

Anything Lost Inside the Black-Box? A Study of Learning by Teaching in Post-Merger Integration

by

Sara Ryoo

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Doctoral Committee:

Professor Gautam Ahuja, Co-Chair
Assistant Professor Seth Carnahan, Co-Chair
Professor Mark Mizruchi
Associate Professor Christopher Williams

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saryoo@umich.edu

ORCID iD: 0000-0001-9942-7044

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DEDICATION

To my parents, Kunkul Ryoo and Miyoun Kim

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Did someone say that a doctoral student's life is meant to be a rocky road? The particular experience of mine had been a roller-coaster ride. It takes enduring steps to climb up the hill for academic excellence but when you slip, you are on a spiral downhill and back on the ground before you even notice. Yet, you climb up again at a steady pace only to find yourself fall down again. That was my 7 years in academia as a doctoral student. Looking back at those years, however, I do not mind the roller-coaster ride at all because I know that I have amazing people at my side who will pull me back up and, with their help, at the end of the day I will reach the top of another hill that is just a bit higher than the one I fell from before. It was the support from numerous people to whom I owe an enormous debt of gratitude that brought me back to solid grounds and made this long journey possible. I believe that the number of pages in the acknowledgements section positively correlates with the number of years at a doctoral program and that mine is one of those outliers. Due to the limited amount of space allowed in this dissertation, I keep my words brief although my heart feels otherwise.

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ABSTRACT

This dissertation studies a unique learning by teaching opportunity in post-merger integration where the acquirer firm needs to train its existing and new employees during the integration process followed by an acquisition of a new affiliate. I first develop a conceptual framework of learning by teaching by proposing three envisioned mechanisms that relate to a distinct set of characteristics of knowledge (Chapter 2). While the learning by teaching mechanism has been relatively neglected in organizational studies, I address a research context where teaching or, in other words, training is heavily associated with integration activities, particularly in the banking industry where acquisitions is a common strategy of firm expansion. I explore how superior performance of the acquiring bank holding company facilitates a top-down management style when integrating the newly acquired bank unit and how under such conditions the acquiring bank holding company can benefit from learning by teaching (Chapter 4). I then extend my study to the process level of managerial improvement in loan risk management that results from a post-merger teaching opportunity. In particular, I adopt a delayed recognition model that analyzes how a teaching opportunity during integration leads to the improvement in timeliness and accuracy of bank managers' capability in forecasting loan default (Chapter 5). The quantitative analyses and theoretical arguments are triangulated with qualitative research that includes interviews with managers and top executives from both the acquiring and acquired banks. Taken together, this dissertation contributes to the organizational learning

and evolutionary literature by shedding light on a core theoretical construct that extends avenues for future research and provides pragmatic implications to firm managers of the learning benefits that stem from coordination and training during firm integration and from the ex-ante efforts made internally in preparation for the dynamic change.

Chapter 1

Introduction and Overview

Introduction

Firms that acquire different entities need to cope with two distinct tasks after the integration. One is securing any synergy effects that motivated the acquisition where the acquiring firm takes advantage of the enhanced facilitation in its functions through the combination of knowledge and capabilities (Montgomery and Wernerfelt, 1988; Rumelt, 1974; Zhou, 2011). The other is taking care of the potential post-acquisition disruption in routines and processes. In particular, the acquired entity suffers from a reduction in the degree of autonomy while the acquiring firm confronts interruption when the acquired entity brings new and unfamiliar knowledge and technology to the merged firm (Kaplan and Henderson, 2005; Rawley, 2010). To unfold the question on how to reach greater efficiency in coping with these two tasks, a large body of finance and strategic management research explores the effectiveness of acquisitions as well as the integration forms and conditions that would maximize post-merger performance (Ramaswamy, 1997; Kim and Finkelstein, 2009; Capron and Mitchell, 2009; Zaheer, Castaner and Souder, 2011).

Firms that acquire for the attainment of knowledge and capabilities would typically select a target firm that possess superior or complementary knowledge and capabilities relative to the acquiring firm. Firms that acquire other entities in order to expand in terms of size and market power, on the other hand, would select a target firm that would cause minimal amount of disturbance yet provides access to new markets. These target firms are

typically underperforming firms because high performers are less incentivized to sell themselves out to their rivals unless offered a high price premium. Whichever the exact motivation is to the acquisition, prior research advises us that the acquiring firm expects to learn new information on technology, market, function, or even culture held by the target firm through the merger. Under mergers where there is little to gain in terms of complementary knowledge and capabilities, however, it is yet unclear how firms survive the large grade of disturbance during the post-merger integration process and, moreover, how they generate positive returns. A typical example of such merger would be the case when firms acquire other firms to expand its business scale rather than the augmentation of its knowledge reservoir. In this dissertation, I attempt to provide potential answers to the phenomenon of interest and identify an additional learning mechanism that the acquiring firm can exploit from in the context of a highly efficiency-disrupting post-merger integration.

I build my theoretical perspectives upon the organizational literature that focuses on the development of knowledge and capabilities. Extant research has extended our understanding on organizational learning in terms of the specific mechanisms and foundational constructs. A large body of research explores how firms acquire new knowledge and capabilities over the course of accumulating experiences, which involves a repetition of trials and errors. Another stream of research focuses on a more cost efficient and risk averse approach to learning, which is learning by observing the experiences of other organizations (Starbuck, 1983; Nonaka, 1988; Argote, 1999; Levinthal and March). While the literature has advanced our comprehension regarding the search process of distant knowledge as well as its influence on strategic decisions, the mechanisms through

which an organization learns from its own knowledge and capabilities remain underdeveloped. This dissertation aspires to unravel the mechanisms through which a firm learns by reflecting upon its existing knowledge. First, I develop a theoretical concept of learning by teaching in Chapter 2. Building on the mechanisms of individual tutor learning from the education and psychology literature, I propose three core envisioned mechanisms related to learning by teaching at the organizational level, which are restoration of lost knowledge, reconfiguration of inefficient knowledge, and revamping incomplete knowledge.

Then, I describe in detail the core variables that are used in the empirically tests following Chapter 3 to help the readers' comprehension. Being fully informed of the characteristics of- and distinctions between non-performing loans, charge-offs, and loan loss provisions from the banking industry is vital to understand the empirical models in Chapter 4 and Chapter 5. The first empirical test that is described in Chapter 4 investigates the U.S. banking industry to test the impact of learning by teaching on a bank holding company's overall loan quality. Results largely support the proposed hypotheses and conclude that relatively superior bank holding companies associate more with a teaching role and learn from the teaching experience. The empirical model tests the diffusion of learning by teaching by measuring the loan quality improvement in all the parent company's affiliates but excludes the particular bank that acquired the target bank in order to tease out any potential synergy effects. In Chapter 5, I explore the learning by teaching mechanisms at a particular task-level and focus on the learning of the focal bank that was directly involved in the merger and integration. By adopting a forecasting model from the Accounting literature, I investigate the patterns of acquisitions and its impact on improving

timeliness in loan loss provisioning. Again, results are largely consistent with the theoretical arguments that relatively superior banks to the target bank become timelier in recognizing loan losses arguably due to a learning by teaching effect.

Expected Contributions

This dissertation contributes to the vast learning literature in strategic management and organization theory by providing a new theoretical construct that extends our understanding of knowledge acquisition and knowledge management. Specifically, I propose a learning by teaching mechanism where firms that involve in activities such as post-merger integration or consulting and therefore associate with extensive amount of training can develop superior knowledge and capabilities as a result of a teaching activity. Although learning by teaching is a well-known topic in other areas of social studies and has been studied largely in experiments to investigate the effect of teaching on individuals' performance (Katona, 1940; Bargh and Schul, 1980; Benware & Deci, 1984; Fiorella & Mayer, 2013; Fiorella & Mayer, 2014), little work has been done on the theoretical development and, to the best of my knowledge, this dissertation is the first to study the applications of learning by teaching at the organizational level.

The present dissertation also contributes to the acquisition literature by providing a more fine-grained integration type that considers the explorative and exploitative benefits when absorbing a new entity. In their seminal work, Haspeslagh and Jemison (1991) develop a framework of integration types that are determined by the need for interdependence to create value and the need for autonomy. The authors propose three major types of integration: absorption, preservation, and symbiosis. Unlike preservation

and symbiosis where learning comes from the acquisition of novel knowledge and capability sets, it is quite unclear to how learning occurs in an absorption type of integration. Hence, I focus on the absorption integration type where little autonomy is granted and therefore major training is involved in order to help the acquired entity to adapt to the acquiring firm's systems and routines. The degree of interdependence of knowledge and capabilities between the acquired and acquiring firm that is required to create value plays an important role in distinguishing between a two-way transfer and one-way transfer of knowledge. In Haspeslagh and Jemison's work (1991), the interdependency of knowledge and capabilities between the two merging entities bears an assumption that the direction of knowledge flow is in both directions; the acquiring firm learns from the acquired firm and vice versa. However, in many real cases of acquisitions, absorption is chosen as the form of integration although there is no interdependence of knowledge or capabilities between the merging firms such as in the case where firms acquire for scale expansion reasons. Under such circumstances, the direction of knowledge flow is highly likely a one-way capability transfer and the learning by teaching mechanism is arguably most salient when there is slack managerial capacity not being occupied by absorbing new information. This dissertation contributes to the acquisition literature by introducing a learning mechanism that triggers an exploitative type of absorptive integration.

Lastly, this dissertation provides implications to the evolutionary literature through a provision of a wider application of dynamic capabilities and absorptive capacity. Firm expansion and integration causes much change and disruption to both the focal firm's operations and the external competitive landscape. Therefore, firms that experience any type of acquisition and integration are revealed to the necessity of reconfiguring its

capability sets in order to conform to the dynamic change (Teece, Pisano, Shuen, 1997; Eisenhardt and Martin, 2000; Winter, 2003; Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, and Winter, 2009). While substantial research has explored the antecedents and significance of dynamic capabilities, findings in this area of research are limited to the firm components and conditions interconnected to the market environments and the development of the constituents of dynamic capabilities. Many prominent scholars have theorized in prior research on the discrete types of dynamic capabilities such as adaptive, absorptive, and innovative capabilities that are developed within the firm in accordance to the firm's environmental change (Teece et al, 1997; Gibson and Brikshaw, 2004; Cohen and Levinthal, 1990; Capron et al, 1992; Wang and Ahmed, 2007). However, it is yet to be fully unraveled how such different types of dynamic capabilities can interact with one another to create greater value in one's capabilities. This dissertation sheds light on the evolutionary nature of knowledge and capabilities during a special situation of post-merger integration where a teaching opportunity promotes the intertwined development of adaptive, absorptive, and dynamic capabilities that lead to capability updating and improvements in the focal firm's routine and operating processes.

Overview

The second chapter of this dissertation discusses on the theoretical components of the learning by teaching mechanism and explores the characteristics in knowledge transfer that paradoxically teaches the transferrer. In particular, I focus on the recognition of forgotten, existing, and potentially new organizational knowledge as well as its interrelatedness with the specific learning mechanisms in a teaching environment. In

Chapter three, I elaborate on the research context that pin points the opportunities to teach in the business world where firms need to invest much effort into post-merger integration in order to transfer the focal firm's existing systems and routines as well as assist improving the acquired firm's performance. Due to the favorable and unique characteristics of the financial reports in the banking industry, I use data from the U.S. commercial banking industry and focus on loan lending performance prior to and after an inter-firm acquisition in order to test the theoretical perspectives on the efficacy of learning by teaching. To facilitate understanding of the two empirical studies that follow in Chapter four and five, I provide foundational information on different types of loan risk measures that are used to construct the core variables in both empirical studies.

In Chapter four, I examine how performance difference between the acquiring firm and the acquired firm plays a critical role as a determinant to the top-down managing integration style that is often associated with an extensive amount of teaching at the acquiring firm and subsequently influence the acquiring firm's future performance. The uniqueness in this analysis lies on the fact that the acquiring firm's post-teaching performance is measured only among the affiliates that existed prior to the acquisition. Followed by testing the main effects of learning by teaching, I also theorize on the conditions to where the effect of learning by teaching can be enhanced or suppressed. I test the proposed hypotheses using a longitudinal panel data of U.S. commercial banks for the sample period between 1998 and 2009. In Chapter five, I take a different approach and measure loan lending performance in terms of risk management by adopting an analytic model that is widely used in the Accounting field in order to measure a bank's capability in forecasting loan risk. I test the effect of learning by teaching by comparing firms that

acquire new units and are forced to teach to a control group that does not involve in acquisition activities.

Finally, Chapter six summarizes the theoretical arguments and the findings from the two empirical studies as well as the implications to industry practitioners and contribution to research. I then discuss future work that can be developed from this dissertation.

Chapter 2

Conceptual Development of Learning by Teaching

Introduction

“If, in each hour, a man could learn a single fragment of some branch of knowledge, a single rule of some mechanical art, a single pleasing story or proverb (the acquisition of which would require no effort), what a vast stock of learning he might lay by. Seneca is therefore right when he says: "Life is long, if we know how to use it." It is consequently of importance that we understand the art of making the very best use of our lives.” (The great didactic, Comenius, 1649)

Over several decades, management scholars have focused on a broad stream of research where organizational learning is depicted mainly through the lenses of two mechanisms. The first type focuses on the history of a firm and the efforts that involve trial and errors during past and current performance (Argote, 1999; Posen and Chen, 2014). This type, denoted as experiential learning or learning by doing, entails improvement in a firm’s learning curve through the accumulation of decision making experiences and advancement in routines. The other type of organizational learning considers developing new routines and technology by observing other rivals in the market (Kim and Miner, 2007; Denrell, 2003). Such observational learning known as vicarious learning relies on the experience of others where one can benefit from cost and time efficiency and low risk. While prior work in this domain has yielded much influential insights on the process and outcomes of organizational learning and its impact on firm strategies, it is to my knowledge that little work has been done on departing from the core mechanisms and discovering new

constructs and processes. In this dissertation, I attempt to unveil an additional learning mechanism that is activated during the knowledge transfer process between two or more entities. To achieve a complete understanding of the full spectrum of organizational learning, I propose a theoretical construct called *reflective learning* where learning benefits are generated as a byproduct of transferring knowledge to a different entity. This can be easily understood as the process of *learning by teaching*.

In his seminal work, Huber (1991) addresses different dimensions and sources of organizational learning that typically involve the acquisition of knowledge, the distribution of knowledge, information interpretation, and memory of knowledge. Although he provides deep insight on how these major constructs provide a foundation to the architecture of knowledge and capability development, understanding how firms strengthen their current set of knowledge and capabilities and how such processes and needs are recognized within the management team remain unclear. In the effort to extend our comprehension on the growth of knowledge and capabilities and the fruitfulness of knowledge recognition, I offer an organizational behavior that initiates discovering the incompleteness and inefficiency in knowledge and capabilities within a firm. I build grounds of my arguments upon a couple theoretical antecedents as discussed in the following.

Theoretical Antecedents

Organizational Memory Loss Organizational knowledge is stored within the firm in different forms depending on the characteristic of information. Hard information, in other words codified knowledge, is written into documents, scripts, and files while soft

information is kept within routines and personnel (Levitt and March, 1988). While an extended amount of research in the organizational learning literature stems from the assumption of the retainability of cumulative knowledge, many prominent scholars have warned that knowledge embedded within an organization can, in fact, be lost when the storages of information leave the boundary of the firm either through employee turnover, losses in documents, decay in networks, or simply due to the nature of information becoming obsolete over time (Levitt and March, 1988; Argote, 1999; Burt, 2002; De Holan and Phillips, 2004). Highlighting the different perspectives towards whether knowledge acquired through learning persists or decays over time is important to understand the true reservoir of knowledge and capabilities of a firm, which ultimately leads to making superior strategic choices. The latter group of scholars who argue that an organization, in fact, forgets its existing knowledge, concern that the anticipation of future production based on the classic learning curve may turn out to be overestimated (Argote, 1999). I attempt to address such concerns in this dissertation by introducing a mechanism through which a firm can minimize this mismatch by restoring and retrieving its forgotten knowledge. Taking to account the perspective that firms can retain or rediscover lost memory will provide us with a better understanding in organizational learning and firm knowledge management. Adding to the well-developed theory of the decay of knowledge and acquisition of new knowledge, I study the renewal of knowledge, which has been understudied in the strategic management literature.

Unintentional Learning A reason to why scholars have not paid much attention to the value of recognizing one's own knowledge is because the underlying learning mechanism

is arguably less intuitive and hidden behind the more direct benefits. Huber (1991) states how learning within an organization is not necessarily conscious or intentional but could be rather unintentional and unsystematic. In conventional studies, the development of knowledge and capabilities in inter-organizational interactions are anticipated to occur to the entity with smaller knowledge stock that receives information from the more experienced. Under this perspective, the size of knowledge stock does not necessarily imply the absolute size of resource reservoir but rather a relative possession of a particular piece of information. For instance, an incumbent whose asset size is three times as larger can learn different routines or capabilities from an entrant whose characteristics and performance is distant from the incumbent. This is because the knowledge and capabilities that the entrant possesses is something that the incumbent does not own. In this regard, the entrant has a larger knowledge stock in terms of the unique information that it holds compared to the incumbent. Departing from the traditional perspective on knowledge flow, this paper focuses on the benefits that the incumbent can unintentionally exploit through the interactions with its affiliates despite their larger size of knowledge stock both in absolute and relative terms. In particular, I explore the theoretical application in the post-merger integration context where a large degree of ‘teaching’ arguably takes place. Because post-merger integration is a complex and intertwined activity of planning and coordinating between the acquirer and target, it is easy to overlook the unintentional learning and discovery benefits granted to the incumbent (March and Olsen, 1979; Levinthal and March, 1981; Huber, 1991). Later in this chapter, I will address the often obscured and less obvious learning mechanisms through which teaching can bring to the acquiring firm during an integration stage.

Double-Loop Learning In his work, Argyris (1977) develops a theoretical framework on the general types and processes of organizational learning. The conventional learning mechanisms in organizational studies fall through a single-loop learning type as firms enter the market with their initial strategy and receive feedback from other actors in the market. Depending on whether the feedback is positive or negative, firms decide to continue operating in the market with its current strategy or update its processes and strategy to receive better evaluation. In essence, single-loop learning depicts the repetition of trial and error process based on the feedback that firms receive from the real world. However, there is a critical limitation to single-loop learning as often the mental maps or assumptions of a manager at a focal firm may have errors and it is difficult to understand how managers would adjust their initial assumptions that lead to a particular firm strategy. Argyris discusses the additional loop between receiving market feedback and adjusting one's mental model that is involved in a decision-making process, which he calls double-loop learning. To help the reader's conceptual development of double-loop learning, he also suggests the conditions and inhibiting factors to this particular learning mechanism. It is argued that double-loop learning is generally encouraged by a crisis precipitated by an event or a revolution within the firm. However, even though the need for double-loop learning is recognized due to a shock, the likelihood of successful double-loop learning is low due to the rigidity in managers, social norms that prevent employees to raise challenges, and counterproductive group dynamics (Argyris, 1977). This dissertation advances the work of Argyris (1977) on the enhancers of double-loop learning and explores a possible mechanism that facilitates managers to voluntarily revisit their foundational assumptions

without confronting the aforementioned detrimental shocks that trigger double-loop learning. While double-loop learning is anticipated to stem from feedback on poor performance, I propose that teaching can promote double-loop learning for good performers even without a performance drop. To put it colloquially, a great teacher can still learn of his or her mistakes, if any, through a teaching act.

Learning by Teaching in Social Science at the Individual Level

In Social Science where individuals are the unit of analysis, the efficacy of learning by teaching has been widely investigated both theoretically and empirically. For example, tutor learning is a well-studied topic in the Education and Psychology research where a teaching activity is proven to reinforce the teacher's knowledge (Galbraith and Winterbottom, 2011; Hoogerheide, Deijkers, Loyens, Heijltkes, and van Gog, 2016; Allen & Feldman, 1973; Cohen, Kulik, & Kulik, 1982; Bargh & Schul, 1980; Roscoe & Chi, 2007; Fiorella & Mayer, 2014). Teaching is perceived as a process that is not limited to merely delivering knowledge but also as a process of developing knowledge through self-monitoring of comprehension, integration of new and old knowledge, and elaboration and construction of knowledge (Roscoe & Chi, 2007). Because effective teaching is associated with various tactics that are cognitively demanding such as explaining, questioning, assessing, and providing feedback (McArthur, Stasz, & Zmuidzinas, 1990; Shah, Evens, Michael, & Rovick, 2002; Roscoe & Chi, 2007), the entire process from preparation to explaining and to answering questions account for the cognitive development of the teacher. It is argued that the act of teaching allows the teacher to generate inferences while reflecting

upon his or her own knowledge, integrate ideas across different domains, and repair possible errors (Allen & Feldman, 1976; Bargh & Schul, 1980; Roscoe & Chi, 2007).

Bargh and Schul (1980) discuss the nature of the teacher's gain by decomposing the learning into content-specific and general learning. A teaching activity provides opportunities for the teacher to generate stronger connections and inferences related to the subject matter by organizing and elaborating the contents to be transferred. Furthermore, a teaching activity would facilitate the learning of related materials that are not necessarily part of the content being transferred. Based on this decomposition of learning effects, different teaching benefits are granted to the teacher at different stages of the teaching process. A large body of research focuses on the preparation stage of the teaching activity, which happens prior to interacting with the knowledge recipient (Katona, 1940; Benware & Deci, 1984; Fiorella & Mayer, 2013; Fiorella & Mayer, 2014). Scholars in this field argue that the amount of time the teacher is exposed to the subject matter during the preparation stage is greater to those who do not involve in any teaching activity. Studies have shown that the considerable amount of time and effort devoted to studying the teaching materials contributes to the learning of the teacher through a retrieval process of knowledge (Agarwal, Karpicke, Kang, Roediger, & McDermott, 2008; Butler & Roediger, 2007; Chan & McDermott, 2007; Kang, McDermott, & Roediger, 2007; McDaniel, Howard, & Einstein, 2009; Karpicke & Grimaldi, 2012; Koh, Lee, & Lim, 2018).

