric, his strategic decisions demonstrated a textbook case of agency theory: he avoided diversifying acquisitions and refocused the company on its core businesses. His strategy decisions contrasted starkly with the conglomerate model championed by his predecessor, Jack Welch, who had a doctorate degree in chemical engineering but no MBA degree. In a recent interview, Immelt (2017: 45) said, “Even before becoming CEO, I believed that the company couldn’t simultaneously be good at media, pet insurance, and making jet engines.” His case illustrates the formative influence of MBA education and the changed attitude of later cohorts of CEOs toward diversification.

Demonstrating that Immelt’s case is not unique, we examined the deinstitutionalization of diversified corporations and proposed that how the process unfolds at the firm level is contingent on top decision makers’ views about diversification. We focused on chief executive officers, who are responsible for
each firm’s strategic change. Without a significant shift in their decision-making patterns, large-scale institutional change such as de-diversification may not occur at all. Building on a historical account of the evolution of business education, we examined how business education and corporate diversification co-evolved over the last several decades. Our results show that CEOs who received an MBA before the rise of the agency-theoretic logic in business education actively engaged in corporate diversification, but CEOs who received MBA training after the transition abandoned that strategy. We also demonstrated that the degree of managerial discretion moderated the effect of the CEO’s educational background on the firm’s diversifying acquisition behavior. These findings contribute to the literature on institutional change and deinstitutionalization, as well as to the linkage between managerial cognition and corporate strategy in general and the evolution of diversification in particular.

Institutional change and deinstitutionalization are both challenging theoretical issues for institutionalists. Because of the theory’s emphasis on institutional stability and reproduction, most existing accounts have turned to exogenous shocks, such as economic crises or public policy shifts, as catalysts of change (Fligstein, 1990; Hoffman, 1999). There is little doubt that such shocks can trigger change, but they occur rather infrequently, and while they are likely to result in radical change, most cases of deinstitutionalization involve gradual and incremental changes (Campbell, 2004). For this reason, Oliver (1992) argued that more attention needs to be paid to endogenous processes of institutional change. We integrate both exogenous and endogenous approaches by examining a co-evolution of related institutional domains. We show that an event in one institutional domain can have a large ripple effect on another domain years later. Our study illustrates that financial economics’ penetration into business education in the 1970s and 1980s set the stage for the demise of diversified corporations after the 1980s. Based on this finding, we argue that in many cases, understanding an institutional change in a given domain may not be complete without understanding changes in other domains. As recent studies examining interactions among multiple institutional spheres have illustrated (Dunn and Jones, 2010; Marquis and Tilcsik, 2016), it would be beneficial for institutional analysis to move beyond the focus on a single institutional domain and adopt a higher-level perspective that can describe simultaneous changes in multiple, overlapping domains.

This study contributes to our understanding of the pace of institutional change. Institutional theory has yet to develop an explanation for why some institutional changes are abrupt while others take many years to unfold. Slow, gradual institutional changes are often interpreted as evidence supporting the theory’s main premise: institutions by definition resist change. But we propose more specific factors that determine the pace of change. First, multiple institutional domains may co-evolve, and ideas and practices may take time to transfer across the boundaries. Second, intra-organizational shifts may be necessary for actors to gain influence and initiate changes. The degree to which these two factors facilitate or impede institutional change may vary by specific empirical cases. To empirically study this proposition, it may be necessary to compare across different cases of institutional change.

Our account of institutional co-evolution also contributes to developing a theory of institutional change that incorporates the role of actor agency. We argue that institutional co-evolution requires carriers of institutional change in a double
sense: actors who bring novel ideas or practices from one domain to another and carry them out in organizations (Scott, 1995; Greenwood and Suddaby, 2006; Zietsma and Lawrence, 2010; Almandoz, 2014). Our account suggests that the pace of institutional co-evolution depends on the career progression of such actors so that they attain intra-organizational power and support. This is why it took time before the transition to agency logic in business education led to any substantial impact on firms’ diversification. As Tilcsik (2010) showed how demographic processes and intra-organizational struggles shape an organization’s response to institutional pressure over time, we emphasize the importance of within-organization career progression that affects organizational change. Our findings suggest that long-term demographic changes across generations can gradually but forcefully drive a large-scale institutional change over decades. It is worth noting that significant changes have occurred in the executive labor market since the 1990s, such as the rising popularity of external CEOs and shortened average CEO tenures (Khurana, 2002; Mizruchi, 2013). These changes could have quickened the career progression of MBA graduates after the 1970s, further facilitating de-diversification. More research on broader structural factors that determine executives’ career progression will advance our understanding of the co-evolution of business education and corporate strategy.