The quantitative difference in time not only implies the time teachers spend on studying the content but also the time teachers spend on organizing the cognitive structure of the knowledge they already know (Katona, 1940; Bransford, Nitsch, & Franks, 1977; Bargh & Schul, 1980). An organization of cognitive structure helps the teacher understand

the relationships between the contents rather than merely understanding the meaning of individual content (Katona, 1940). Mastery of the relationship between contents is especially important when preparing to teach as it provides a mental map that draws connections between foundational information and the subject matter to be transferred that would further facilitate the transfer of knowledge when interacting with the knowledge recipient. Content-specific learning also occurs during the explanation stage of teaching. The verbalization of knowledge stimulates long-term memory and the positive response from the knowledge recipient provides a reinforcement effect to the teacher (Rickards, 1971; Bargh & Schul, 1980). A recent study by Hoogerheide, Deijkers, Loyens, Heijltkes, and van Gog (2016) investigates the effect of verbally sharing knowledge with an audience on the teacher's learning. The authors conducted an experimental study where they offered participants an opportunity to 1) reread the teaching materials, 2) explain the teaching material in writing, and 3) explain the teaching material via video. Findings suggest that the social presence and pressure that their actions may directly affect others have enhanced the cognitive learning aspect of the teacher. While verbally explaining the teaching material, teachers constantly monitor whether the students comprehend the contents well, which is a signal to the quality of teaching. Research suggests that this monitoring process leads to greater arousal levels of the teacher that fosters cognitive processes such as memory, attention, and alertness (Arnsten, 2009; Diamond, Campbell, Park, Halonen, & Zoladz, 2007; Roozendaal, 2002; Sauro, Jorgensen, & Pedlow, 2003; Hoogerheide, Deijkers, Loyens, Heijltkes, and van Gog, 2016).

Also, elaborating contents in verbal form requires the teacher to think beyond the subject matter and subsequently helps make connections between new information and

existing knowledge of the teacher (Chi, 2000; Fiorella & Mayer, 2014). Prior studies suggest that generating quality explanations for others promote deep learning compared to a simple knowledge telling activity due to the knowledge building process described as the following (Fiorella & Mayer, 2014). Verbal representation of knowledge provides structure to tacit knowledge of the teacher. During the preparation stage of teaching, the teacher codifies knowledge into the form of manuals, blueprints, and guidelines. While the purpose of codification of knowledge is to facilitate the diffusion of knowledge to students, the time and effort put towards creating the teaching materials contributes to the knowledge building of the teacher in terms of structuring the relationships between information (Singh & Zollo, 1998). By articulating causal relationships between distinct pieces of knowledge, the teacher increases the propensity to discover new solutions and enhances his or her own cognitive growth.

Finally, distinct from the prior stages in teaching, answering to questions and responding to feedback offers the teacher to actively interact with the knowledge recipient and realize the weaker areas of the teacher's explanation (Bargh & Schul, 1980). As the teachers are required to answer to the questions and repeat the explanation, teachers are enforced to make changes to their initial way of organizing and integrating knowledge. In other cases, the questions asked are not necessarily within the capability of the teacher to answer. The different perspectives of the knowledge recipient stimulate the teacher to rebuild relationships among the contents and even discover new or different ones.

Connecting Individual and Organizational Learning: Group Level Learning

Before I discuss further in this dissertation the efficacy of learning by teaching at the organizational level, I will address in this section the theory that bridges individual learning mechanisms and organizational learning through group or team base learning. Later in this dissertation, I discuss the diffusion of learning by teaching and how the application of learning from the parent level flows to the affiliate level. In order to understand the diffusion process, it is critical to understand the isomorphism of learning from different level units such as the organization, subordinates, groups, and individuals. An organization is easily understood as a structured hierarchy of individuals and groups, which are a collective of individuals that again form the organization. Understanding the nested hierarchy of individuals to groups, and to organization will help us understand the application of individual learning mechanisms to the organizational level. Analyzing learning at the group level is especially important for the learning by teaching mechanism that is of our interest in this dissertation. Teaching involves at least two entities, the teacher and the student. In organizations, often times, the teacher is a group of individuals who are qualified and authorized to provide services to transfer knowledge to others. For example, when organizations need to train their new hires, they assign Human Resources department to take charge of transferring firm specific knowledge, routines, processes, or systems. Individuals from the Human Resources department would come together and discuss the training materials, select training methods, and share feedback from each training session. Moreover, in order to bring the new hire up to speed in terms of task specific knowledge, subject managers will work together with the Human Resources department to build new training materials and develop old materials that may be out of date. Many times, the

subject managers are the actual knowledge transferer and any learning that comes from the training program would be shared with the Human Resources department or Professional Development department for future training references.

Interactions between such multiple individuals from multiple groups facilitate and enhance the learning that is granted to the teacher group as a whole. Through this group level interaction, not only does the teacher help improve the trainee's performance and knowledge but also involves in developing the knowledge base of the teacher group. During this process, the teacher group engages in asking questions, providing feedback, reflecting, and making changes. The collective effort of individuals from the teacher group who share different capabilities and knowledge allows the team to adjust quickly to any changes (London & Sessa, 2006). Lewis (2003) explains how "the cooperative division of labor for learning, remembering, and communicating relevant team knowledge" can enhance group productivity.

Groups learn through similar mechanisms as individuals. In their work, London and Sessa (2006) provides us with the comparison of individual learning, group learning, and organizational learning and how learning at different levels resemble each other while exhibiting differences in terms of specific mechanisms. Learning across these multi-levels is analyzed based on the different individual types of learning - adaptive learning, generative learning, and transformative learning.

Adaptive learning is commonly understood as problemistic search behavior in organizational studies. Change in environmental conditions act as a trigger for systems to manage and improve their performance by adjusting inputs or processes. Individuals recognize the relationship between a stimulus and their behavior and the impact on

outcome. By adapting to this relationship, individuals solve problems, collaborate, and make decisions (Kelly, Burton, Kato, & Akamatsu, 2001; Mathew et al., 1989). Groups, on the other hand, follow the same process of adaptation but with greater efficiency and speed through the division of labor and a broader skill set. At the organizational level, adaptation occurs when groups start communicating within and across different groups and the behavioral change at the group level affects the change in strategies, rules, routines, structure, and systems of the organization. The activity of teaching triggers the group of individual teachers to adapt to new environmental changes. Materials that are used in the curriculum of teaching may not be up to date or even may be obsolete. It is to the teachers' best interest to make changes to the teaching materials and reflect the current requirements for success in order to improve the students' performance, especially when the students' performance is highly correlated with the teachers' performance. Because teachers are members of different functional groups within the organization, adaptation efforts made during the course of training reflects back to each functional group's operations and revamps the knowledge base of the organization.

Generative learning refers to the process where individuals apply new skills to their performance in order to be prepared for future demands (Laszlo, 1996). Enhanced goal accomplishment and internal mental process of insight motivate individuals to engage in generative learning. The acquisition of new knowledge at the individual level is goal-driven and self-determined in order to grow within their career path and increase performance level. Such motivations and incentives are similar for groups but differ in terms of the means to achieving generative learning. Unlike individuals, groups can hire new individuals who possess certain knowledge or capabilities or reassign roles or

responsibilities. Also, intentions to learn and improve do not have to be based on a common agreement for groups. A motivated single individual can apply his or her learning to the group's operations and educate their colleagues. At the organizational level, top managers' interest in growing the organization or preparing for unanticipated environmental change can trigger generative learning. Managers can decide to restructure the organization, change systems and culture, or even acquire new units (London & Sessa, 2006). Generative learning from a teaching activity may occur at the individual level where teachers intend to improve their teaching skills prior to teaching. This may occur due to the fact that teachers aim for better teaching evaluations or they do not want to embarrass themselves in front of the group of students. It is common knowledge that MBA students are much more challenging than undergraduates to professors in Business and the professors tend to spend more time preparing for MBA classes. In order to avoid confrontation and criticisms from students, teachers spend time revisiting their current teaching materials and methods to seek for opportunities to improve. At an organization, teaching or training is a collective effort of a group of teachers from functional groups and Human Resource departments. An individual's effort may not suffice for the goal of improving the teaching quality as a group. The motivated teacher will share his or her individual generative learnings and motivations to engage other teachers to the learning process for better performance. Again, the learning diffuses throughout the organization as the teachers bring back the newly developed knowledge into their own functional groups.

Lastly, transformative learning results in a drastic change within the focal unit's behavior and outcome (Mezirow, 1991, 1994; London & Sessa, 2006). Often through interactions with others, individuals identify the need to challenge their mental models and

assumptions and develop fresh ideas or new methods. Such transformative learning can be enhanced in groups where members of the group constantly share insights and challenge each other through feedback channels. Because of the cooperative relationship between group members, once the initial breakthrough occurs, the learning and transformation evolves more systematically than that of an individual as long as the incentives are aligned among group members. Individual and group level transformative learning may occur as a top-down enforcement in an organization. For instance, if the CEO of a firm sets new goals or visions and expects a fundamental change in operations, culture, or structure of the firm, functional departments are required to transform their current routines and systems. Similar to adaptive learning and generative learning, individuals, groups, and organizations may experience transformative learning during the course of teaching another entity. As time progresses, the preferences and characteristics of students as well as the surrounding environment change by generation. The teacher confronts the need to adjust the teaching methods or even materials in order to meet new and different demands. For example, a business professor may find herself having to take out particular case studies from the curriculum because the new generation of students became less familiar with old firms. The professor may even have to adopt new technology to facilitate learning and entirely change the method of teaching. At the organizational level, however, transformational learning occurs less often than individuals due to organizational inertia (Levitt and March, 1988; Kim, Dobrev, and Solari, 2003; Dobrev, Kim, and Carroll, 2003). As organizations accrue experience in a particular type of form, they become less likely to change in future transformations (Dobrev, Kim, and Carroll, 2003). Managers are favorable to current routines rather than having disruption unless there is pressure from a strong force or a shock

that underlines the need for change. Although not on a day-to-day basis, organizations are yet exposed to such shocks such as mergers and acquisitions, expansion, or change in management. In the later section of this dissertation, I discuss how training the acquired firm's employees can trigger transformative learning at the acquiring firm.

Nowadays, the diffusion of learning has become much more efficient through the advent of communication technologies that enable individuals and organizations to share information more frequently and faster despite any geographical distance between the entities (London & Sessa, 2006). Learning benefits harvested at a single unit level can now travel more efficiently and effectively across multi-levels. Organizational learning by teaching can occur as individual teachers transfer learning to one another and bring back the improved contents to their original functional group. These functional groups share information and enhance operations that affect a higher level institutionalization of strategy, structure, culture, and systems of the organization and improve the performance of the organization as a whole (London & Sessa, 2006).

With a better understanding of how individual learning evolves into organizational learning, I apply the theoretical perspectives of individual learning by teaching to organizations by linking the learning by teaching mechanisms to organizational knowledge pathology in the following sections.

Envisioned Mechanisms at the Organizational Level

Revisiting Knowledge As addressed at the beginning of this chapter, the stock of organizational knowledge is not necessarily cumulative as it can be lost due to various causes that include employee turnover, document losses, decay in networks, or technology becoming obsolete (Levitt and March, 1988; Argote, 1999; Burt, 2002; De Holan and Phillips, 2004). As much as this trait of knowledge negatively affects the full development of a firm's knowledge and capability, it also provides, paradoxically, areas to learn and improve through the recovery of lost information.

In the organizational context, training programs require a great deal of preparation in terms of time, money, and effort prior to transferring any knowledge or capabilities. During the preparation stage of a training program, the teaching entity may need to collect information that provides a backdrop or foundational knowledge of the context to be transferred in order to facilitate the knowledge receiving entity's understanding on the material being taught. Providing foundational knowledge may require the teaching entity to *revisit* its current set of knowledge and capabilities. Similar to the teaching preparation processes at the individual level, organizations are encouraged to integrate current knowledge with prior knowledge and thoughtfully lay out the relationships between discrete fragments of knowledge when creating backdrop materials in a training program. In the course of clarifying relationships between knowledge, firms may realize that a potentially valuable part of knowledge had been lost from their database or neglected over time. Once the recognition of lost knowledge takes place, managers of a firm are assumed to act at their best to restore the missing parts given that the lost knowledge is considered valuable. Unlike newly acquired knowledge, restored knowledge lasts over a longer period

due to the additional accumulation of effort and additional time being exposed to the knowledge being recovered (Katona, 1940; Bransford, Nitsch, & Franks, 1977; Bargh & Schul, 1980). Also, the focal firm's absorptive capabilities that have been developed over time are highly likely to be superior than those of the focal firm in its past. Greater absorptive capabilities allow the focal firm to recover lost knowledge more efficiently than what it would take if it were the first time to acquire the particular knowledge (Cohen and Levinthal, 1990). Because the existence of prior knowledge provides building blocks to the subsequent development of absorptive capabilities, the restoration of prior knowledge arguably offers the firm of a broader set of knowledge and capabilities that can further improve the firm's absorptive capabilities in subsequent periods.

Inherent in training programs are stages of tasks, of which firm managers can clearly identify such as planning milestones, preparing materials, modifying contents, and transmitting knowledge, while others may be less intuitive resulting in failure of recognizing the value of such tasks. The recognition of memory loss falls in this category of relatively less intuitive tasks while it is, in fact, embedded in various practices of the firm. Possible circumstances where lost memory can be recognized include 1) crisis events where negative performance feedback or problematic systems induce the need for revision of current routines or 2) training programs derived for the purpose of transferring knowledge to another entity. This dissertation focuses on the latter.

Reconfiguring Knowledge Procedures and knowledge become obsolete or old fashioned over time. Some managers acknowledge this issue and update their processes and measures while others may choose to preserve the inferiority. This widely known

managerial rigidity, denoted as the competency trap (Levitt and March, 1988), describes the phenomenon where managers continue to pursue certain routines that are not necessarily the optimal choice because the recent and frequent usage makes them favorable (Levitt and March, 1988; Cohen and Levinthal, 1990). The tendency and momentum of using inefficient procedures can be discontinued when managers are provided with motivations or incentives to make corrections. This dissertation discusses the motivations to modify inefficiencies in the perspective of firm managers who lead a post-merger integration and are responsible for the preparation and execution of knowledge transfer.

If there are any incorrect or outdated information or any inefficiency in the process of transmitting knowledge, managers at the acquiring firm would likely notice the error in the preparation stage prior to communicating the focal knowledge with the acquired firm. Because of the possibility of employees at the acquired firm recognizing the error or inefficiency, managers at the acquiring firm are now endowed with incentive to preempt the detection by modifying any imperfections a priori. Such preemptive strikes involve a re-examination of the current capability set and an adjustment of procedures to resolve for any systematic rigidity.

In addition to making corrections, acquiring firms are often required to codify existing procedures, measurements, and rules into documents to transfer the knowledge to the acquired entity in post-merger integration. For instance, because tacit knowledge is stored in intangible forms or because knowledge may be complex and intertwined, accurate comprehension on the focal context may be difficult for the knowledge recipient. While the managers of the acquiring firm are motivated to effectively complete the knowledge transfer, they are incentivized to transform the focal knowledge to its greatest efficiency

and simplicity to make it easier for the recipient to understand. Empowered with the motivation and incentive to evaluate and revise current practices and mental models, managers are likely to recognize inefficiencies and *reconfigure* existing procedures and even create more superior and efficient ones.

Revamping Knowledge During an integration process, managers at the acquiring firm need sufficient comprehension of the position and status of the acquired entity within the competitive landscape and the requirements that apply to the acquired entity by the current market environments. This thorough understanding designs the development path of firms and steers management to i) strategically select which knowledge and capabilities should be transferred, ii) effectively execute the knowledge transfer in a customized manner to the specific relationship between the acquiring firm and acquired firm, and iii) improve the integrated firm's performance if necessary. The frequent and in-depth interactions between the acquiring firm and the acquired firm involves a great extent of coordination and reciprocal feedback that allows the acquiring firm to collect a vast amount of information, which is necessary for a successful integration and subsequently generating positive returns. Not only do managers acquire firm specific information, but through thorough due diligence and intense collaboration, managers also encounter market related information such as conditions that are required by the competitive market that applies specifically to the acquired firm who may have different organizational characteristics compared to the acquiring firm.

In firm acquisitions, it is crucial for the acquiring firm to understand the development trajectory of the acquired firm regardless of whether the acquired firm is at

its full maturity or at its infancy. Constant feedback loops and coordination between the acquiring and acquired firm naturally offers the acquiring firm with a better idea of the competitive landscape. As the acquiring firm needs to thoughtfully lay out guidance in order to encourage successful performance for the integrated firm, such motivations stimulate an expansion of knowledge search for the acquiring firm. With no initial purpose of gathering knowledge about the market environment at the point of acquisition, the acquiring firm unintentionally learns about the challenges that the acquired firm faces through frequent feedback loops and communication during the training process.

Now that the integrated two entities together have more resources and capabilities, collaboration between the two units can enable finding solutions to challenges that either firm is facing at a greater efficiency. What is interesting is that the cultivation of a better understanding of the full spectrum of current market requirements, from those that the acquiring firm faces to those that the acquired firm faces, becomes useful for the acquiring firm to resolve issues that itself confronts in future operations.

Recognition and development of the missing knowledge pieces within the acquiring firm is arguably facilitated through training programs and *revamping* knowledge and capabilities is especially useful when a firm is embedded in a dynamic environment (Eisenhardt and Martin, 2000). Figure 1 summarizes the three pathology of knowledge and the related mechanisms of learning by teaching that associates with each characteristic.

Learning by Doing vs Learning by Teaching

From the restoration of the parent firm's lost memory to reconfiguring existing practices and to revamping the parent firm's knowledge base, this dissertation suggests potential learning benefits that may be offered to the acquiring firm through extensive preparation and consistent interactions with its newly acquired affiliates. It yet remains unclear how the learning by teaching process distinctly distinguishes itself from the traditional learning by doing mechanism.

Research on learning by doing builds upon the premise of the acquisition of knowledge related to improving a focal activity. To gain knowledge of a particular task, a firm needs direct or indirect experience on the focal task and accumulate related knowledge and capabilities (Singh and Zollo, 1998). The assumption behind the traditional learning by doing mechanism is that knowledge, over time, is permanently stored within the firm boundaries and managers make rational decisions based on existing knowledge. In reality, however, knowledge not necessarily stays within the firm and rationally bounded managers may not have a thorough and precise understanding of gaps and errors in their current knowledge set. In this dissertation, I propose how learning by teaching, as a distinct mechanism, plays a role of a supplemental process that solves for such issues.

To help understanding the core differences in learning by teaching versus learning by doing, I decompose learning into two components: content and action. Prior research on learning by doing has interchangeably used these two discrete components to describe the underlying forces and goals of organizational learning. While learning by teaching shares some basic characteristics with the learning by doing mechanisms, which includes reconfiguration of resources and expansion of search opportunities, unlike learning by

doing where the accumulation of action provides development of knowledge related to the focal action, the suggested framework of learning by teaching focuses on the contents of knowledge that are distant to but derived as a byproduct of the focal action, which is teaching. I attempt to disentangle the two mechanisms by its unique characteristics addressed below.

First, the *initial driver* of the two learning mechanisms differ as the traditional learning by doing is a goal driven process whereas learning by teaching is unintentional byproduct learning. From the perspective of the traditional learning by doing approach, the benefits that the actor seeks for relates to the improved efficiency in the focal act, in which our case is teaching. Scholars who adopt this viewpoint would expect the hours of preparation to decrease or the use of teaching methods advance as the teacher accumulates experience. From the perspective of learning by teaching, however, the actor's learning comes from the content development and change in future behaviors related to the knowledge being transferred not the actual act of transferring knowledge. In other words, the learning outcomes between the two mechanisms differ where learning by doing provides novel inferences related to the focal act while learning by teaching provides new connections and structure to the content being transferred rather than improvement in the focal act. When assessing learning from a teaching act, the learning by doing framework would focus on the improvement in teaching skills rather than the actions that are being taught. Hence, I conclude that the upfront awareness of the learning benefits from learning by doing is high and the benefits are action driven improvements while the awareness of learning from the mechanism of learning by teaching is low and the benefits are rather content driven.

Second, the two mechanisms differ in terms of *the nature of the learning process*. The acquisition of new knowledge in learning by doing is considered as an unconscious act of picking up tacit knowledge as one performs a focal activity. Learning by teaching, on the other hand, focuses on deliberately restructuring and organizing existing thoughts. I do not argue that learning by teaching does not entail unconscious learning as not everything is planned ahead when one engages in a teaching activity nor vice versa. The core learning benefits from teaching, however, are derived from codifying knowledge and organizing one's comprehension on the focal knowledge to be transferred. Therefore, I argue that the degree of consciousness in the process of learning is greater in learning by teaching than learning by doing.

Lastly, I distinguish the two learning types by the individual mechanisms of learning. Learning by doing focuses on acquiring fresh perspectives and efficient approaches related to increasing the performance of the focal task. Learning by teaching, on the other hand, provides knowledge on the overall health status of the focal actor's existing knowledge base. Teaching in a corporate context triggers an opportunity to examine the current knowledge and capabilities of the firm by recognizing the need to recover lost knowledge, diagnosing errors or inefficiencies in current knowledge, or identifying gaps between fragments of current knowledge. In essence, learning by teaching focuses on the evolution in modules and development in recognizing one's own knowledge through revisiting, reconfiguring, and revamping knowledge during the course of effectively transferring knowledge to another entity. Table 1 provides summary of the distinctions between learning by doing and learning by teaching.

Learning by teaching finds its uniqueness in terms of two different processes. First, learning by teaching engages in a psychological process where the teacher feels pressure and urgency to 'learn' what he or she already knows in order to make it readily transferrable to the student. Because there is social pressure towards the teacher that he or she should understand the content being taught better than the student, the teacher is motivated to revisit his or her current knowledge base and thoroughly understand the content. There is also an urgency of learning. It is logical for the teacher to transfer up-to-date knowledge on superior methods that would lead to the improved performance rather than old fashioned inefficient processes. Therefore, the teacher would upgrade his or her knowledge to meet the most superior and up-to-date standards prior to teaching. There is, however, an initial hurdle of overcoming the foreignness of new knowledge when the teacher intends to upgrade their knowledge. In the organizational studies, this tendency of sticking with old processes is referred to as competency traps. The urgency to teach enforces the teacher to learn and overcome these competency traps. Let's take the example of using an excel program on the computer when managing data. Although one may be aware of the existence of running a macro function, because it takes time and effort to learn the new method, one may stick with manually adjusting and entering data. When the person is demanded to teach how to use excel and manage data, however, one would not suggest the inefficient way but rather learn how to use macro and transfer to the student the superior method instead.

Second, learning by teaching finds its novelty in the fact that teaching involves an interactive process between two or more entities. The interaction with students while transferring knowledge exposes the teacher to new directions of thought processes as well

as unrecognized gaps in the teacher's knowledge base. This interactive process contributes to the enhancement in the teacher's knowledge and changes the behavior of the teacher as much as it impacts the behavior of the students.

In the next chapters, to test my theoretical arguments, I use an extensive panel data set from the U.S. banking industry and exploit a unique event, namely the 2007 - 2009 financial crisis, as it provides a natural setting where the Basel Accord promotes a superior provisioning method, which firms with experience in a teaching opportunity would have arguably adopted prior to the financial crisis through learning by teaching. The third chapter leads the two empirical studies by providing foundational information on the research context.

Chapter 3

Research Context – The U.S. Commercial Banking Industry

Teaching in Business

In firm acquisitions, integration processes require an extensive amount of planning, preparation, explaining, and coordination to fully support the newly acquired unit to adjust to and follow the rules, systems, and routines of the acquirer. The acquiring firm conducts a due diligence on the prospective target firm prior to the acquisition, and once the acquisition decision is made the firm forms a special team of managers to prepare and execute the integration. The following comment from an interview with a bank manager at an acquiring firm after an acquisition describes the integration process and its general timeline.

“...teams are assigned for the integration process and manuals are created. They (the firm) make changes each time (an acquisition occurs). It was a three-months intense training program and subject experts, including myself, were assigned to coordinate with the new guys to get things done. Although it was a three months training program it usually takes at least 18 months to truly get the system embedded... We definitely look back into the materials from the past and we definitely learn from ourselves...”

In general, acquiring firms create more or less than 50 new programs for the purpose of training newly acquired units. For example, the 2009 Corporate Responsibility Report of TD Bank who acquired Commerce Bancorp in 2008 reveals as follows the extent of financial and physical efforts invested into a single integration process.

- A set of Guiding Principles and Integration Objectives guided our governance and decision making throughout the entire process.
- Human Resources (HR) teams worked to ensure that employees were supported through the transition and kept informed of HR initiatives impacting them.
- During the 18-month period of integration we:
 - integrated our brand, culture and business model at 1,100 stores, and successfully completed data conversion;
 - trained 15,035 employees;
 - logged a total of 385,000 hours of training; and
 - developed 88 new training programs to support integration.

Although teaching does not immediately sound like a viable activity in the business context, in fact, teaching is one of the activities that the firm heavily invests up to \$100 billion a year (Bersin & Associates, figure for global spending, 2008), especially when training during, although not limited to, post-merger integrations.

In an article from McKinsey & Company's quarterly publication in 2010, Smet, Mcgurk, and Schwartz (2010) describes the stages and general processes of a firm's training program. Prior to the actual training, the firm needs to ensure that they have the right personnel, which include relevant subject leaders and HR staff, on board for the

program to be successful. Here is an example directly quoted from the McKinsey Quarterly (2010) that describes this process:

“..One industrial company noted a need to upgrade the skills of its marketing department. The HR staff launched a well-conceived program—based on a clear definition of the new skills good marketers must have—that included a curriculum developed by a leading university. In parallel, the *company hired several employees who had the skills it was trying to foster and who would, presumably, help their colleagues develop them.*”

The authors discuss how the engagement level of subject leaders impacts the overall effectiveness of firm training. Companies realize greater improvements in operations when relevant leaders participate in designing, delivering, and reflecting from the training materials. Reflecting upon the leaders’ own mindset and bringing the learning back to their daily operating environment after the training has been completed has been identified as the core instrument of training (Smet, Mcgurk, & Schwartz, 2010). Yet, many firms do not acknowledge the benefits that stem from the leaders’ reflective learning and many training programs fail when leaders overlook the importance of reflecting upon current knowledge and reconfiguring processes that leads to improvement in firm performance.

The next step in teaching is delivering the focal knowledge. Depending on the context and purpose of training, either HR staff or subject leaders engage in the actual teaching activity. In many firms, the impact of teaching is generally measured over the delivering act. In other words, participants or students provide feedback based on merely the delivery process of knowledge on whether they liked the program or not (Smet, Mcgurk, & Schwartz, 2010). This

implies that there is a probability that incentives for HR departments or subject leaders are not aligned with the organization's goal to ultimately improve performance. This paper, therefore, provides practitioners implications that consciously looking after reflective learning may lead to greater improvements in operations and performance by revisiting current processes, standards, and systems and making adjustments to any inferior routines or reducing inefficiencies.

The last step implied in the McKinsey Quarterly (2010) is the bringing-back-knowledge stage. Prior to and during the knowledge delivery, leaders from functional areas get together with the HR department to create and develop training materials. As the environment of which the firm is part of dynamically changes over time, companies face the need to update capabilities. To fulfill this need, firms adopt and transfer new or advanced skills to their employees. Functional or area leaders are presumed to have insight over unforeseen fluctuations or transformations in the industry or macro-environment. These leaders bring their expertise to the table when preparing for a training session. During this process, leaders and HR managers jointly or independently discover areas for improvement in the knowledge to be taught. Based on the expertise of these individuals who participate in the preparation stage of training, not only do these functional leaders make corrections to outdated or inefficient information but also look out for means to further develop the knowledge of interest. This particular thought process of the functional leaders is where reflective learning takes place. As in Argyris' (1977) work on double-loop learning, managers adjust their mental representations and assumptions to current models that lead to the development of further knowledge. Once reflective learning is realized within the group of teachers at the training program, it is natural for these teachers to return

to their original functional groups with new knowledge that has been developed over the course of training and transfer the advanced information to other members of the group unless there are other incentives to behave otherwise.

In the two empirical studies that follow this chapter, I study the effect of teaching on improvements in loan risk management. In order to help the understanding of the readers of the empirical studies in Chapter 4 and 5, I explain a couple measures widely used in the banking industry.

Banking industry and financial statements

Federal law enforces all commercial banks including both private and public institutions to file their financial information to the Federal Reserve and FDIC on a quarterly basis. This report, called the Y-9C or Call Report, discloses the bank's financial conditions, risk profiles, and detailed breakdowns on income allowing for internal and external parties to monitor the institution's performance and stability. Requirements to the call report differ by size of the bank, nature of activities, or the possession of foreign affiliations (FDIC, 2016). The vast amount of information, standardized requirements, and enforced reporting system allow researchers to use call reports as a major source of readily available statistical data.

Each institution that is insured by the FDIC is assigned a unique *certificate number*, which is used as a bank identifier in call reports. Another useful bank identifier in public financial reports is the *rssdid* that is assigned by the Federal Reserve. With these two identifiers, researchers can integrate different sets of financial reports and match information for a broader approach in research. The main variables used in this dissertation

are collected from three different financial statements of commercial banks. Spanning the information provided in the FDIC call reports, I combine loan portfolio breakdowns from the institution's balance sheet where loans are typically specified into four categories; real estate loans, commercial and industrial loans, individual loans, and agricultural loans. Finally, I merge the income statement data to collect accounting measures to loan risks. The importance of loan data and the advantage of the extended data set will be further addressed in the following sub sections.

Accounting measures of loan risk

Loan income comprises the biggest component in bank assets, hence, considered the most important and fundamental economic activity of a bank. Because default in loans directly affect the stock value of a bank, troublesome loans are of particular interest to investors, stakeholders, and financial analysts. Also, due to the fact that loan lending activities involve higher level oversight and estimates of bank managers, it is crucial in the banking industry to develop accounting tools that enable internal and external parties to monitor and manage default risk by providing direct and indirect measures to loan losses. In this section, I address three distinct accounting measures that capture default risk associated to loans where some measures are based on realized values and others depend on forecasted numbers.

Non-performing loans When the bank does not receive either interest or principal payment for more than 90 days on a particular loan, the loan of concern is booked as a non-performing loan. Non-performing loans are categorized into non-accrual loans, past-due loans, or troubled debt restructuring (TDR). Non-accrual loans are loans that do not

generate interest of which was agreed to be paid upon the conditions when lending to the borrower. Once the loan starts not to accrue interests, it is categorized as a non-accrual loan regardless of the post-90-day due from the scheduled payment. On the other hand, past-due loans are generated when a loan payment has not been made as of the 90th day past its due date. Past-due loans can still generate interests, which make past-due loans distinct from non-accrual loans. Once the loan is marked as non-accrual or past-due, the bank now becomes incentivized to ease the terms of contract to at least partially collect the promised payments of principle and interest. Therefore, the bank creates a troubled debt restructure that may lower or erase interest payments or even remove part of the debt on the principle itself. Any negative difference between the renegotiated amount of future cashflow and the outstanding principal amount from initial contract is accounted for in the loan loss provisions (Wahlen, 1994). Unless the bank specified a collateral in the initial contract to cover for the losses in case of a non-payment, non-accrual loans and past due loans are highly likely to end up as a loss to the bank. From a managerial standpoint, non-performing loans are realized values of expected loss and there is little room for any managerial discretion in constructing such measures. Once the bank identifies expected loan losses, they make changes to their allowance that was sets aside as a reserve. Managers can deploy more discretion and control over allowances and provisions in terms of calculation and book keeping.

Loan loss provision In order to understand the loan loss provisions, one must understand the concept of loan loss reserves, commonly known as allowance for loan loss leases (ALLL). To put it simple, loan loss reserves is a balance sheet contra to accounts receivables. Banks are required by the federal banking regulators (Federal Deposit

Insurance Corporation, Office of the Comptroller of the Currency, and Federal Reserve) to set aside an expense as a buffer for their future loan losses (Walter, 1991). Generally, the amount set aside as reserve is around 2% - 2.5% of the outstanding accounts receivables. Loan loss provision is a forecasting measure that calculates the change in loan loss allowances. According to the AICPA Guide Audits of Banks (1983), the essence of loan loss provisions is to adjust the loan loss reserves in order to reflect the expected loan losses (Ahmed, Takeda, & Thomas, 1998). Loan loss reserves are increased and income is decreased once the loan losses provisions are updated reflecting actual foreseeable loan losses (Wahlen, 1994). The main determinants of loan loss provisions can be narrowed down to loan risk, loan portfolio, and loan income.

$$LLP = f(Risk, Portfolio, Income)$$

Loan risk is a function of the ability of the borrower in making repayments, collateral, and the terms of contract upon lending. Such risk may differ depending on the type of loan. Typically, loans are categorized into agricultural loans, real estate loans, commercial loans, and individual loans. Some banks are heavily weighted towards lending real estate loans while others focus on commercial loans. Loan loss provisions have its significance in regards to being a core component of what constitutes a bank's return on assets.

$$ROA = \frac{(II - IE)}{Assets} - \frac{(NonIE - NonII)}{Assets} - \frac{LLP}{Assets} + \frac{G/L}{Assets} - \frac{Tax}{Assets}$$

Later in the empirical analysis, I use loan loss provisions to measure a bank's loan quality as loan loss provisions or non-performing loans over total assets represent the quality of a bank's loan lending quality. Unlike non-performing loans, loan loss provisions reflect a great deal of manager discretion over the timing of provisions (Wahlen, 1994). I

will take advantage of this trait of loan loss provisions to test the post-merger improvement in accuracy and timeliness in loan loss forecasting later in Chapter 5.

Chargeoffs Chargeoffs are realized losses due to loan default when a consumer becomes delinquent on a debt. Therefore, the outstanding balance of this uncollectible loan is deducted from the loan loss reserve. Although a chargeoff is generally considered as a non-discretionary measure, the timing of report may involve managers' discretion. The only non-discretionary measure among the loan risk measures would be non-performing loans as there is a strict regulation of 90 days non-payment that determines whether a loan is performing or not. The Federal Financial Institutions Examination Council (FFIEC) guidelines advise banks to report chargeoffs after 180 days of delinquency or 60 days after receiving notification of bankruptcy from the court (<http://www.federalreserve.gov/releases/chargeoff/>). Although there are cases where federal bank regulators may involve in declaring certain loan chargeoffs, chargeoffs are generally decided by the individual bank (Wahlen, 1994).

Efforts to Improve Loan Risk

Because loan losses comprise a significant portion in calculating the bank's financial performance, bank managers strive to improve loan risk. There are various means to achieve greater loan quality where, typically, managers would renegotiate the terms of lending, seek another entity that would take out the troublesome loan, or update their monitoring system to identify troublesome loans at the earliest possible.

When the bank detects possible default in loan payments or when loans are categorized as non-performing loans, the bank renegotiates the terms of the initial contract

in order to collect partial or full amount of the principle. The terms that are negotiated include interest rates, payment due dates, or even the amount of principle itself. Another method to improve loan quality includes banks engaging in financial transactions to sell the troubled loan to a different entity, which is called factoring in financial terms. For example, Xenith Bank started working with factoring companies in order to improve loan quality of their new unit that was acquired due to expansion aspirations. While Xenith bank considers the operations and cashflows of their clients who are mostly small and middle size business owners, the factoring company they took in were only interested in the strength of the clients of those business owners. Due to the difference in evaluating the strength of clients, loans that were considered as troublesome loans to Xenith were not too much of a concern to the factoring company and the factoring company took out a large portion of loans that Xenith was bothered with. Lastly, banks would invest in their monitoring technology or update any risk forecasting systems or policies to better detect loan defaults or better prepare for loan defaults. In an interview with the CTO of a large U.S. based bank, information management is considered one of the major ways to improve loan risk. Timely, comprehensive, and accurate information is crucial in detecting and determining delinquency in loan payments. Banks make continuous effort in validation and remediation of inaccuracy and such efforts are often augmented by certain exogenous events such as inter-firm mergers.

Using data collected in the U.S. commercial banking industry, the following two chapters study the feasibility of the aforementioned theoretical perspectives on the efficacy of learning by teaching in the organizational context.

Chapter 4

Empirical Study Testing Learning by Teaching in Bank Loan Quality Selection

Introduction

“The process of teaching ...gives a deeper insight into the subject taught” Comenius, 17th-Century Philosopher, Father of Modern Education (Wagner, 1982)

“The whole art of teaching is only the art of awakening the natural curiosity of young minds for the purpose of satisfying it afterwards.” (Anatole France)

Scholars in organizational studies have often focused on two major learning mechanisms: experiential learning and vicarious learning. This study tests the efficacy of an additional learning by teaching mechanism that has been neglected in the management literature. In this study, I attempt to identify the learning benefits of mergers, which are distinct from synergy effects, that acquiring firms may exploit during their interactions with their newly acquired affiliates. I argue that an integration process provides the acquiring firm with an opportunity to teach the acquired firm in a training program the acquiring firm’s systems and routines, which subsequently triggers an opportunity for the acquiring firm to re-evaluate and reinforce its current knowledge and capabilities. While traditional studies in organizational learning build upon the premise of acquisition of new knowledge related to improving a focal activity, this paper adopts a different angle by proposing the possibility of firms learning from their own knowledge and capabilities and improving without the pre-requisite of acquiring new knowledge. Using data from the U.S. commercial banking industry from 1998 to 2009, I examine a *learning by teaching* effect associated with bank holding companies who acquire new banks and the conditions that

facilitate the efficacy of the proposed mechanism. In the empirical analysis, I find evidence that subsequent to an acquisition, there is improvement in loan quality of the acquiring firm's pre-existing affiliates especially when the acquiring firm and the acquired firm share similar capabilities. This paper finds its novelty in exploring and developing a new construct of learning by teaching and its pragmatic implication for managers who are involved in post-merger integration.

Theory and Hypotheses

Inter-firm acquisitions are considered a complex activity and the degree of complexity is determined by the goals of acquisition, whether the acquisition took place in order to learn unique and superior skills of the target entity or whether the acquiring firm intends to expand its market coverage without investing in establishing additional affiliates, or the perspective of integration, deciding on the degree of integration or autonomy along a continuous spectrum. The reason that theory on acquisitions are difficult to reach consensus is because every acquisition differs by multiple dimensions in each case and firms need to create different processes and rules on how fast to move, how carefully to implement, and who takes responsibility in major roles, etc. (Haspeslagh & Jemison, 1991). Although the underlying reasons and conditions behind a merger decision is yet to be articulated, some acquisitions are surprisingly simple in terms of their straightforward goals and forms decided by top management of the acquiring firms. Clear expectations of firm executives on the value creation via acquisitions often entail effective and fast execution of the integration process. Based on multiple interviews with bank managers who have extensive experience in acquisition decision making and implementation, many

integration processes end up in a top-down management style where the acquiring firm transfers its routines, systems, and culture to the acquired firm. The likelihood of top-down management is expected to be greater for firms who aim to expand geographically and acquire low performers instead of establishing a new unit from scratch. Arguably, better performing firms are likely to believe in the superiority of their own knowledge and capabilities and therefore are likely to engage more in transferring knowledge in areas where they are already performing well. Otherwise, if the acquired firm is superior in terms of skills and performance, the acquiring firm would want to learn and absorb new and better capabilities rather than enforcing their own inferior ones to the acquired firm. Therefore, I argue that vertical knowledge transfer (top-down management) would most likely occur when the acquiring firm is superior in terms of performance to the acquired firm and the spare managerial capacity allows the acquiring firm to identify and learn from training benefits during the interaction and coordination processes of integrations.

Hereby I argue:

Hypothesis 1: The greater the parent's performance superiority to the target at the time of merger the better the loan performance of the parent's affiliates following the acquisition

Firms not only aim to acquire superior skills from different entities but also aspire to learn different skills or complementary knowledge from inter-firm interactions. One of the most apparent ways to obtain this goal is to acquire a different organization that possesses such knowledge or capabilities of interest. Regardless of how great the acquiring firm's performance, if the firm's goal of acquisition is to purchase the different skill sets,

the acquiring firm will learn from the acquired unit. Therefore, it is argued that mergers between distant firms in terms of capabilities will entail knowledge transfer from both directions. Although a decent degree of training still takes place in cases where the acquiring firm intends to learn from the acquired firm, due to limited managerial capacity, the learning effects that can be obtained through teaching would be of second priority and would not be salient when the managers' mental capacities are occupied by earning more obvious gains. I argue that managers would prioritize acquiring new and novel knowledge over reconfiguring, restoration, and revamping current and old knowledge. Hence, when the acquired entity possesses greater degree of distant or complementary knowledge, managers would spend any spare managerial capabilities in acquiring new knowledge leaving less mental capacity to engage in improvements that are triggered by a teaching process.

Hypothesis 2: Higher proximity in activity domains between parent and target increases the positive relationship between the parent's performance superiority to the target at the time of merger and the loan performance of the parent's affiliates

The efficiency of knowledge transfer relies partially on the cultural similarities between the transferring and receiving entity (Bhagat, Keida, Harveston, and Triandis, 2002). Related task experience increases proficiency in capability sets (Littlepage, Robison and Reddington, 1997) and subsequently improves learning to a greater extent (Schilling, Vidal, Ployhart, and Marangoni, 2003). Teams that are involved in related tasks share similar background in knowledge and therefore recognition and utilization of

expertise is facilitated when such entities work together (Littlepage, Robison, and Reddington, 1997). When learning occurs to one entity, other entities that share similar structure, institutional mechanisms, or culture can more frequently and speedily recognize the created value and adopt the new knowledge to current processes of their own. A large body of research on related diversification discusses the advantages that firms can reap from similar capabilities in knowledge transfer (Singh & Montgomery, 1987; Salter and Weinhold, 1979; Markides & Williamson, 1994). Entities that share common distribution systems can create a new strategic asset at a faster pace or at a lower cost and in turn improve the quality in existing assets (Markides & Williamson, 1994). Similar to the value created through economies of scale and scope in related diversifications, the learnings from a teaching process can diffuse to the acquiring firm's other affiliates and generate value via the same mechanism. When affiliates of a parent firm who recently acquired and learned from the interactions with the newly acquired unit, the improved skills can equally apply and distribute to other affiliates if the affiliates share similar operational activities. The parent firm can exploit the interrelationships among its different affiliates and conduct a faster and more efficient knowledge transfer while at the same time applying what has been learnt to different contexts and achieving economies of scale and scope (Markides & Williamson, 1994). Hereby, I argue that the diffusion of learning by teaching is facilitated when there is greater homogeneity within parent's affiliates.