The historically contingent effect of business education sheds new light on the literature about the social construction of managerial cognition. Whereas it is often assumed that new generations of top decision makers have cognitive and cultural frames that differ from those of their predecessors (Ocasio and Kim, 1999; Cappelli, Hamori, and Bonet, 2014), it remains unclear where such new frames originate. Previous studies have focused on CEOs’ functional specialization as a primary determinant of managerial cognition (Fligstein, 1987; Smith and White, 1987; Ocasio and Kim, 1999), but they do not explain why different generations of CEOs with the same functional background behave differently. Business education may be a main source of intergenerational variation in managerial cognition. Paradigm shifts in business education can have an enduring impact on managerial cognition and shape how managers facing real-world business situations engage in sensemaking and act on business problems (Weick, 1995).

Our finding that the logic underlying business education affects executives’ receptivity to corporate governance mechanisms has theoretical and practical importance. In the 1980s and 1990s, corporate governance experts and shareholder activists promoted a set of governance measures, including board independence and performance pay, to constrain executives’ opportunistic behavior. Agency theorists further justified these measures by asserting that they aligned the interests of shareholders and executives (Dobbin and Jung, 2010). Despite considerable research, it can be debated whether these measures significantly change executives’ behavior (Bhagat and Black, 1999; Bebchuk and Fried, 2004). The inconsistent findings may be due to variation in executives’ susceptibility to such measures. Our findings suggest that business education and its underlying logic can be an important source of such variation. We also show that top managers’ influence on firms’ strategic decisions is contingent on corporate governance features that constrain managerial discretion (Marquis and Lee, 2013). More research in this direction may shed light on the relationship between managerial cognition and corporate governance.
Finally, the significant role of financial economics in shaping managerial cognition shown in this study contributes to the growing literature on how academic theories can construct market reality. Through its impact on managerial cognition, agency theory and its market-centered, shareholder-value-oriented worldview ceased to be only an academic theory and instead became a normative argument that prescribed how companies should be run. The theory became a self-fulfilling prophecy (Ferraro, Pfeffer, and Sutton, 2005) and transformed the world toward greater conformity to the theory, a phenomenon MacKenzie (2006) referred to as “performativity.” We suggest that business education has been a facilitating mechanism of the performativity of financial economics. Graduate education can significantly alter the worldview of a group that undergoes a similar experience during their formative years, and this can have a lasting influence over many years (Marquis and Tilcsik, 2013). Our findings are particularly pertinent to those who teach in business schools and other professional programs. Although some academics deplore management theory’s lack of impact on business practices and society (Hambrick, 1994; Pfeffer and Fong, 2002), it does seem to have an impact in the long run, albeit often in an unanticipated way. This echoes the concerns raised by Ghoshal (2005), who claimed that business schools have direct and negative influences on management practices, resulting in major corporate scandals. John Maynard Keynes, quoted by Ghoshal (2005: 75), said that “the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood. . . . Practical men, who believe themselves to be quite exempt from any intellectual influences are usually slaves of some defunct economist.” A fruitful avenue for future research would be to examine the link between education and practice in different empirical settings, such as in other professional education programs such as law (Sauder, 2008) and medicine (Dunn and Jones, 2010) and for other management practices such as diversity management (Kalev, Dobbin, and Kelly, 2006), total quality management (Westphal, Gulati, and Shortell, 1997), and business ethics and corporate social responsibility (Rutherford et al., 2012).

Our study has several limitations that future research could address. First, future studies could develop more refined measures of business education and its impact on managerial cognition. Building on previous studies (e.g., Khurana, 2007), we examined the impact of agency logic on managerial cognition using the timing of executives’ MBA degrees, but future studies may be able to construct a more direct measure using information about MBA curricula at key business schools. Second, future studies can examine the impact of business education on corporate outcomes other than diversification, such as divestiture and downsizing. Third, our sample covers only the largest U.S. firms. Future research can use a more inclusive sample and examine how the proliferation of MBA education shapes the business practices of small and medium-sized firms. Finally, future studies can extend the analysis presented in this paper to other empirical contexts, such as other countries with institutional characteristics that differ from those in the U.S. Academic disciplines, including business education, have evolved in unique ways in different countries (Fourcade, 2009). Therefore business education may shape managerial cognition differently in other contexts. Such comparative analysis will enhance the generalizability of our findings about the relationships among business education, managerial cognition, and corporate strategy.
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Supplemental Material

Supplemental material for this article can be found in the Online Appendix at http://journals.sagepub.com/doi/suppl/10.1177/0001839218768520.

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