Hypothesis 3: Greater homogeneity in the parent's affiliates increases the positive relationship between the parent's performance superiority to the target at the time of merger and the loan performance of the parent's affiliates

While learning by teaching may share similar traits with the conventional learning by doing mechanism, there are aspects that are unique to the learning by teaching mechanism. Unlike the traditional learning where frequent and intense accumulation of a focal activity contributes to recognizing avenues of improvement and creating greater value from the activity of interest, learning by teaching needs gaps between the first teaching opportunity and its subsequent teaching opportunity. Frequent acquisitions reduce contents to learning from revisiting, recombining, or revamping knowledge. Similar to time compression diseconomies where it takes time to accumulate resource and knowledge, once an adjustment has been made in the errors within a firm's current procedures, it takes time to accumulate "enough errors" for the next teaching opportunity to contribute to discovering and improving any additional inefficiency. Therefore, learning by teaching requires time gaps, which is contrary to the traditional learning mechanism. Hereby I argue that there are time compression diseconomies in learning by teaching and the frequent acquisitions would reduce the efficacy of learning by teaching.

Hypothesis 4: Higher frequency in the parent's acquisition experience decreases the positive relationship between the parent's performance superiority to the target at the time of merger and the loan performance of the parent's affiliates

Methodology

In this study, I test the impact of learning by teaching on a firm's loan quality management. In this section, I describe the comprehensive sample of U.S commercial banks, followed by the model specification and descriptions of key variables.

Data

The U.S. banking industry is a suitable context for this study for the following reasons. Strict regulation and standardized reporting requirements allows to obtain data for the full census of US banks. Regulation also allows identifying a broad set of characteristics, such as loan inputs and outputs, or various size measures both at the parent (bank holding company) and affiliate (bank) level. I collect archival data from the FDIC Research Database of quarterly financial data for all commercial banks filing the Y-9C (Call Report). Each bank is allocated a unique certificate number by the FDIC and I take the bank holding company (BHC) as a parent firm that acquires its constituent banks. I merge the FDIC Call reports that provide extensive financial data of each individual commercial bank and the link between holding companies and affiliated bank with the Income Statements and Balance Sheet data collected from the WRDS database. This allows me to construct a panel with loan portfolio information and the three distinct measures of forecasting: loan loss provisions, non-performing loans, and charge-offs. The panel provides me with a total of 1360 BHCs involving in acquisition cases over years 1998-2009.

Measures

Dependent variable In order to capture the performance improvement in loan risk management, I take the *loan quality* as the dependent variable. Loan quality is measure by subtracting the fraction of loan loss provisions to total assets of the bank holding company from 1. I measure the dependent variable by calculating the weighted average of the parent firm's existing affiliates prior to the acquisition. In order to tease apart any direct impact, whether it is negative or positive, of the performance level of the target firm that has been

acquired, the dependent measure excludes the performance of the actual bank who engaged in the acquisition and integration practice.

Independent variables The parent's performance *superiority* is measured in order to test the identification of learning by teaching. When the parent firm superiority to the target firm is greater, it is argued that the integration style would likely be a top-down management triggering extensive amount of teaching rather than allowing interactions that bears potential opportunities to exchange superior capabilities between the parent and target. I use two different types of superiority measures, one is constructed as the difference in loan quality between the parent and target firm and the other is the difference in return on assets (ROA) between the two firms as a robustness check.

Moderating variables To test the interaction effect in hypotheses 2, I create a *portfolio distance* measure using the Cosine similarity distance. As for the interaction effect in hypotheses 3, I calculate the *affiliate similarity* in terms of portfolio composition among the parent firm's affiliates prior to the focal acquisition in a similar fashion as in calculating *portfolio distance*. Lastly, in order to test the interaction effect proposed in hypotheses 4, I count the *frequency* in acquisitions using the average number of acquisitions that a single bank holding company conducts within a given year.

Control variables Traditionally, firm size is viewed as to play a major role in acquisitions (Lang and Stulz, 1994; Rumelt, 1974; Demsetz and Strahan, 1997). Firms with greater asset sizes are arguably more capable and have greater absorptive capacity that enhances the firm's learning capability. Because of the skewness in asset size across banks in the industry, I take the log of *total assets* of each bank to control for any size effects. I also include values of quarterly *state personal income*, *state population*, *number of*

competitors, and *state herfindahl index* to control for state specific characteristics as well as the economic microenvironment factors. While it is more common to use GDP instead of personal income index to capture macroeconomic effects, due to the unavailability of GDP data at the state and quarterly level, I proxy this measure with the personal income that shows a 99.58 correlation with GDP data. To control for scale and scope, I include the *number of banks* held by a single bank holding company as well as the *number of states* that a single bank holding company operates in.

Model Specification

The first model uses a fixed effect regression model to control for any particular firm-year fixed unobservable effects.

Baseline Model

$$\begin{aligned}
 \text{Loan Quality}_{(i-j)t+1} &= \beta_0 + \beta_1 \text{RelativeSuperiority}_{ijt-1} \\
 &+ \beta_2 \text{RelativeSuperiority}_{ijt-1} * \text{PortfolioDistance}_{ijt-1} \\
 &+ \beta_3 \text{RelativeSuperiority}_{ijt-1} * \text{AffiliateHomogeneity}_{ijt-1} \\
 &+ \beta_4 \text{RelativeSuperiority}_{ijt-1} * \text{AcquisitionFrequency}_{ijt-1} \\
 &+ \text{Controls} + \varepsilon
 \end{aligned}$$

Where, $\text{Loan Quality} = 1 - (\text{LLP} / \text{Total Assets})$

$i = \text{parent firm}$

$j = \text{target firm}$

Lambda variable

I use a Heckman selection model in order to correct for possible endogeneity bias. This is to control for any underlying reasons that allow certain firms to engage in poor performing firm acquisitions. Because of the high likelihood of the market hitting the bank if they acquire a firm with low performance, there might be a reason to why some firms choose to acquire low performers and to what allows them to do so. In the first stage, I derive the inverse mills ratio lambda term by modelling the parent firm's propensity to acquire a poor performing firm as a function of the tier 1 capital. Tier 1 capital is a typical measure of the capital adequacy of a bank that consists of the common stock and disclosed reserves. The funds are considered as the primary support for any losses to the bank that would protect its regular businesses from financial difficulty. Arguably, a greater amount of tier 1 capital would allow buffers to afford any potential losses caused by acquiring a poor performing target firm. In the second stage, the inverse mills ratio lambda term is included in the regression (model 3 in table 6) to correct for endogeneity of low performing target acquisition.

Final Model

$$\text{Loan Quality}_{(i-j)t+1}$$

$$\begin{aligned} &= \beta_0 + \beta_1 \text{RelativeSuperiority}_{ijt-1} \\ &+ \beta_2 \text{RelativeSuperiority}_{ijt-1} * \text{PortfolioDistance}_{ijt-1} \\ &+ \beta_3 \text{RelativeSuperiority}_{ijt-1} * \text{AffiliateHomogeneity}_{ijt-1} \\ &+ \beta_4 \text{RelativeSuperiority}_{ijt-1} * \text{AcquisitionFrequency}_{ijt-1} + \beta_5 \lambda \\ &+ \text{Controls} + \varepsilon \end{aligned}$$

Where, Loan Quality = 1-(LLP/Total Assets)

i=parent firm

j=target firm

Results

Table 2 & 3 summarizes the data of 1360 bank holding companies that involved in acquisitions expanded into a panel providing me with 2559 observation points over years from 1998 to 2009. Because I use a 1-year lag to construct the dependent variable, I dropped year 2009 from the analysis. Also, I purposefully use data from prior to the 2007 – 2009 financial crisis as the acquisition pattern of banks was altered due to institutional intervention. Table 4 shows correlations matrix for the explanatory variables and controls.

Tables 5 shows the results from a fixed effects model by the unique bank id and given year that tests the proposed hypotheses. In model 1, I test for the control variables in isolation. Some of the control variables merit attention. The state level competition represented by the Herfindahl index significantly increases the quality of loans suggesting that the more concentrated the local market is, banks are arguably provided with greater capacity to focus on exploiting from current operations rather than having managerial capacity caught up by the competitive nature of the market. Bank holding company size is represented by total assets and the number of banks that they hold, which shows positive and significant impact on the overall banks' loan quality. This could infer to the fact that larger organizations are composed of greater number of agents that pool their knowledge and capabilities that lead to greater degree of learning (Posen, Martignoni, & Levinthal, 2012). To measure a bank's experience in market diversification, I use the number of states

where a single holding company operates in, of which coefficients show positive and significant impact suggesting that past experience in multiple markets improves loan quality through honing the capability sets of the holding company.

Models 2-8 examine the main effects of parent superiority and interacting variables on the improvement of loan quality that arguably indicates the effect of learning by teaching. Results support Hypothesis 1 with positive coefficients and significance at the 0.01 level. This confirms the argument on the impact of the relative superiority of the parent firm to the target firm on the extent to which the focal parent firm learns through teaching the target and consequently improves the overall loan performance across all affiliates held by the parent firm. I add loan proximity between parent and target, loan similarity among parent's affiliates, and frequency in acquisitions within a given year to the model, which tests the effect of the moderating conditions of learning by teaching. Results support Hypothesis 3 and 4 with a negative coefficient and significance at the 0.01 level suggesting that diversity in parent's affiliates will hinder the efficient diffusion of learning by teaching and that frequent acquisitions would decrease the available content for learning by teaching. One possible reason to why Hypothesis 3 would not hold could be because the degree of teaching is dominated by the performance difference between the parent and target firm regardless of whether there are certain skills to be learned from the target. Moreover, if it were the skills that are being acquired from the target firm that contributes to future performance improvement, then we could expect the proximity variable to have a negative and significant effect.

Because one may concern the existence of selection bias towards superior bank holding companies engaging in poor performing target acquisitions and the endogeneity

issue associated with the context, I conduct a robust test using a Heckman selection bias model. As the exclusion restriction, I use the tier 1 capital level that would arguably affect the propensity to acquiring poor performing firms. Because the excess capital allows a buffer for the temporary loss that incurs from the underperforming target bank until the parent transfers superior capabilities and brings the target up to standards, higher tier 1 capital level allows the bank to take greater risks in the choice of their acquisition target. Yet, I find no theoretical evidence that a greater level of tier 1 capital directly influences the quality in loan management, which provides validity to the choice of exclusion restriction.

As shown in model 1 - 4 from table 6, the main results and the supporting result for hypothesis 4, which argues that the relatedness in knowledge across a parent firm's affiliates facilitates the application of the benefits that stem from learning by teaching, remain consistent with the fixed effects analysis.

Discussion

Overall, the empirical findings are consistent with my predictions and support the theoretical arguments. Specifically, I find that acquiring firms that are superior to the acquired target are more adept to improving loan performance. This effect is more pronounced when the parent firm's affiliates are homogeneous and when there have been less opportunities to learn from integration in previous terms. I do not find any statistically significant impact of portfolio similarity between parent and target firm on the efficacy of learning by teaching. Results suggest that the decision on the extent to which the firm

involves in a teaching activity is most likely dominated by the performance difference and not the difference in skill sets.

By empirically confirming the predictions, this study provides implications to the literature in the following ways. This paper contributes to the vast learning literature in strategic management and organization theory by providing a new theoretical construct that extends our understanding of knowledge acquisition and knowledge management. Specifically, I propose a learning by teaching mechanism where firms that involve in activities such as post-merger integration or consulting and therefore associate with extensive amount of training can develop superior knowledge and capabilities as a result of a teaching opportunity. Although learning by teaching is a well-known topic in other areas of social studies and has been studied largely in experiments to investigate the effect of teaching on individuals' performance (Katona, 1940; Bargh and Schul, 1980; Benware & Deci, 1984; Fiorella & Mayer, 2013; Fiorella & Mayer, 2014), little work has been done on the theoretical development and, to the best of my knowledge, this dissertation is the first to study the applications of learning by teaching at the organizational level.

This study also contributes to the acquisition literature by providing a more fine-grained integration type that considers the explorative and exploitative benefits when absorbing a new entity. In their seminal work, Haspeslagh and Jemison (1991) develop a framework of integration types that are determined by the need for interdependence to create value and the need for autonomy. The authors propose three major types of integration: absorption, preservation, and symbiosis. Unlike preservation and symbiosis where learning comes from the acquisition of unique knowledge and capability sets, it is quite unclear to how learning occurs in an absorption type of integration. Hence, I focus

on the absorption integration type where little autonomy is granted and therefore major training is involved in order to help the acquired entity to adapt to the acquiring firm's systems and routines. The degree of interdependence of knowledge and capabilities from both acquired and acquiring firm required to create value plays an important role in distinguishing between a two-way transfer and one-way transfer of knowledge. In Haspeslagh and Jemison's work (1991), the interdependency of knowledge and capabilities between the two merging entities bears an assumption that the direction of knowledge flow is in both directions; the acquiring firm learns from the acquired firm and vice versa. However, in many real cases of acquisitions, absorption is chosen as the form of integration although there is no interdependence of knowledge or capabilities between the merging firms such as in the case where firms acquire for scale expansion reasons. Under such circumstances, the direction of knowledge flow is highly likely a one-way capability transfer and the learning by teaching mechanism is arguably most salient when there is slack managerial capacity not being occupied by absorbing new information. This dissertation contributes to the acquisition literature by introducing a learning mechanism that triggers an exploitative type of absorptive integration.

Finally, this paper also contributes to the evolutionary literature through a provision of a wider application of dynamic capabilities and absorptive capacity. Firm expansion and integration causes much change and disruption to within the focal firm's boundaries and, also, to the external competitive landscape. Therefore, firms that experience any type of acquisition and integration are revealed to the necessity of reconfiguring its capability sets in order to conform to the dynamic change (Teece, Pisano, Shuen, 1997; Eisenhardt and Martin, 2000; Winter, 2003; Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, and

Winter ,2009). While substantial research has explored the antecedents and significance of dynamic capabilities, findings in this area of research are limited to the firm components and conditions interconnected to the market environments and the development of the constituents of dynamic capabilities. Many prominent scholars have theorized in prior research on the discrete types of dynamic capabilities such as adaptive, absorptive, and innovative capabilities that are developed within the firm in accordance to the firm's environmental change (Teece et al, 1997; Gibson and Brikshaw, 2004; Cohen and Levinthal, 1990; Capron et al, 1992; Wang and Ahmed, 2007). However, it is yet to be fully unraveled how such different types of dynamic capabilities can interact with one another to create greater value in one's capabilities. This study sheds light on the evolutionary nature of knowledge and capabilities during a special situation of post-merger integration where a teaching opportunity promotes the intertwined development of adaptive, absorptive, and dynamic capabilities that lead to capability updating and improvements in the focal firm's routine and operating processes.

This study is not without limitations. First, the analysis has its limitations in the indirect measures of learning by teaching. Although I try to capture the teaching opportunity through constraining the environment to where parent superiority derives teaching, a more direct measure of teaching such as number of teaching materials or the amount of investment in integration could support a more rigorous analysis. Second, while this paper is limited to the learning by teaching opportunity in post-merger integrations, future work can also examine other empirical contexts. For instance, teaching can occur under circumstances where employee training is heavily implemented such as in executive training. Future research may explore a more generalized application of learning by

teaching effects. Finally, future work can build from our predictions and develop theory the learning by teaching mechanism by testing for additional moderating effects. Identifying conditions that would lead to more salient effects of learning by teaching would supplement findings from this paper.

Chapter 5

Empirical Study Testing Learning by Teaching in Loan Risk Forecasting

Introduction

This study explores the impact of learning by teaching on the improvements in loan risk management that are related to the capabilities of bank managers. While the previous empirical study in Chapter 4 explored the efficacy and diffusion of learning by teaching by examining the performance of the parent firm's affiliates, which excludes the actual firm who acquired a new entity after an acquisition, this chapter investigates the direct impact of learning by teaching on the firm who actually engages in the first-hand teaching experience. I look into the improvement of a particular task of timely loan loss provisioning, which is arguably less likely to be affected by numerous conditional factors as do general performance measures.

Many great scholars in the field of strategic management and organizational studies have advanced our understanding by empirically testing the impact of organizational learning using various performance measures. Much scholarly attention has focused on the market- and accounting-based performance using ROA, ROE, or stock price as the response variable. For instance, Chatterjee, Lubatkin, Schweiger, and Weber (1992) investigate how the acquisition of new knowledge and capabilities can convert into positive returns through the facilitation of organizational cultural fit. In particular the authors look into the increased changes in stockholder value after a related merger. Some studies, on the

other hand, provide evidence of a positive relationship between accumulation of experience or acquisition of knowledge and the firm's symbolic performance as in status, identity, or power (Pollock, Chen, Jackson, & Hambrick, 2010; Ullrich, Wieseke, & Dick, 2005). In their paper, Ullrich, Wieseke, and Dick (2005) find supporting evidence on the impact of integration processes on organizational identification, which in turn imposes influence to firm performances. Another considerable body of research, including the seminal work of Ahuja & Katila (2001), measures the effect of organizational learning on a firm's innovative performance by exploring the increase in innovative activities in terms of patent developments. Despite this theoretical significance and abundance of related studies, the organizational learning literature seems to await further research efforts in terms of identifying learning at a lower level of unit and adopting fresh perspectives towards additional learning mechanisms. In this paper, I try to adopt a more fine-grained measure by looking into the improvement of a particular task, rather than a granular performance measure, as a result of organizational learning by teaching. In particular, I use the Delayed Expected Loss Recognition model widely known in the field of accounting to investigate the improvement in the timeliness of loan loss provisioning at financial institutions.

This paper aspires to empirically capture learning at a task-level and extend our knowledge on the implementation and realization of learning by teaching. Using the theoretical arguments gleaned from the previous chapters in this dissertation on organizational learning by teaching, I focus on the mechanisms that are realized during the preparation stage of teaching rather than the stage of engaging with students. As discussed in previous chapters, the core mechanisms of learning by teaching stems from the reflection of the teacher's knowledge. Numerous theoretical contributions have been made on the

significant role of reflection on individual learning. For example, Boud, Keogh, and Walker (1985) states that reflection is “an important human activity in which people recapture their experience, think about it, mull it over and evaluate it”, and affects the degree of learning from a given experience. The authors argue that reflection is likely to occur towards the end of a learning process, which implies that the focal entity needs to accumulate knowledge and experience before he or she can reflect upon the focal knowledge and learn. This argument is consistent with the theoretical development in education and psychology literature where reflection is recognized as a core mechanism for a teacher’s learning. The role of a teacher is granted with the assumption that the individual is qualified in terms of being knowledgeable in the subject to be taught. Therefore, it is arguable that there is a high probability that a teacher would reflect upon his or her own knowledge related to the subject matter than individuals who are deliberately starting to learn new information.

When teaching other individuals, teachers often reflect upon their own knowledge, which means that the teachers try to transform current complex and challenging information into efficient forms of new knowledge in order to transfer the focal knowledge to other people. In this chapter, I attempt to identify the consequences of reflection at the organizational level where training opportunities trigger firm managers to revisit and reflect upon their current knowledge and reconfigure current operational processes or systems to adopt superior ones. Schön (2017) studies how reflection is implemented upon practitioners in the healthcare industry and suggests that reflection is triggered by a shock or an unusual event. For a physician, the trigger can be an unanticipated result, whether it is good or bad, during an operation. Reflection can also occur with a collection of incidents.

The practitioner may encounter multiple outcomes when dealing with a group of patient or specific disease (Rolfe, Freshwater, & Jasper, 2001). Even casual conversations with colleagues or patients or reading articles from the newspaper or journals can be triggers to reflective learning as does organizational audits of practice in which physicians obtain related information to the focal practice (Lockyer, Gondocz, & Thivierge, 2004). When reflection is triggered at a group level of an organization, the learning can be diffused throughout the organization via internal networks or official strategic planning.

As much as there are factors that trigger reflective learning, there are, in fact, conditions that hinder one from reflecting upon knowledge. Lockyer, Gondocz, and Thivierge (2004) discovers a positive relationship between personal experiences and organizational feedback and the degree of reflection while lack of time, available colleagues, and social networks are conditions that impose a negative impact on an individual's degree of reflection. A member of an organization is expected to meet certain demands in terms of professional and social commitments. Often times these individuals are both physically and cognitively caught up in regular operations and meetings and end up utilizing maximum capacity of one's own cognitive capabilities. When individuals lack time by getting pulled into multiple tasks simultaneously, they do not have the mental capacity to explore new connections between existing or new knowledge. A teaching activity, however, secures this opportunity that other tasks would generally provide less because teaching requires an investment of time and effort towards preparing teaching materials. In other words, the act of teaching legitimately creates the time to revisit current relationships across fractions of knowledge and to create new inferences.

At a bank, teaching takes place to serve various purposes. It could occur when the

bank needs to bring new hires up to speed for daily operations, allocate new responsibilities and roles to current employees or executives, or improve systems, standards, or structure as part of a top-down strategic purpose. One of the primary concerns of a commercial bank is to improve operations and standards to respond to current and future environmental uncertainty. There are largely three types of risks that challenge a bank's performance. The first type is credit risk, which is the possibility of borrowers failing to meet the payment obligations on time. The second type is market risk, which refers to losses incurred due to fluctuations in the economy and market prices. The last type of bank risk is operational risk defined as the loss from failed internal processes or from external events. The banking system as a whole regularly discusses and seeks for new standards and creates additional safety nets to prevent bank failure caused by such unforeseeable hazards. Because a bank's performance highly relies on how well the bank prevents itself from negative shocks from bank risk, it is one of the biggest concerns of a bank manager to look out for supervision and improve daily operations. The current chapter focuses on one of the core efforts promoted by the Basel Committee on Banking Supervision (BCBS) to reduce bank risk, which is to incorporate future expected losses into current provisioning practices. The Basel II and III Accord introduced new accounting methods to protect banks from procyclicality, which includes the promotion of forward-looking provisioning. Accounting research suggests that forward-looking provisioning reflects greater timeliness and accuracy of a bank manager's estimation to loan losses. Arguably, banks that had superior managerial and operational capabilities adopted the new standards before Basel II and III Accord strongly emphasized the significance of the forward-looking provisioning practice after the 2001 and 2007-2009 financial crisis. This chapter discusses how a teaching

opportunity could possibly increase the probability of a bank adopting superior financial standards. Banks that engage in mergers and acquisitions face the need to train new employees from the acquired bank and convert the acquired bank's systems and procedures of general operations to meet the acquiring firm's standards. During the integration process, the acquiring bank's managers who engage in training opportunities are exposed to the opportunity to reflect upon their current knowledge base and to seek better ways of risk management.

The empirical analysis in this chapter takes the privilege of the available data prior to and after the introduction of the Basel Accord, which was a result of poorly managed bank risk practices prompting additional advisory from the BCBS. After each 2001 and 2007 – 2009 financial crisis, regulations have strongly required banks to pursue forward looking provisioning instead of the commonly used incurred loss approach. Later in this chapter, I will address in detail the post-crisis Basel Accord where documentation and re-evaluation on loan loss measures were suggested in their guidelines to worldwide commercial banks. The use of the Basel Accord guidelines allows us to explore how some firms adopted superior capabilities related to timely and accurate documentation of loan losses prior to the intervention of the BCBS while others were enforced by the BCBS to catch up on this better practice later after the post-crisis regulatory implementations. While it is argued that firms who were exposed to the opportunity to learn from a teaching opportunity had already improved risk management by exerting greater timeliness and accuracy of loan loss provisioning compared to those who did not have the opportunity to learn by teaching, institutional intervention eases the amount of difference between the two groups by enforcing regulation that would substitute the effect of learning by teaching. I

adopt a Delayed Expected Loss Recognition model widely known in accounting research to test the efficacy of learning by teaching at a task-level.

This study contributes to the organizational learning literature by empirically testing the effect of a novel learning mechanism at the firm level by capturing the impact of teaching on the firm who directly engages in the knowledge transferring activity. While it is a common challenge to researchers in organizational studies to empirically measure the effect of learning per se, I try to track down the learning effect using a proxy of timeliness in loan loss provisioning. Second, this study finds its novelty in the empirical study with the available data prior to and after two incidents of financial crisis. The guidelines promoted by BCBS and the publication of Basel II and III after the financial crisis provides a natural setting where banks changed their behavior and adopted different tools for risk management. Lastly, this study provides pragmatic implications for firm managers. With the full spectrum of organizational learning taking place, firm managers can consciously look after the benefits they can rake during an integration process or annual employee training program. I will discuss future research opportunities at the end of this section.

Theory and Hypotheses

Within the context of firm acquisitions, I argue that the acquisition of a target firm yields a learning by teaching effect to the acquiring firm through a knowledge restoration and capability reinforcement process during the preparation and implementation of capability transmission from the acquirer to the target firm. Transferring knowledge and materials to an audience that may not own the complementary knowledge or capabilities

requires an interim treatment on the material by the “teacher” in order to make the information of interest easier to understand. The advantages of learning by teaching can be easily found in, but not limited to, industries where firms involve in licensing contracts or acquisition activities. This study examines the US commercial banking industry from 1998 to 2015 to exploit a unique setting provided by the 2001 and 2007 - 2009 financial crisis. After the inter-state banking deregulation in 1984, U.S. commercial banks were actively engaged in inter-state banking expansions and acquisitions (Amel, 1993). When the corporate parents acquire a new firm, the integration process naturally entails the need for the parent company to teach its superior routines and capabilities to its new member. The benefits of the proposed learning by teaching find its difference from synergy effects of diversification in terms of the content that the firm learns. Prior acquisition research focus on the value creation stemmed from combining two of more distinct firms that possess similar or different resources and capabilities (Rumelt, 1974; Montgomery & Wernerfelt, 1988; Harrison, Hitt, Hoskisson, & Ireland, 1991). The main gains to the acquiring firm are identified as improved operating efficiency by taking advantage of economies of scope and scale, superior skill transfer, or enhanced market power (Harrison, Hitt, Hoskisson, & Ireland, 1991). Prominent scholars including Rumelt (1982) and Teece (1980) identifies efficiency created by utilizing resources and capabilities from a particular unit for the operation of another. Economies of scale and scope turned out to be the main supporting rationale behind related diversification. Other scholars suggest that the acquisition of complementary resources and capabilities help overcome any weaknesses of each firm and generate benefits for the acquired entities (Barney, 1986; Hitt & Ireland, 1986; 1985). Finally, a stream of research discusses the gain and loss of market power that is associated

with diversification through acquisitions (Bradley, Desai, & Kim, 1983; Eckbo, 1983; Montgomery, 1985). Despite mixed results and arguments toward whether resource similarity in related diversifications leads to greater returns, a vast amount of research finds little support to the dominant hypothesis (Harrison, Hitt, Hoskisson, & Ireland, 1991; Lubatkin & O'Neill, 1987; Singh & Montgomery, 1987; Hill, Hitt, & Hoskisson, 1992; Jones and Hill, 1988; Nayyar, 1992).

A potential reason why scholars find mixed results is that they neglect a large variable from the equation. It is not merely the improvement in efficiency of procedures or cost savings by sharing market demands and diverse capabilities that derives above or below average market rents but also the development of knowledge and capabilities from restoring, reconfiguring and reinforcing the firm's knowledge base through a teaching or training activity during the integration process. In order to tease out the aforementioned synergy effects, I focus on a particular capability associated with bank managers, the forecasting ability of loan losses, that is less likely to be influenced by cost savings, or economies of scale.

Forward-looking Accounting Financial accounting measures indicate the performance level and financial position of the firm and take on multiple roles in the context of corporate governance. Internally, financial data provides the direction for managerial planning, supports an internal labor market, and assists director monitoring (Bushman & Smith, 2001). In addition, publicly reported financial data provides critical information for external parties such as shareholders, investors, and regulators. Shareholders use financial data as a tool for monitoring whether the firm performance and strategic direction aligns with the shareholders' interest. Similarly, outside investors use

public financial data to analyze the competitive position of the firm within the market and to monitor the use of investments. A large body of accounting research focuses on finding ways to mitigate the agency problem between firm managers and shareholders and to ensure efficient allocation of resources to promising business opportunities. Regulators, on the other hand, concern financial data as a mean to audit a firm's report system and financial status in order to protect investors from the aforementioned agency problems. While relying on the given data provided by insiders, regulators also constantly review the current reporting systems to reduce opportunities for agents to take advantage of in order to serve their own interest and protect the industry from cyclical risks.

In the banking industry, while it is at the bank manager's interest to provide accounting information to external parties for contractual purposes or decision making, regulator's concern lies heavily on reducing the risk of bank failures. Because the incentives of practitioners and regulators do not necessarily align with each other, constant debate has been made to whether loan loss accounting should allow more discretion to bank managers to include future loan losses into current measures. As much as forward-looking accounting allows risk mitigation by being more prudent, concerns to whether bank managers will opportunistically take advantage of the system to smooth earnings and losses remain (Dechow & Skinner, 2000; Wall & Koch, 2000). It is, however, a common voice that more consistent, reliable, transparent, and timely information on a bank's financial performance and risk exposures need to be made available for the public (Bushman & Williams, 2012).

Loan loss provisioning, which has direct impact on the volatility of a bank's performance and risks, is a careful choice made by bank managers following guidelines

and regulations. Unlike other accounting measures that indicate realized loan losses such as charge-offs or non-performing loans, loan loss provisions reflect bank managers' subjective decision and insights that are influenced by environmental factors that may affect the realization of loan losses. Research shows that bank managers can forecast future loan losses using current term macro-economic indicators (Gambera, 2000; Beatty & Liao, 2011). As a result, researchers and regulators argue that the prevalent use of incurred loss model expose banks to pro-cyclical effects and suggest to grant greater discretion to bank managers when predicting future losses and include a broader set of information to the assessment (Bushman & Williams, 2012).

Although the ideal way to test the positive impact of forward-looking accounting on the firm's risk-taking would be to compare directly between firms who adopt an incurred loss model and firms who use a forward-looking model, the implementation of forward-looking accounting was yet to be available for recent research in this domain. Scholars, therefore, have used alternative methods to test the validity and impact of forward looking provisions on firm performance. Bushman and Williams (2012) study the effectiveness of managerial discretionary on loan risk management by exploiting cross-country variations in the degree of managerial discretion on loan forecasting. The core findings suggest that explicit forward-lookingness enhances the market discipline over bank risk-taking.

Greater concerns towards timeliness in forecasting loan losses had risen after the financial crisis in 2001 and 2007 - 2009. Prior to the alarming events the majority of banks were prone towards using the incurred loss model, which was later identified as one of the core factors that increased bank risks.

Based on the theoretical development of learning by teaching mechanisms, I predict a higher likelihood of parent banks who acquire new affiliates switching to a superior accounting model as a result of training acquired employees. When transferring the systems and accounting standards of loan management, the parent bank is likely to revisit their current operations and financial standards and reconfigure current routines to meet up-to-date industry standards. Such behavior can be in part due to the fact that parent firms make pre-emptive strikes prior to knowledge transfer as they do not want to be criticized by the target firm's employees especially during times when organizational conflict and resistance is highly anticipated throughout the integration process. I argue that the increase in the parent's forecasting timeliness and accuracy would represent the results of learning by teaching after an integration process followed by an acquisition. Hereby I predict:

Hypothesis 1: The greater the experience in acquiring firms that perform poorer than the focal firm the greater the extent of learning by teaching that is reflected in the improved timeliness and accuracy in the parent's loan loss provisioning

The Basel Accord

The available data set of at least 5 years prior to and following the initial introduction of the Basel Accord in 2004 allows a privilege to examine a more salient deviation in firm behavior and performance. Because the regulatory and statutory board was concerned with the incurred loss approach, they promoted the Basel Accord guidelines to enforce a forward-looking analysis of bank portfolios. While banks that were capable of the forward-looking approach in forecasting loan losses already implemented

the method prior to the regulatory enforcement, other banks that did not follow this advanced approach were forced to do so by regulation.

Basel II The Basel II Accord has initially been published in 2004 by the Basel Committee on Banking Supervision (BCBS) in order to control regulatory arbitrage and support better risk management (Barr & Miller, 2006; Pattison, 2006; Kane, 2006). Basel II mainly provides standards to the capital adequacy of internationally active banks. Because the Basel Accords are considered more as guidelines than enforcement laws, the implementation of the proposals has been limited. However, the BCBS strongly insists that a full, timely and consistent adoption and implementation of Basel standards is necessary in order to help the banking system become more resilient to economic shocks and encourage a transparent regulatory environment in the banking industry. Basel II introduced a more forward looking provision method. The rationale behind forward looking provisioning was to consider the key business environment and internal control factors in order to manage operational risk and more directly reflect a bank's quality of risk control. Bank supervisors were asked to require the bank to incorporate the sum of expected loss into the regulatory capital requirement. In calculating capital adequacy, bank managers were supervised to be rigorously forward-looking and create possible safeguards in case of any economic events or changes in market conditions that could impact the bank's financial stability. Although the guidelines were not mandated by law, bank managers were made clear that they are primarily responsible for keeping the bank protected with sufficient capital to respond to any risks. The implementation of Basel II Accord guidelines was expected to begin from year-end 2005 and complete by year-end 2008. The economic

downturn and financial crisis in 2007-2009, however, triggered the BCBS to revise and advance Basel II and led to the publication of Basel III Accord in 2010.

Basel III The Basel III Accord was introduced in 2010 and revised in 2011 in response to the 2008-financial crisis to promote more resilient banks and banking systems. The BCBS concluded that the 2008 financial crisis was partially a result of the deficiencies in financial regulation and advanced the Basel II Accord by suggesting increasing bank liquidity and decreasing bank leverage. As did Basel II, Basel III suggests minimum requirements of capital adequacy of internationally active banks in order to control and supervise banks on risk management. The main concerns of Basel III focused on strengthening the global capital framework and introducing a global liquidity standard. Multiple methods were introduced and guidelines were provided, which include 1) raising the quality, consistency, and transparency of the capital base of banks, 2) enhancing risk coverage, 3) supplementing the risk-based capital requirement with leverage ratio, 4) addressing systemic risk and interconnectedness, and 5) reducing procyclicality and promoting countercyclical buffers. Detailed measures were introduced to ensure that banks become more resilient to shocks. One of the key objectives was to, again, promote forward looking provisioning. The BCBS supported changing accounting standards towards an expected loss approach in order to improve the effectiveness of financial reports to shareholders and regulators. The new guidelines of Basel III strongly suggest banks to be more transparent in assessing actual loan losses and to allow estimated losses into the provisions. The BCBS argues that the forward looking provisioning is less procyclical with the expected loss considered into the equation. An observation period began in 2011 and

the full transition and implementation of the Basel III Accord was expected to be done by 2018, which later extended to March, 2019.

Although not by law, the enforcement of Basel Accord provides a useful setting where the revisiting, recombining, and revamping knowledge mechanisms that are predicted to derive from a teaching opportunity in firm integrations were forced by institutions. Due to such regulatory enforcements, I anticipate a reduction in the salience of the learning by teaching effect after the financial crisis. Hereby, I argue:

Hypothesis 2: The Basel Accord requirements provides all firms with learning that is likely to stem from teaching and, hence, decreases the salience in learning by teaching effect addressed in H1

In the following sections, I present an empirical model that will examine the role of learning by teaching using data from the U.S. banking industry from 1998 to 2015. I test how the forecasting quality of bank managers at the acquiring bank is affected by the teaching opportunity from integration processes.

Methodology

I test the impact of reflective learning on a firm's timeliness and accuracy in loan loss provisioning. In this section, I describe the comprehensive sample of U.S commercial banks prior to and after the promotion of forward-looking provisioning by BCBS, followed by model specifications and descriptions of key variables.

Data

I use an extensive data set from the U.S. banking industry in years 1998 – 2015 where it provides a unique setting of prior to and after the promotion of forward-looking loan loss provisioning by BCBS, initiated in 2004, allowing me to capture the deviation of firm's ability to forecast with and without the learning by teaching effect.

I use the FDIC Call reports and merge the data set with the Income Statements and Balance Sheet data collected from the WRDS database. Because banks are assigned with a unique id by the FDIC, it is convenient to match these different data sets and create an extensive panel that allows access to the financial performance, loan portfolio, and acquisition information of individual banks. The panel provides me with a total of 12129 banks and 4665 acquisition cases over the years of 1998-2013. The reason why I take the bank as the unit of analysis instead of the holding company is because I intend to capture the immediate learning effect prior to the diffusion process measured as timeliness in loan loss provisioning. Because this particular data set is constructed at a quarterly level, I can look into instant changes in action made by bank managers in their loan loss provisioning standards. Another benefit of having a quarterly breakdown of the data is that it allows me to measure the beginning of quarter capital that affects the motivations of bank managers to manipulate provisions for smoothing earnings purposes.

Model Specification

The risk set is composed by each bank and its corresponding states in each quarter year. I adopt a forecasting model from accounting research to examine managers'

capability in timely and accurate loan loss provisioning (Beatty and Liao, 2011; Bushman and Williams, 2015). This Delayed Expected Loss Recognition model departs from the incurred loss model in terms of the inclusion of future forecasts in its calculation of current provisions. The incurred loss model was required by the Financial Accounting Standards Board (FASB) and International Accounting Standards Board (IASB) while criticized later by the Financial Stability Forum (FSF) (2009) over the fact that procyclicality emerges due to the nature of the model deriving its measures from past events or environmental conditions of the past or at the statement date (Beatty and Liao, 2011; Bushman and Williams, 2015). There were elevated concerns over the fact that bank managers can take advantage of the amount of discretion that the incurred loss model allows by opportunistically delaying anticipated losses into current term provisions. When managers delay recognition of losses from current term provisions, the true risk level of the bank's loan portfolio can be obscured (Bushman and Williams, 2015). The Delayed Expected Loss Recognition model is a devise that mitigates such concerns. By including the future term of expected loss into the equation of current term provisioning, timelier banks in terms of loan loss provisioning are recognized via the increased adjusted R-square compared to that of the base model that omits the future forecasting term. The below describes the two models:

$$LLP_t = \beta_0 + \beta_1 \Delta NPL_{t-1} + \beta_2 \Delta NPL_t + controls + \varepsilon \quad (1)$$

$$LLP_t = \beta_0 + \beta_1 \Delta NPL_{t-1} + \beta_2 \Delta NPL_t + \beta_3 \Delta NPL_{t+1} + controls + \varepsilon \quad (2)$$

where,

LLP_t : loan loss provisions (change in allowance) at time t

ΔNPL_{t-1} : change in non-performing loans at time $t-1$

ΔNPL_t : change in non-performing loans at time t

ΔNPL_{t+1} : change in non-performing loans at time $t+1$

The basic idea is that the increased adjusted R-square derived by deducting the adjusted R-square of model (1) from that of model (2) indicates greater timeliness in forecasting loan losses. Also, the Delayed Expected Loss Recognition model compares the strengths of coefficients across different time periods. The timelier and more accurately managers forecast, the greater correlation between recent and future data and a firm's current term provisioning.

I test the hypotheses by examining the timeliness of provisioning as a function of historic data of non-performing loans, forecasted data of future non-performing loans, and the exposure to affiliates through acquisitions. In order to capture learning by teaching effect following an acquisition decision, I interact the incremental non-performing loans at each term $t+2$, $t+3$, and $t+4$ with a dummy that indicates an acquisition made by a superior bank relative to the target bank. The assumption behind this argument is that the more superior the acquiring firm is to the target firm the greater amount of teaching and transferring knowledge instead of learning new capabilities from the target firm. The reason why I use $t+3$ as the baseline period is to allow learning that initiates in the prepatation stage of teaching ($t-1$) and allow time for the learning to reflect in firm behavior (typically 1 year lag, which is 4 quarterly lags). The baseline model that I use is as the following:

$$LLP_{t+3} = \beta_0 + \beta_1 \Delta NPL_{t+2} + \beta_2 \Delta NPL_{t+3} + \beta_3 \Delta NPL_{t+4} + \beta_4 \Delta NPL_{t+2} * \text{sup_acquisition} + \beta_5 \Delta NPL_{t+3} * \text{sup_acquisition} + \beta_6 \Delta NPL_{t+4} * \text{sup_acquisition} + \text{controls} + \varepsilon \quad (3)$$

where,

LLP_{t+3} : loan loss provisions (change in allowance) at time $t+3$

ΔNPL_{t+2} : change in non-performing loans at time $t+2$

ΔNPL_{t+3} : change in non-performing loans at time $t+3$

ΔNPL_{t+4} : change in non-performing loans at time $t+4$

$\text{sup_acquisitions}_t$: acquisition flag in time t made by superior parents, 1 if a superior bank acquired a relatively low performing target bank in time t and 0 otherwise

Following the work of Beatty & Liao (2011) and Bushman and Williams (2015), LLP is the loan loss provision divided by lagged term total loans and ΔNPL is the change in non-performing loans divided by lagged term total loans. This model is based on the assumption that bank managers on average accurately anticipate future losses according to the patterns of current loan payments and that bank managers have the discretion to include forward looking judgements into their quarterly loan loss provisions. Therefore, I can use the actual future non-performing loans as a measure of timely forecasting.

Natural Shock

The introduction of the Basel II Accord in 2004 provides a natural setting where many banks were required by regulation to update their accounting measures in financial reports. The BCBS released requirements that included the disclosure of qualitative information related to its procedures in regulatory financial reports as the majority of banks

did not document their procedures in the development of operational risk measurement and management system (Bushman and Williams, 2012). Risk management involves efforts that are embedded within the firm's daily activities including identifying risks, measuring risks, developing a monitoring program, reporting risks to management and board, etc. Regulations emphasized the importance of providing transparent information related to operational risk management to market participants, forcing banks to document their activities in detail. This unique setting provides an advantageous position to this research that allows us to identify the effect of learning by teaching through the comparisons of two distinctly different environments: before and after the introduction of the 2004 Basel Accord. In particular, I look into the difference in forward-looking provisioning behavior of banks prior to and after the regulatory supervision. It is argued that firms who learned from teaching a newly acquired affiliate would improve in terms of timely forecasting before the introduction and enforcement of the Basel Accord guidelines. Yet, after the BCBS strongly promoted forward-looking provisioning in order to reduce procyclicality issues and protect banks from bank failure, the salient effect of learning by teaching expects to dampen as all banks begin to adopt the superior financial reporting standards even without the learning opportunity that roots from a teaching activity.

Variables

Dependent variable In order to capture the performance improvement in loan loss forecasting, I take the *loan loss provisions* scaled by lagged total loans as the dependent variable at time $t+3$.

Independent variables Because the forecasting capabilities are anticipated to improve after a teaching experience during post-merger integrations and because the effect of learning by teaching is argued to be greater when the acquiring firm performs better than the acquired firm, *superior parent acquisitions* is interacted with the change in *non-performing loans* at time $t+2$, $t+3$, and $t+4$ in consecutive terms. The superior parent acquisition variable is a binary dummy where 1 indicates a merger made by a bank whose performance is relatively superior to the target bank's and 0 indicates otherwise. The parent's performance superiority is measured in terms of the difference in return on assets (ROA) between the two firms.

Control variables *total assets* are included to control for size effects of each bank as size can affect the degree of engagement in acquisitions as well as learning capabilities. The typical state controls such as quarterly *state personal income*, *state herfindahl index*, *number of parent level banks*, and *number of competitor banks* are included into the analysis. Because of the unavailability of GDP data in quarter terms, I use state personal income to control for and economic microenvironment factors. In order to control for any diversification effects by acquiring a target bank with distant loan portfolios, I include a proximity measure, which is an angular separation measure using the loan composition and calculates the cosine value between the parent and target bank's loan portfolios. The greater the proximity measure (maximum value=1) the closer the two loan portfolios, which implies similar capabilities between the two merged banks. Also, to control for any geographical expansion effects, I include a neighbor state dummy where 1 indicates an acquisition between banks from adjacent states. Because loan loss provisioning is exposed to a bank manager's discretion, there is a possibility that the bank

manager intends to delay loan loss recognition or to purposefully include future losses into the current term provisioning. In order to control for any opportunistic behavior by bank managers such as smoothing earnings, I include the *tier 1 capital level*, and *beginning quarter earnings before loan loss provisions* of the bank (Bushman & Williams, 2015). All the models include year and quarter dummies to control for any annual or quarterly industry specific effects.

Results

The summary statistics and correlation matrix for my explanatory variables and controls are shown in Tables 7 - 9. Due to concerns on the collinearity between the lagged terms and interactions, I orthogonalize the measures of concern that include the consecutive terms of incremental non-performing loans and its interactions.

The results for the fixed effects regression using the Delayed Expected Loss Recognition model prior to the introduction of the Basel II Accord is shown in Table 10 and are largely congruent with the theoretical arguments. The main effects of the incremental non-performing loans suggest a prevalent use of incurred loss provisioning where the main variable of delta non-performing loans at t+2 and t+3 show a positive and significant impact on the provisioning in t+3 while the loan losses in t+4 show no effect. When the main variables are interacted with acquisitions by superior parents, however, the magnitude of the incremental non-performing loan in t+4 becomes larger with a positive impact on current number of provisioning.

Table 11 provides evidence that the behavior in loan risk management differs across parent banks depending on whether they acquire a high performer or low performer as the

target for merger. Again, this subsample analysis is conducted on banks prior to the introduction of Basel guidelines.

The positive and significant effect of delta non-performing loans in t+4 indicate that a superior parent relative to the target is engaged in forward looking provisioning compared to inferior parents. The results imply that superior parents who try to improve the target's performance, engage more in a teaching activity and learn how to be more prudent in terms of loan risk management while inferior parents lack the opportunity to learn by teaching. The significant and negative coefficients of the change in non-performing loans at t+4 variable for the inferior parents suggest that many banks who lack a learning by teaching opportunity engaged in smoothing earnings rather than being cautious and careful in terms of their loan loss management. The t-test scores came back at 0.06 suggesting significant difference between the two parent groups at a 0.1 level.

Table 12 shows the results for post-Basel Accord bank risk management. The results indicate much less magnitude in the interaction terms between delta non-performing loans at t+4 and parent superiority. To get a better idea of the behavioral difference between superior parents and inferior parents, I conducted a subsample test of which results are depicted in Table 13.

The results show a significant loss in magnitude of the inferior parents engaging in smoothing earnings. In order to overcome the power issue that can be raised in the previous subsample analyses, I conducted a differences-in-difference test to investigate the impact of Basel enforcements restricting the data to only the firms that acquired another bank throughout the sample period.

I include the time variable where time=1 for post-Basel years while 0 in pre-Basel years. The dummy variable for treatment effect indicates 1 if the parent bank was relatively inferior to the target bank it acquired and 0 otherwise. The reasons I assigned the treatment variable in this fashion is because the Basel Accord is hypothesized to have impact on the behavior of inferior banks who were not following a forward-looking provisioning standard due to the lack of learning by teaching. Results suggest that the inferior parents improved in terms of their timeliness in loan loss provisioning after the introduction and enforcement of the Basel II Accord, which is congruent with the theoretical arguments in this Chapter.

In order to check the relationship between a bank's ROA and the propensity to adopt a forward-looking provisioning model, I ran a regression between subsamples of firms above the mean ROA of 0.0065916 and those below. Table 15 shows the behavior of superior firms generally taking on greater risks rather than using a careful provisioning model. Inferior firms on the other hand solidly use an incurred loss model in calculating their allowances. The correlation between firm ROA and the extent to which a bank would select to acquire a poor performing bank was 0.0048. Also the scatter plot in Figure 3 suggests that the superiority in performance does not affect the degree to which a bank would engage in acquiring a poor or strong performer.

Discussion

Overall, the empirical findings support the theoretical perspectives of this study on learning by teaching, particularly at banks who acquire new affiliates. I hypothesize that bank managers become timelier in terms of recognizing current and future loan losses after they teach their new affiliate and, hence, reflect the forecasted amount into current

provisioning. Results are consistent with this argument in that non-performing loans in future terms (t+4) highly correlates with current term (t+3) provisions for firms that have superior skills in loan loss forecasting, namely firms that acquired a new bank and learned from their own knowledge during the course of improving the new affiliate's performance. It is inferred from the results that banks who undergo an integration process learn from their teaching experience and improve their current routines and processes. The assumption behind the arguments is that superior parent banks relative to the acquired target bank engages in a greater degree of teaching compared to those who acquire high performing banks. This is because when parent banks acquire superior banks, there is greater amount of capabilities to learn from the target bank and due to the bounded rationality of managers at the parent bank the extent to which the parent bank can learn from a teaching activity becomes limited. The results support this argument by showing a positive and significant effect for the interaction terms between the incremental non-performing loans at t+4 and the dummy variable of acquisition by superior parent banks.

Several supplementary analyses support the robustness of the primary tests. The robust check using a differences-in-difference model also indicate that superior parent banks were associated with timelier loan loss forecasting whereas this salience disappeared post-Basel. Results suggest that the theoretical arguments of the learning by teaching effect hold.

Taken together, this study makes a significant contribution to the large body of organizational learning literature by empirically testing the effect of a novel learning mechanism - learning by teaching – at the focal bank who directly acquired a new bank. A major concern within the organizational literature is the empirical difficulty in measuring

learning. Many scholars infer learning by the positive correlation between an accumulation of activity or acquisition of new resources and capabilities with the improvement of firm performance. Learning, however, is neither a necessary or sufficient condition for improving firm performance. Performance improvement can result as pure luck without intentional behavioral changes by the firm (Tsang, 1997). Also, the increasingly complex and dynamic environment obscures the direct impact of firm learning on performance. It is argued that even with advanced analytical skills, it is often difficult, if not impossible, to pinpoint the causal effects and relationships between events (Tsang, 1997). In the present study, therefore, I try to rule out the probability of luck as well as unobservable environmental impact on the efficacy of learning by measuring the increase in *timeliness of bank's decision making* as, unlike other performance measures, timeliness is less prone to the effect of luck. Because it is challenging to capture the detailed mechanism or breakdown effect of learning from the increase in performance measures, I try to narrow down the identification of learning effect to the task level where managers can improve specific skills or processes as a result of learning by teaching. I do not argue that this paper survives from the concerns towards the validity issue of empirical constructs in learning. However, I acknowledge the issues that are prevalent in organizational learning research and attempt to make improvements, though in baby steps, to address such challenges and concerns. While prior research extends our knowledge on 'what' ultimate goal improved as a result of organizational learning, overall, there has been lack of investigating 'how' firms improve after learning from a particular experience. The present study explores such avenues and adopts and develops a model that provides us with more detailed information on organizational learning and its impact on firm performance. Rather than using a granular

measure of firm performance, the present study focuses on the bank manager's cognitive advancement and development in current knowledge and its impact on a specific loan loss provisioning task. The theoretical perspectives help our comprehension on how individual learning can establish at the firm level. Through the bringing back and sharing stage of teaching, subject managers return to their original functional group with advanced knowledge and work collectively with their group members to improve any inefficient routines or processes. This brings our attention to the diffusion and establishment of organizational learning by connecting individual learning to group level learning and to a broader organizational level learning. The teaching activity is in particular useful to identify this connection between units within the organization and the diffusion of learning.

Second, this study has implications on the literature in finance and corporate strategy by providing a thorough explanation to the motivations and implications of firm acquisitions. Also, making use of the available data prior to and after the 2001 and 2007 - 2009 financial crisis allows researchers to explore the change in firm behaviors after a natural shock. The unique dataset allows conducting a natural experiment on U.S. commercial banks that are mandated to report their financial performances on a quarterly basis. To establish the causal effect of learning by teaching on the timeliness in loan loss provisioning, I compare the acquisition made by relatively superior parents over terms before and after the introduction of Basel Accord, which was largely triggered by the crises. With data for the full census of banks in hand, there is much to be learned from the financial crisis for finance and strategy scholars by looking into behavioral differences across firms post-crisis. This study, in particular, benefits from the financial regulations that were strengthened after the focal events. The guidelines promoted by BCBS and the publication

of Basel II and III influenced the behavior of banks in risk management, which provided a natural setting where a treatment (enforcement of the Basel Accord) to all population dampened the learning effect of banks who were involved in a teaching opportunity prior to the overall treatment.

Lastly, this study also suggests pragmatic implications for bank managers and financial regulators. Organizational researchers have long faced the challenge of finding the right balance between theoretical rigor and practitioner value (Miner & Mezias, 1996). Scholars highlight that the purpose of research in strategy and management should not overlook the need to help businesses and organizations solve immediate problems. The present study contributes to the literature in this matter by shedding light on a particular learning mechanism that was, in fact, lost inside the black box of integrations. With the full spectrum of organizational learning mechanisms taking place, bank managers can consciously look after the benefits they can rake from an integration process or annual employee trainings. As mentioned in the McKinsey Quarterly article (October, 2010), leaders at organizations often overlook the importance of connecting teaching materials from training programs to new ways of working. Although one might think that it is the knowledge transfer from the leader to the subordinate that creates most value from training programs, the authors (Smet, McGurk, & Schwartz, 2010) advise that the greatest effect from training is derived from leaders reflecting upon knowledge, advancing their understanding of the focal knowledge, and bringing back the learning to change organizational behavior and improve firm performance. The results from this study also provide implications to the financial regulators. The empirical test in this study shows direct effect of public policies. The behavioral change in banks' loan loss provisioning

provides us with an idea of how the Basel Accord had actually promoted forward-looking provisioning in order to protect banks against systemic failure. By theorizing and documenting the pattern in organizations' actions, regulators can find validity and legitimacy in the regulations that they endorse.

The present study, yet, awaits refinement in future work. Although I try to control for bank managers' opportunistic behavior by using the tier 1 capital and beginning quarter earnings data, there are more factors that would affect the motivations of bank managers to smooth earnings. Also, future research may find further opportunities by looking at different levels of analysis in order to identify the diffusion of learning by teaching. For instance, one could empirically test a bridging hypothesis between task level individual bank learning and the change in the higher level organizational behavior using the bank holding company data. This would allow the researcher to document the constituent bank's behavioral change, which results from a learning experience, as well as the parent level learning by investigating other existing constituent banks' behavioral change. As the theoretical perspective on organizational learning by teaching is relatively new to the literature, I believe various intriguing issues await future research.

Chapter 6

Summary and Future Directions

Summary

In this dissertation, I developed a theoretical perspective on a learning mechanism, namely learning by teaching, that has been overlooked in organizational studies while widely studied at the individual level learning in psychology or education research.

First, I offer the theoretical background of learning by teaching and connect multi-level analyses and theory that provides insight and logic for the application of the proposed learning mechanism to the organizational context (Chapter 2). In particular, I begin with the antecedent concepts from organizational studies that build grounds for the learning by teaching mechanism, which is the center of interest of this dissertation. Then I introduce theory from education research on tutor learning, which describes the learning benefits that teachers gain during the art of preparing teaching materials and interacting with students in the classroom. By borrowing insight from group level learning research, I provide a middle ground for establishing the proposed learning mechanism at the organizational level. Finally, in Chapter 2, I propose the restoration of knowledge, reconfiguration of knowledge, and revamping of knowledge as the three fundamental envisioned mechanisms of organizational learning by teaching.

Chapter 3 provides a brief backdrop to the empirical context where I test my theoretical arguments in Chapter 4 and 5 by summarizing the core financial measures; non-performing loans, loan loss provisions, and charge offs; that are useful in constructing the main variables.

I then empirically test the theoretical arguments by specifying the teaching activity in business as in training opportunities when a parent firm acquires another firm and encounters needs for training new employees of the systems, culture, processes, and standards of the parent firm in order to integrate the two potentially different firms (Chapter 4). Overall, findings from the analyses provide supportive evidence for the learning by teaching effect in the context of post-merger integrations. The results of a longitudinal panel data of U.S. commercial banks from years 1998 to 2007 suggest that bank holding companies, which are the parent banks, improve in terms of loan quality performance after experiencing an integration process. The particular analysis controls for any inflow of superior technology that the parent may learn from the acquired bank and the novelty in this analysis lies where I exclude all possibilities of such alternative learning mechanisms by investigating the performance improvement of the affiliates of the parent bank that excludes the actual bank who acquired the target bank. The learning by teaching effect arguably starts occurring prior to the full integration since reflection takes place mainly during the preparation stage of teaching. Therefore, any diffusion or synergy effects derived from the acquisition are ruled out from the analysis as the timeline I explore is one year after the actual announcement of acquisition allowing sufficient amount of time for the diffusion of learning by teaching but excluding the rest. Results show that acquisitions made by superior firms relative to the target firm are associated with greater degree of

learning by teaching presumably because the extent to teach another entity becomes greater under this given condition. Also, I find that similarity in skillsets among current affiliates of the parent firm enhances the degree of learning by teaching due to the fact that related knowledge facilitates the diffusion process. Frequent learning chances, on the other hand, that come from frequent integration activities reduce the amount of errors and ultimately dampen the effect of learning by teaching. Time compression diseconomies to the opportunity of learning by teaching appears as it takes time to accumulate errors once they are corrected.

Finally, in Chapter 5, I extend the empirical model to test the efficacy of learning by teaching at an individual task level. I investigate the improvement in timely loan loss forecasting following an integration process, which involves a considerable amount of teaching opportunities. Again, I use a longitudinal panel data of U.S. commercial banks between the period of 1998 and 2013. This data set finds its novelty in offering a unique research setting that allows me to test the behavioral difference of firms prior to and after the 2007 – 2009 financial crisis. Results show that bank managers become timelier in recognizing loan losses and reflecting it into their current term provisioning after experiencing an integration with another bank. The findings imply that bank managers learn about inefficiencies in current processes or standards during the course of teaching another entity and change their behavior to overcome the errors. The effect that was salient for banks who acquired another bank disappears after the promotion of forward-looking provisioning by the BCBS after the financial crisis. Arguably, institutions can act as an alternative to learning by teaching by enforcing the type of learning that is expected from a teaching activity.

Based on the findings and theoretical development, this dissertation offers a number of contributions to the organizational learning and corporate strategy literature. First, this dissertation finds its novelty in identifying a critical theoretical construct associated with organizational learning which has been neglected in the strategy literature. In particular, the present dissertation recognizes the value of knowledge restoration and capability reinforcement through the process of learning by teaching. Second, the theoretical perspective of this dissertation eases the traditional theoretical premise prevalent in the learning literature that knowledge flow from the entity with greater knowledge stock to the entity with smaller knowledge stock by recognizing benefits to the firm who transfers its superior capabilities to another. The interaction of two firms not necessarily creates a learning opportunity for the entity with less knowledge but also learning benefits are granted to the entity with the source of information or technology. Third, this dissertation contributes to the evolutionary literature by expanding our understanding of dynamic capabilities and absorptive capacity. In order to achieve an understanding of the full spectrum of organizational learning, this paper highlights the role of absorptive capacity in the efficacy of learning by teaching. Because firms that accumulated experience and knowledge are built with greater level of absorptive capacity, it becomes easier for those firms to learn back lost knowledge and restore the focal knowledge at a higher efficiency. The learning by teaching mechanism highlights this broader role of absorptive capacity by shedding light on the restoration and reconfiguration of knowledge that results from a teaching activity. Finally, this dissertation provides pragmatic implications to firm managers. Although this dissertation identifies the impact of learning by teaching on different aspects of firm performance, it is important that practitioners acknowledge the

efficacy of learning by teaching and consciously realize the learning results. Boud et al (1985) emphasizes the role of consciousness that impacts the effectiveness of learning. Unconscious processes do not guarantee making active changes due to the fact that the actor is not aware of the learning that he or she encounters (Boud et al; 1985). Therefore, this dissertation alerts practitioners of the potential loss that they would suffer from by not realizing and actively seeking for improvement opportunities that can be derived from a teaching, in other words training, opportunity. In the following section, I discuss the future research directions of this dissertation.

Discussion and Future Directions

A considerable group of scholars raised the issue of construct validity issues and conceptual misunderstandings within the organizational learning literature (Argyris & Schön, 1978, 1996; Brown & Duguid, 2000; Fiol & Lyles, 1985; Gephart, Marsick, Van Buren, & Spiro, 1996; Huber, 1991; Isaacs & Senge, 1992; March & Olsen, 1976; Meyer, 1982; Miner & Mezias, 1996; Tsang, 1997; Yang, Watkins, & Marsick, 2004). In efforts to clarify the conceptual understanding of organizational learning, Tsang (1997) offers us with a good summary of the definitions of organizational learning provided in the literature. Organizational learning can be interpreted from diverse perspectives such as the cultural, cognitive, and behavioral viewpoint.

The present study follows the definition of learning suggested by Levitt and March (1988) where they state organizational learning as the following:

“...organizations are seen as learning by encoding inferences from history into

routines that guide behavior”

Here, learning is defined from the cognitive and behavioral perspective where future changes in firm behavior finds its roots from a configuration of past and current knowledge. The theoretical development of learning by teaching extends our understanding on the conceptual development of organizational learning by providing a specific mechanism to which firms reflect on past knowledge and make changes into future behaviors.

Empirically, however, several challenges remain and a more rigorous approach may be at demand. In Chapter 5, the discretion in loan loss provisioning may be inheritably biased as managers can strategically use their discretion not to report based on future-provisioning in order to appeal to stakeholders or outside investors. Although I attempt to control for opportunism using capital measures, endogeneity issues that find its roots from the unobservable motivations of bank managers still remain. In future work, I aim to develop a computational model that may address these issues.

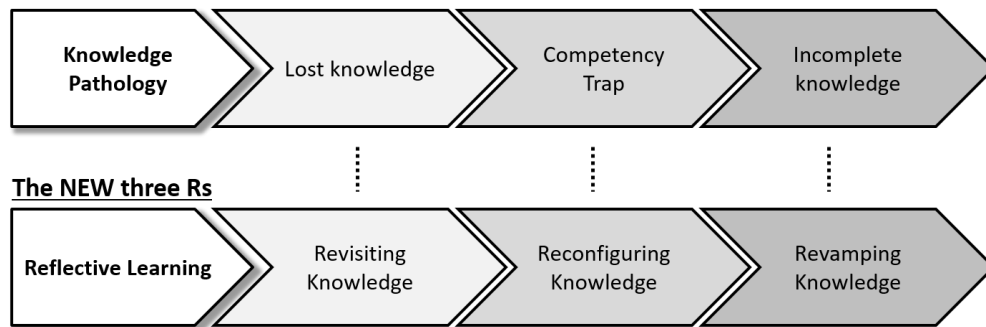
As mentioned earlier in this dissertation, the detailed mechanism of organizational learning is difficult to capture with quantitative data. Future research may explore the efficacy of learning by teaching using qualitative methods that include surveys, interviews, or text analysis in order to examine the individual mechanisms of restoration, reconfiguration, and revamping of knowledge. A survey questionnaire designed for future use is included in the Appendix section at the back of this dissertation.

Lastly, this dissertation opens up a new avenue for researchers to explore the impact of teaching in various business contexts. This dissertation limits its focus on a distinct business setting, which is the integration process between two merged firms. Teaching,

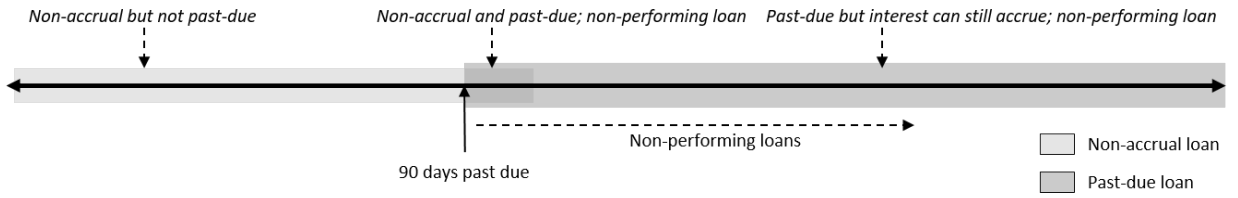
however, applies to a broader context in business. While firm managers may have unconsciously overlooked upon the act of teaching within the corporate world and neglected a significant chunk of learning in the black-box, the benefit of teaching can, in fact, be discovered in many more activities such as annual employee trainings, consulting, auditing, marketing, and evaluation processes.

Taken together, in future work, I aspire to develop a thorough theoretical perspective on the fascinating learning by teaching mechanism with greater rigor in empirical methods.

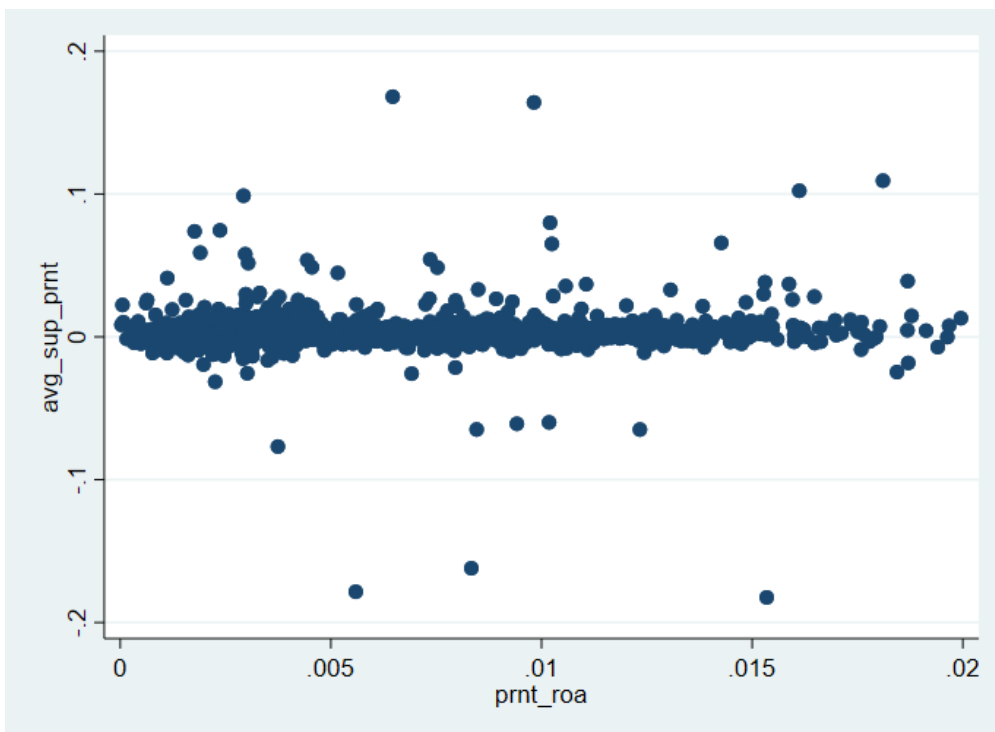
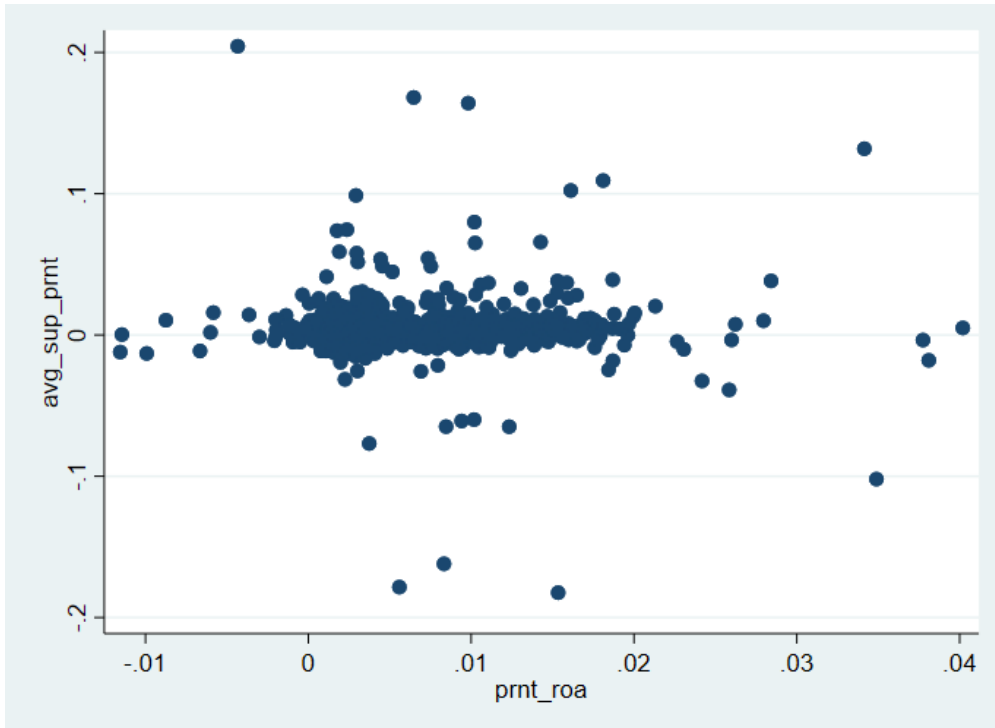
[Figure 1] The link between pathology of knowledge and mechanisms of reflective learning



[Figure 2] Decomposition of non-performing loans



[Figure 3] Scatter plot of relationship between firm performance and different choice of target firm



[Table 1] Difference between learning by doing and learning by teaching

Learning by doing	Learning by teaching
<ul style="list-style-type: none"> • Initial driver: Goal driven • Action based learning • Learning process: Unconscious acquisition of tacit knowledge <p><u>Mechanisms</u></p> <ul style="list-style-type: none"> • Acquisition of new information 	<ul style="list-style-type: none"> • Initial driver: Unintentional, process driven • Content based learning • Learning process: Conscious learning through codification of knowledge <p><u>Mechanisms</u></p> <ul style="list-style-type: none"> • Restoration of old knowledge • Reconfiguring existing knowledge • Revamping current knowledge reservoir

[Table 2] Summary statistics: Explanatory variables

Variable	Obs	Mean	Std. Dev.
Parent Superiority	2559	0.0001254	0.0066506
Parent_Target Proximity	2559	-4.425986	3.04084
Parent_Affiliate Variance	2559	0.0602675	0.1280856
Multiple Acquisition	2559	0.6273799	0.8470705
Superiority*Proximity	2559	-0.0021946	0.0416384
Superiority*Variance	2559	-0.0000474	0.0013642
Superiority*MultipleAcq	2559	-0.0001074	0.0052793

[Table 3] Summary statistics: Control variables

Variable	Obs	Mean	Std. Dev.
Total Assets	2559	3.12E+08	1.13E+09
State Herfindahl	2559	0.1220713	0.1259737
State # of Banks	2559	290.4854	171.0399
State Pincome	2559	2.81E+08	2.62E+08
# States per BHC	2559	3.321399	3.502145
# Banks per BHC	2559	10.00383	11.02937

[Table 4] Pairwise correlation of independent variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 prnt_sup_co_bhc	1														
2 proximity_bhc	-0.15	1													
3 variance_bhc	0.26	-0.13	1												
4 multiple_acq	0.13	-0.14	0.27	1											
5 prox_prntsup_co	-0.17	0.99	-0.1	-0.06	1										
6 var_prntsup_co	0.97	-0.19	0.27	0.11	-0.2	1									
7 multipleacq_prntsup_co	0.93	-0.21	0.23	0.25	-0.21	0.91	1								
8 totasset_bhc	0.56	-0.31	0.5	0.26	-0.3	0.53	0.52	1							
9 stherf_bhc	0.16	-0.03	0.17	0.06	-0.03	0.16	0.15	0.24	1						
10 stnumbhc_bhc	-0.06	0.02	-0.04	-0.03	0.02	-0.05	-0.04	-0.1	-0.38	1					
11 stpincome_bhc	0	-0.03	-0.08	-0.02	-0.03	0	-0.01	0.02	-0.04	0.31	1				
12 stnumbanks_bhc	-0.05	0.02	-0.09	-0.06	0.01	-0.05	-0.04	-0.11	-0.36	0.96	0.34	1			
13 numst_bhc	0.22	-0.1	0.56	0.39	-0.06	0.21	0.25	0.41	0.03	-0.09	-0.06	-0.15	1		
14 numbanks_bhc	0.09	-0.06	0.41	0.32	-0.03	0.09	0.13	0.17	-0.04	0.01	-0.09	-0.06	0.68	1	
15 num_poor_acq	0.23	-0.06	0.22	0.11	-0.06	0.23	0.23	0.31	0.17	-0.12	-0.05	-0.12	0.21	0.06	1

[Table 5] Fixed effects model regressions (Dependent variable: Loan quality)

	1	2	3	4	5	6	7	8
Parent Superiority		0.030*	0.030*	0.031*	0.032*	0.032	0.314***	0.387***
		(1.649)	(1.654)	(1.686)	(1.76)	(1.627)	(4.584)	(5.066)
Parent_Target Proximity			-0.003	-0.004	-0.004	0.02	0.072	0.136
			(0.196)	(0.222)	(0.218)	(0.1)	(0.359)	(0.671)
Parent_Affiliate Variance				518.931	519.646	523.409	686.165**	587.718*
				(1.625)	(1.627)	(1.631)	(2.131)	(1.808)
Multiple Acquisition					0.033	0.033	0.03	0.042
					(1.117)	(1.123)	(1.008)	(1.407)
Superiority*Proximity						-0.147	-0.566	-0.995
						(0.119)	(0.458)	(0.796)
Superiority*Variance							-4.615***	-4.314***
							(4.298)	(3.986)
Superiority*Multiple_Acq								-0.016**
								(2.153)
Total Asset	34.571***	34.571***	34.111***	29.397***	28.213***	28.291***	23.109**	22.317**
	(4.122)	(4.122)	(3.915)	(3.202)	(3.053)	(3.054)	(2.482)	(2.397)
Herf_State	938.751***	938.751***	941.840***	879.820***	877.883***	877.362***	928.797***	947.747***
	(2.937)	(2.937)	(2.943)	(2.73)	(2.725)	(2.722)	(2.89)	(2.95)
NumBHC_State	0.002	0.002	0.003	-0.084	-0.09	-0.091	0.011	0.026
	(0.004)	(0.004)	(0.004)	(0.124)	(0.134)	(0.136)	(0.017)	(0.038)
Pincome_State	0	0	0	0	0	0	0	0
	(0.376)	(0.376)	(0.371)	(0.451)	(0.357)	(0.357)	(0.364)	(0.29)
NumBanks_State	-0.112	-0.112	-0.112	-0.045	-0.024	-0.023	-0.104	-0.095
	(0.173)	(0.173)	(0.173)	(0.069)	(0.037)	(0.035)	(0.16)	(0.147)
NumState_BHC	118.261***	118.261***	118.681***	101.895***	100.353***	100.375***	99.206***	104.640***
	(3.398)	(3.398)	(3.403)	(2.802)	(2.758)	(2.758)	(2.735)	(2.88)
NumBanks_BHC	32.034***	32.034***	31.980***	30.199***	29.982***	29.987***	30.390***	30.439***
	(2.897)	(2.897)	(2.891)	(2.718)	(2.698)	(2.698)	(2.743)	(2.749)
NumPoorAcq_BHC	0	0	0	0	0	0	0	0
	(0.84)	(0.84)	(0.854)	(0.831)	(1.386)	(1.227)	(1.199)	(1.012)
Constant	0	0	0	0	0	0	0	0
	(0.183)	(0.183)	(0.186)	(0.273)	(0.549)	(0.56)	(0.726)	(0.957)
Observations	2559	2559	2559	2559	2559	2559	2559	2559

* p<0.10, ** p<0.05, *** p<0.01

[Table 6] Heckman selection model (Dependent variable: Loan quality)

	m1	m2	m3	m4
main				
Parent Superiority	0.279*** (4.534)	0.212*** (3.262)	0.366*** (4.789)	0.276*** (3.315)
Parent_Target Proximity	0.069 (1.403)	0.027 (0.696)	0.565 (0.514)	-0.364 (0.411)
Parent_Affiliate Variance	-3104.379** (2.519)	-3079.160** (2.269)	1099.699 (0.389)	1968.571 (0.645)
Multiple Acquisition	-0.093* (1.883)	-0.02 (0.483)	-0.013 (0.058)	-0.117 (0.615)
Superiority*Proximity			-3.477 (0.451)	2.732 (0.444)
Superiority*Variance			-5.277* (1.715)	-5.936* (1.836)
Superiority*MultipleAcq			-0.009 (0.445)	0.011 (0.607)
Total Asset	-29.601 (0.854)	-31.725 (0.998)	0.399 (0.011)	-22.014 (0.652)
Herf_State	4600.056*** (3.555)	2782.240* (1.857)	5004.265*** (3.821)	3053.134** (2.028)
Pincome_State	0 (0.554)	-0.001 (0.737)	0 (0.656)	-0.001 (0.841)
Numbanks_State	0.113 (0.141)	-0.296 (0.295)	0.234 (0.293)	-0.259 (0.258)
Numst_BHC	60.559 (0.483)	264.808* (1.81)	86.817 (0.686)	268.297* (1.83)
Numbanks_BHC	68.628* (1.656)	-3.011 (0.059)	55.633 (1.323)	-19.852 (0.384)
Year dummies included	yes	yes	yes	yes
nonselection hazard		-0.002* (1.835)		-0.002* (1.801)
Constant	0 (0.19)	0.003* (1.78)	-0.001 (0.359)	0.003 (1.5)
select				
tier1_annual	0.000*** (10.599)		0.000*** (10.599)	
Constant	-0.794*** -41.246		-0.794*** -41.246	
mills				
nonselection hazard	-0.001 (0.429)		0 (0.252)	
N	5579	2559	5579	2559

[Table 7] Summary statistics: Explanatory variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Δ NPLt+2	205,575	0.0005148	0.6545797	-153.6851	247.5346
Δ NPLt+3	203,353	0.0004889	0.6581559	-153.6851	247.5346
Δ NPLt+4	201,194	0.0004821	0.6617104	-153.6851	247.5346
Superior Parent Flag	1,532	0.6605744	0.473669	0	1

[Table 8] Summary statistics: Control variables

Variable	Obs	Mean	Std. Dev.	Min	Max
totasset	212,156	736860.1	1.02E+07	781	6.62E+08
stpincome	212,156	2.62E+08	2.41E+08	1.22E+07	1.27E+09
stherf	212,156	0.1196327	0.0997295	0.0114157	0.8506912
stnumbanks	212,156	336.8105	223.1089	4	843
loan proximity	212,156	0.0068617	0.0808369	0	1
nghbr dummy	212,156	0.9990646	0.0303242	0	1
# prior acq	212,156	0.0954628	1.210897	0	65
tier1cap	212,156	57815.33	689847.9	-40164	4.37E+07
boqcap	212,156	55142.59	658572.6	-563	4.19E+07

[Table 9] Pairwise correlation of independent variables

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ANPLt+2	1															
ANPLt+3	-0.5081	1														
ANPLt+4	0.1043	-0.5414	1													
Superior Parent Flag	-0.0446	-0.0359	0.0522	1												
ANPLt+2*Sup	-0.0011	0.2349	-0.1995	0.0576	1											
ANPLt+3*Sup	0.1179	-0.0007	0.1477	-0.0219	-0.5135	1										
ANPLt+4*Sup	-0.169	0.1089	0	-0.0409	0.092	-0.5003	1									
totasset	-0.0147	0.0092	0.0105	-0.0098	0.0066	0.0072	-0.0094	1								
stpincome	-0.0279	0.0029	0.0313	0.0361	0.0142	-0.002	-0.0268	0.0696	1							
stherf	-0.0429	0.0345	-0.0519	0.0331	0.0423	-0.0666	0.0567	0.1958	0.0354	1						
strumbanks	-0.0178	0.0297	0.0159	0.0318	-0.0109	0.0299	-0.0332	-0.076	0.3544	-0.3108	1					
loan proximity	0.0049	0.0137	-0.0608	0.0458	-0.0172	0.0163	-0.0046	-0.1131	0.0286	-0.0194	0.0437	1				
nghbr dummy	0.0266	-0.0236	0.0144	-0.0001	-0.0426	0.0622	-0.05	-0.3504	0.0185	-0.2144	0.1578	0.1354	1			
# prior acq	-0.0237	0.0123	0.0089	-0.0176	0.0073	0.0112	-0.016	0.2407	-0.0597	0.0534	-0.1162	0.0086	-0.3269	1		
tier1cap	-0.0394	0.008	0.0057	0.013	-0.0112	-0.028	0.0913	-0.1038	-0.022	0.05	-0.0386	-0.0821	-0.0181	-0.1033	1	
boqcap	-0.0486	-0.0383	0.0531	0.1198	-0.0145	-0.0381	0.089	-0.0619	-0.0318	0.0615	-0.0547	-0.1775	-0.0376	-0.036	0.6176	1

[Table 10] Fixed effects model regression: Prior to Basel accord

	1	2	3	4	5	6
$\Delta NPLt+2$	0.169*** 0.046	0.176*** 0.048	0.178*** 0.048	0.179*** 0.048	0.190*** 0.048	0.155*** 0.044
$\Delta NPLt+3$	0.279*** 0.041	0.303*** 0.057	0.305*** 0.057	0.286*** 0.059	0.288*** 0.059	0.186*** 0.055
$\Delta NPLt+4$		0.019 0.03	0.018 0.03	0.02 0.03	0.038 0.033	0.044 0.03
Superior Parent Flag			0.109** 0.052	0.108** 0.052	0.114** 0.052	0.107** 0.047
$\Delta NPLt+2*Sup$				0.047 0.039	0.016 0.045	0.155*** 0.043
$\Delta NPLt+3*Sup$					-0.064 0.047	0.169*** 0.049
$\Delta NPLt+4*Sup$						0.325*** 0.033
Total assets	0.268** 0.135	0.267** 0.135	0.280** 0.135	0.292** 0.135	0.289** 0.135	0.240* 0.124
stpincome	-0.176* 0.097	-0.178* 0.098	-0.176* 0.097	-0.170* 0.097	-0.166* 0.097	-0.194** 0.089
stherf	-0.429 0.442	-0.415 0.443	-0.439 0.442	-0.421 0.442	-0.428 0.442	-0.706* 0.405
stnumbanks	-81.861 111.452	-83.793 111.648	-86.251 111.268	-56.41 113.992	-51.999 113.938	-137.246 104.518
loan proximity	0.574*** 0.184	0.580*** 0.185	0.554*** 0.185	0.552*** 0.185	0.547*** 0.184	0.288* 0.171
nghbr dummy	0.161 0.099	0.158 0.099	0.157 0.099	0.15 0.099	0.159 0.099	0.129 0.09
# prior acq	0.178 0.517	0.165 0.518	0.145 0.516	0.125 0.516	0.104 0.516	0.010 0.472
tier1cap	-20.435*** 2.966	-20.485*** 2.972	-20.311*** 2.963	-20.072*** 2.968	-20.367*** 2.974	-15.561*** 2.761
boqcap	-2.737 2.029	-2.653 2.035	-2.891 2.031	-2.769 2.033	-2.857 2.032	-3.328* 1.858
Year/Quarter Dummies Included	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.183 0.153	0.102 0.077	0.025*** 0.006	0.023*** 0.006	0.023*** 0.006	0.026*** 0.006
Observations	203102	200910	1475	1475	1475	1475
R-squared	0.0006	0.0052	0.341	0.3428	0.3453	0.4539

* p<0.10, ** p<0.05, *** p<0.01

[Table 11] Subsample regression: Superior parents vs inferior parents, prior to Basel

	Superior	Inferior
ΔNPL_{t+2}	37.754*** 9.283	24.151* 14.388
ΔNPL_{t+3}	22.976** 9.359	24.689* 13.487
ΔNPL_{t+4}	46.370*** 9.62	-100.378*** 10.328
Total assets	0.319*** 0.085	-0.067 0.122
stpincome	-0.020* 0.012	-0.003 0.019
stherf	0.33 0.315	0.43 0.499
stnumbanks	-6.461 16.581	14.437 24.569
loan proximity	0.138 0.331	-0.679** 0.301
ngnbr dummy	-0.213* 0.122	-0.923*** 0.187
# prior acq	-0.790 0.483	-0.963 0.685
tier1cap	-8.298*** 1.993	-0.786 1.517
boqcap	9.173*** 1.93	8.461*** 2.202
Year/Quarter Dummies Included	Yes	Yes
Constant	0.385 0.369	1.139*** 0.394
Observations	976	499
R-squared	0.0938	0.4111

* p<0.10, ** p<0.05, *** p<0.01

[Table 12] Fixed effects model regression: Post Basel accord

	1	2	3	4	5	6
ΔNPL_{t+2}	-0.011 0.059	-0.014 0.062	-0.013 0.062	-0.025 0.064	-0.019 0.064	-0.016 0.064
ΔNPL_{t+3}	0.004 0.075	0 0.08	0.003 0.08	-0.003 0.08	-0.014 0.08	-0.014 0.08
ΔNPL_{t+4}		-0.008 0.05	-0.011 0.05	-0.015 0.05	-0.031 0.051	-0.043 0.053
Superior Parent Flag			0.113 0.09	0.109 0.09	0.101 0.09	0.09 0.091
$\Delta NPL_{t+2} * Sup$				0.048 0.057	0.064 0.058	0.061 0.058
$\Delta NPL_{t+3} * Sup$					0.124* 0.067	0.133* 0.068
$\Delta NPL_{t+4} * Sup$						0.046 0.052
Total assets	0.326*** 0.102	0.333*** 0.112	0.341*** 0.112	0.368*** 0.117	0.420*** 0.12	0.424*** 0.12
stpincome	0.049 0.116	0.048 0.117	0.059 0.117	0.056 0.117	0.064 0.116	0.063 0.117
stherf	-0.121 0.626	-0.132 0.632	-0.194 0.634	-0.239 0.636	-0.454 0.644	-0.444 0.645
stnumbanks	747.658** 325.604	753.863** 329.229	749.322** 328.928	756.946** 329.217	717.706** 328.571	685.435** 330.8
loan proximity	-0.29 0.329	-0.287 0.331	-0.293 0.331	-0.349 0.337	-0.338 0.336	-0.328 0.337
nghbr dummy	-0.171 0.152	-0.169 0.153	-0.175 0.153	-0.185 0.154	-0.192 0.153	-0.199 0.153
# prior acq	4.470** 1.770	4.480** 1.780	4.620*** 1.782	4.556** 1.785	3.917** 1.811	3.822** 1.815
tier1cap	15.887** 6.683	15.939** 6.728	17.401** 6.821	17.184** 6.829	17.216** 6.802	17.247** 6.805
boqcap	4.011 3.365	3.996 3.378	3.495 3.398	3.443 3.4	3.502 3.386	3.437 3.388
Year/Quarter Dummies Included	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-3.512*** 1.224	-3.542*** 1.241	-3.700*** 1.246	-3.629*** 1.25	-3.490*** 1.247	-3.383*** 1.254
Observations	1114	1104	1104	1104	1104	1104
R-squared	0.5339	0.5338	0.5363	0.5374	0.5426	0.5438

* p<0.10, ** p<0.05, *** p<0.01

[Table 13] Subsample regression: Superior parents vs inferior parents, Post Basel

	Superior	Inferior
ΔNPL_{t+2}	3.909 9.906	18.158 13.326
ΔNPL_{t+3}	9.354 10.363	11.262 14.906
ΔNPL_{t+4}	25.328** 10.511	24.626** 12.103
Total assets	0.076** 0.034	-0.018 0.031
stpincome	-0.001 0.01	0.007 0.012
stherf	1.270*** 0.273	0.415 0.352
stnumbanks	38.083** 19.133	-29.807 24.834
loan proximity	0.142 0.321	-0.591** 0.257
nghbr dummy	-0.614*** 0.125	-0.778*** 0.168
# prior acq	-0.179 0.435	0.321 0.644
tier1cap	-6.640*** 1.802	5.029* 3.026
boqcap	1.002 1.582	4.359** 2.011
Year/Quarter Dummies Included	Yes	Yes
Constant	0.806** 0.356	0.764* 0.399
Observations	797	307
R-squared	0.2502	0.3352
* p<0.10, ** p<0.05, *** p<0.01		

[Table 14] Differences-in-difference analysis

(Delayed Expected Loss Recognition Model: Time=1 if Post Basel II Accord, 0 otherwise; Treatment=1 if Acquisition made by Superior Parents, 0 if Acquisition made by Inferior Parents)

	1	2	3	4	5	6	7	8
ΔNPL_{t+2}	14.353* 7.89	14.569* 8.112	14.569* 8.112	34.276*** 10.05	34.387*** 10.051	61.635*** 13.175	81.944*** 14.508	94.469*** 15.832
ΔNPL_{t+3}	44.475*** 6.871	42.756*** 8.294	42.756*** 8.294	58.921*** 10.266	59.015*** 10.268	100.482*** 12.765	120.359*** 15.886	100.612*** 17.865
ΔNPL_{t+4}		-2.573 5.636	-2.573 5.636	0.656 6.329	0.767 6.331	11.343 7.58	81.818*** 10.682	100.009*** 11.562
time			2.012*** 0.198	1.806*** 0.214	1.823*** 0.215	1.862*** 0.212	1.860*** 0.203	1.884*** 0.202
treat				-0.074 0.049	-0.041 0.061	-0.047 0.06	-0.035 0.057	-0.044 0.057
did					-0.087 0.098	-0.066 0.097	0.002 0.093	-0.012 0.092
$\Delta NPL_{t+2} * time$						-55.321*** 19.158	-48.476*** 18.636	-67.815*** 21.332
$\Delta NPL_{t+3} * time$						-107.777*** 18.512	-97.840*** 18.74	-59.982*** 23.343
$\Delta NPL_{t+4} * time$						-0.892 14.136	-41.204*** 14.282	-80.447*** 17.181
$\Delta NPL_{t+2} * treat$							-78.869*** 18.447	-107.626*** 24.998
$\Delta NPL_{t+3} * treat$							-98.801*** 18.242	-82.900*** 24.114
$\Delta NPL_{t+4} * treat$							-131.049*** 13.332	-154.425*** 15.973
$\Delta NPL_{t+2} * did$								42.493 38.428
$\Delta NPL_{t+3} * did$								-56.705 36.628
$\Delta NPL_{t+4} * did$								100.370*** 30.584

Total assets	0.070** 0.032	0.072** 0.033	0.072** 0.033	0.055 0.038	0.056 0.038	0.084** 0.039	0.092** 0.037	0.092** 0.038
stpincome	-0.001 0.026	-0.002 0.027	-0.002 0.027	0.005 0.03	0.006 0.03	0.002 0.03	-0.006 0.028	-0.013 0.028
stherf	0.328 0.271	0.329 0.274	0.329 0.274	0.539* 0.316	0.530* 0.316	0.520* 0.311	0.474 0.297	0.479 0.294
stnumbanks	138.869** 68.472	141.865** 68.9	141.865** 68.9	136.191 85.547	140.897 85.722	147.792* 84.576	157.273* 81.363	164.540** 80.774
loan proximity	-0.015 0.052	-0.013 0.052	-0.013 0.052	0.387** 0.172	0.388** 0.172	0.301* 0.17	0.109 0.163	0.06 0.162
nghbr dummy	-0.079 0.07	-0.074 0.07	-0.074 0.07	-0.034 0.089	-0.035 0.089	-0.068 0.087	-0.107 0.084	-0.091 0.083
# prior acq	0.361 0.397	0.353 0.399	0.353 0.399	0.013 0.481	0.005 0.481	0.174 0.474	-0.077 0.454	-0.048 0.450
tier1cap	0.79 1.779	0.851 1.804	0.851 1.804	3.875 2.387	3.922 2.388	2.956 2.359	3.803* 2.256	3.398 2.255
boqcap	0.304 1.088	0.279 1.094	0.279 1.094	-2.16 1.548	-2.21 1.549	-1.816 1.524	-1.546 1.458	-1.486 1.444
Year/Quarter Dummies Included	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	-0.058 0.297	-0.074 0.3	-0.074 0.3	-0.619 0.412	-0.644 0.413	-0.488 0.408	-0.387 0.39	-0.334 0.387
Observations	3320	3283	3283	2579	2579	2579	2579	2579
R-squared	0.3021	0.2997	0.2997	0.325	0.3255	0.3507	0.4091	0.4232

* p<0.10, ** p<0.05, *** p<0.01

[Table 15] Subsample regression: Superior banks vs inferior banks, Prior to Basel
(Delayed Expected Loss Recognition Model, using mean=0.0066)

	Superior	Inferior
ΔNPL_{t+2}	-33.421*** 0.441	21.932*** 3.821
ΔNPL_{t+3}	-56.937*** 1.506	13.744*** 3.846
ΔNPL_{t+4}	-166.922*** 1.459	-0.009 0.362
Total assets	-0.277 1.783	-1.173 2.866
stpincome	-0.164* 0.091	-0.339*** 0.125
stherf	5.528*** 1.931	-0.41 2.858
stnumbanks	-444.769*** 98.465	101.093 135.826
loan proximity	-0.819 2.275	0.009 3.603
nghbr dummy	0.05 5.865	-1.408 10.469
# prior acq	-6.93 13.95	5.55 27.59
tier1cap	26.903*** 6.86	10.368 22.931
boqcap	-14.384*** 5.286	-9.301 22.399
Year/Quarter Dummies Included	Yes	Yes
Constant	0.099 5.92	2.343 10.521
Observations	89672	111238
R-squared	0.1524	0.0005

* p<0.10, ** p<0.05, *** p<0.01

[Table 16] Subsample regression2: Superior banks vs inferior banks, Prior to Basel
(Delayed Expected Loss Recognition Model, using median=0.0059)

	Superior	Inferior
ΔNPL_{t+2}	-32.878*** 0.419	20.445*** 4.017
ΔNPL_{t+3}	-54.194*** 1.43	10.293** 4.048
ΔNPL_{t+4}	-164.126*** 1.386	-0.06 0.38
Total assets	-0.211 1.563	-1.507 3.321
stpincome	-0.157* 0.081	-0.364*** 0.137
stherf	5.141*** 1.741	-0.588 3.155
stnumbanks	-406.265*** 88.358	118.647 149.617
loan proximity	-0.741 2.031	0.016 4.057
nghbr dummy	0.073 5.396	-1.535 11.481
# prior acq	-63197.131 124346.41	72940.69 325517.709
tier1cap	27.344*** 6.423	10.655 24.561
boqcap	-14.358*** 5.015	-9.852 23.991
Year/Quarter Dummies Included		
Constant	-0.069 5.445	2.567 11.539
Observations	100346	100564
R-squared	0.148	0.0005

* p<0.10, ** p<0.05, *** p<0.01

APPENDIX

The Basel II Accord

The Basel II Accord first introduces the concept of forward-looking provisioning in its guidelines to protect banks from bank failure. To provide the reader with detailed information of the Basel II Accord, I attached below direct quotes from the document.

Directly from the Basel II Accord (Kane, 2007):

“Detailed criteria 669. This section describes a series of quantitative standards that will apply to internally generated operational risk measures for purposes of calculating the regulatory minimum capital charge. (a) Any internal operational risk measurement system must be consistent with the scope of operational risk defined by the Committee in paragraph 644 and the loss event types defined in Annex 9. (b) Supervisors will require the bank to calculate its regulatory capital requirement as the sum of expected loss (EL) and unexpected loss (UL), unless the bank can demonstrate that it is adequately capturing EL in its internal business practices. That is, to base the minimum regulatory capital requirement on UL alone, the bank must be able to demonstrate to the satisfaction of its national supervisor that it has measured and accounted for its EL exposure. (c) A bank’s risk measurement system must be sufficiently ‘granular’ to capture the major drivers of

operational risk affecting the shape of the tail of the loss estimates. 148 (d) Risk measures for different operational risk estimates must be added for purposes of calculating the regulatory minimum capital requirement. However, the bank may be permitted to use internally determined correlations in operational risk losses across individual operational risk estimates, provided it can demonstrate to the satisfaction of the national supervisor that its systems for determining correlations are sound, implemented with integrity, and take into account the uncertainty surrounding any such correlation estimates (particularly in periods of stress). The bank must validate its correlation assumptions using appropriate quantitative and qualitative techniques. (e) Any operational risk measurement system must have certain key features to meet the supervisory soundness standard set out in this section. These elements must include the use of internal data, relevant external data, scenario analysis and factors reflecting the business environment and internal control systems. (f) A bank needs to have a credible, transparent, well-documented and verifiable approach for weighting these fundamental elements in its overall operational risk measurement system. For example, there may be cases where estimates of the 99.9th percentile confidence interval based primarily on internal and external loss event data would be unreliable for business lines with a heavy-tailed loss distribution and a small number of observed losses. In such cases, scenario analysis, and business environment and control factors, may play a more dominant role in the risk measurement system. Conversely, operational loss event data may play a more dominant role in the risk measurement system for business lines where estimates of the 99.9th percentile confidence interval based primarily on such data are deemed reliable. In all cases, the bank's approach for weighting the four fundamental

elements should be internally consistent and avoid the double counting of qualitative assessments or risk mitigants already recognized in other elements of the framework”.

Survey design for future qualitative studies

Questionnaire

- Has the organization that you work at involved in mergers and acquisitions during your term of office?
 - Yes
 - If yes, how many times? ____
 - No
- At what level of institution did you work for?
 - Branch level at the acquiring firm
 - Regional office level at the acquiring firm
 - Corporate parent level at the acquiring firm
 - Branch level at the target firm
 - Regional office level at the target firm
 - Corporate parent level at the target firm
- What is your role at your bank?
- On average, how many training materials did you use for each training that entails an acquisition?
 - On average, how many *new* training materials did you produce for each training that entails an acquisition?

- On average, how many *old* training materials were updated for each training that entails an acquisition?
- On average, how many functional leaders are involved in a single training program that entails an acquisition?
- On average, how many functional divisions are involved in a single training program that entails an acquisition?
- On the scale of 1-10 how much new knowledge do you think you got access to during the preparation stage of the training program?
- On the scale of 1-10 how much do you think you revisited old knowledge during the preparation stage of the training program?
- On average, how many functional leaders engaged in the actual transfer of knowledge?
- On average, how many hours did you spend a week prior to the training program?
- On average, how many days did you work prior to the training program?
- On average, how many hours did you spend a week on the training program?
- On average, how many days did you work on the training program?
- On the scale of 1-10 how much discretion do loan managers have in loan risk management?
- On the scale of 1-10 to what extent do the functional managers involved in training have the opportunity to communicate report the outcome to the corporate level?
- On the scale of 1-10 to what extent do you think your institution learns from teaching the acquired banks?

BIBLIOGRAPHY

- Agarwal, P.K., Karpicke, J.D., Kang, S.H., Roediger, H.L. and McDermott, K.B.
2008 "Examining the testing effect with open-and closed-book tests". *Applied cognitive psychology*, 22(7), pp.861-876.
- Ahmed, A.S., Takeda, C. and Thomas, S.
1999 "Bank loan loss provisions: a reexamination of capital management, earnings management and signaling effects". *Journal of Accounting and Economics*, 28(1), pp.1-25.
- Ahuja, G. and Katila, R.
2001 "Technological acquisitions and the innovation performance of acquiring firms: A longitudinal study". *Strategic management journal*, 22(3), pp.197-220.
- Allen, V.L. and Feldman, R.S.
1973 "Learning through tutoring: Low-achieving children as tutors". *The Journal of Experimental Education*, 42(1), pp.1-5.
- Allen, V.L. and Feldman, R.S.
1976 "Studies on the role of tutor. Children as teachers: Theory and research on tutoring". pp.113-129.
- Amel, D.
1993 "State laws affecting the geographic expansion of commercial banks". Manuscript, Board of Governors of the Federal Reserve System.
- Argote, L.
1990 "Organizational learning: Creating, retaining and transferring knowledge". Springer.
- Argyris, C.
1977 "Organizational learning and management information System's. *Accounting, Organizations and Society*, 2(2), pp.113-123.
- Argyris, C. and Schon, D.
1978 "Organizational learning: A theory of action approach". Reading, MA: Addison

Wesley.

Argyris, C. and Schön, D.A.

1996 "Organizational learning: A theory of action perspective". *Reis*, (77/78), pp.345-348.

Arnsten, A.F.

2009 "Stress signalling pathways that impair prefrontal cortex structure and Function". *Nature Reviews Neuroscience*, 10(6), p.410.

Bargh, J.A. and Schul, Y.

1980 "On the cognitive benefits of teaching". *Journal of Educational Psychology*, 72(5), p.593.

Barr, M.S. and Miller, G.P.

2006 "Global administrative law: the view from Basel". *European Journal of International Law*, 17(1), pp.15-46.

Barney, J.B.

1986 "Strategic factor markets: Expectations, luck, and business strategy". *Management science*, 32(10), pp.1231-1241.

Beatty, A. and Liao, S.

2011 "Do delays in expected loss recognition affect banks' willingness to lend?". *Journal of Accounting and Economics*, 52(1), pp.1-20.

Benware, C.A. and Deci, E.L.

1984 "Quality of learning with an active versus passive motivational set". *American Educational Research Journal*, 21(4), pp.755-765.

Bhagat, R.S., B.L. Keida, P.D. Harveston and H.C. Triandis

2002 "Cultural variations in the cross-border transfer of organizational knowledge: an integrated framework". *Academy of Management Review*, 27(2), 204-21.

Boud, D., Keogh, R. and Walker, D.

1985 "Promoting reflection in learning: A model. Reflection: Turning experience into Learning". pp.18-40.

Bradley, M., Desai, A. and Kim, E.H.

1983 "The rationale behind interfirm tender offers: Information or synergy?". *Journal of financial economics*, 11(1-4), pp.183-206.

Bransford, J.D., Nitsch, K.E. and Franks, J.J.

1977 "Schooling and the facilitation of knowing". *Schooling and the acquisition of Knowledge* pp.31-55.

- Brown, J. and Duguid, P.
2000 "Organizational learning and communities of practice: Toward a unified view of working, learning, and innovation". In Knowledge and communities (pp. 99-121).
- Burt, R.S.
2002 "The social capital of structural holes". The new economic sociology: Developments in an emerging field, pp.148-190.
- Bushman, R.M. and Smith, A.J.
2001 "Financial accounting information and corporate governance". Journal of accounting and Economics, 32(1-3), pp.237-333.
- Bushman, R.M. and Williams, C.D.
2012 "Accounting discretion, loan loss provisioning, and discipline of banks' risk taking". Journal of Accounting and Economics, 54(1), pp.1-18.
- Bushman, R.M. and Williams, C.D.
2015 "Delayed expected loss recognition and the risk profile of banks". Journal of Accounting Research, 53(3), pp.511-553.
- Butler, A.C. and Roediger III, H.L.
2007 "Testing improves long-term retention in a simulated classroom setting". European Journal of Cognitive Psychology, 19(4-5), pp.514-527.
- Capon, N., Farley, J.U., Hulbert, J. and Lehmann, D.R.
1992 "Profiles of product innovators among large US manufacturers". Management Science, 38, 157-169.
- Capron, L. and Mitchell, W.
2009 "Selection capability: How capability gaps and internal social frictions affect internal and external strategic renewal". Organization Science, 20(2), pp.294-312.
- Chan, J.C. and McDermott, K.B.
2007 "The testing effect in recognition memory: a dual process account". Journal of Experimental Psychology: Learning, Memory, and Cognition, 33(2), p.431.
- Chatterjee, S., Lubatkin, M.H., Schweiger, D.M. and Weber, Y.
1992 "Cultural differences and shareholder value in related mergers: Linking equity and human capital". Strategic management journal, 13(5), pp.319-334.
- Chi, M.
2000 "Self-explaining expository texts: The dual processes of generating inferences and repairing mental models". Advances in instructional psychology, 5, pp.161-238
- Cohen, P.A., Kulik, J.A. and Kulik, C.L.C.
1982 "Educational outcomes of tutoring: A meta-analysis of findings". American

educational research journal, 19(2), pp.237-248.

Cohen, W. M., and Levinthal, D.A.

1990 "Absorptive capacity: a new perspective on learning and innovation."
Administrative Science Quarterly 128-152.

Dechow, P.M. and Skinner, D.J.

2000 "Earnings management: Reconciling the views of accounting academics,
practitioners, and regulators". Accounting horizons, 14(2), pp.235-250.

de Holan, P.M., Phillips, N. and Lawrence, T.B.

2004 "Managing organizational forgetting". MIT Sloan Management Review, 45(2),
p.45.

Demsetz, R.S. and Strahan, P.E.

1997 "Diversification, size, and risk at bank holding companies". Journal of money,
credit, and banking, pp.300-313.

Denrell, J.

2003 "Vicarious learning, undersampling of failure, and the myths of management".
Organization Science, 14(3), pp.227-243.

DeSmet, A., McGurk, M. and Schwartz, E.

2010 "Getting more from your training programs". McKinsey Quarterly, 4, pp.101-107.

Diamond, D.M., Campbell, A.M., Park, C.R., Halonen, J. and Zoladz, P.R.

2007 "The temporal dynamics model of emotional memory processing: a synthesis on the
neurobiological basis of stress-induced amnesia, flashbulb and traumatic
memories, and the Yerkes-Dodson law". Neural plasticity, 2007.

Dobrev, S.D., Kim, T.Y. and Carroll, G.R.

2003 "Shifting gears, shifting niches: Organizational inertia and change in the evolution
of the US automobile industry, 1885–1981". Organization Science, 14(3), pp.264-
282.

Eckbo, B.E.

1983 "Horizontal mergers, collusion, and stockholder wealth. Journal of financial
Economics", 11(1-4), pp.241-273.

Eisenhardt, K.M. and Martin, J.A.

2000 "Dynamic capabilities: what are they?". Strategic management journal, pp.1105-
1121.

Estrella, A., Park, S. and Peristiani, S.

2000 "Capital ratios as predictors of bank failure". Federal reserve bank of New York
economic policy review, 6(2), p.33.

- Fiol, C.M. and Lyles, M.A.
1985 "Organizational learning". *Academy of management review*, 10(4), pp.803-813.
- Fiorella, L. and Mayer, R.E.
2013 "The relative benefits of learning by teaching and teaching expectancy".
Contemporary Educational Psychology, 38(4), pp.281-288.
- Fiorella, L. and Mayer, R.E.
2014 "Role of expectations and explanations in learning by teaching". *Contemporary Educational Psychology*, 39(2), pp.75-85.
- Galbraith, J. and Winterbottom, M.
2011 "Peer-tutoring: what's in it for the tutor?". *Educational Studies*, 37(3), pp.321-332.
- Gephart, M.A., Marsick, V.J., Van Buren, M.E., Spiro, M.S. and Senge, P.
1996 "Learning organizations come alive". *Training & Development*, 50(12), pp.34-46.
- Gibson, C.B. and Birkinshaw, J.
2004 "The antecedents, consequences, and mediating role of organizational ambidexterity". *Academy of management Journal*, 47(2), pp.209-226.
- Haleblian, J., & Finkelstein, S.
1999 "The influence of organizational acquisition experience on acquisition performance: A behavioral learning perspective". *Administrative Science Quarterly*, 44(1), 29-56.
- Harrison, J.S., Hitt, M.A., Hoskisson, R.E. and Ireland, R.D.
1991 "Synergies and post-acquisition performance: Differences versus similarities in resource allocations". *Journal of management*, 17(1), pp.173-190.
- Haspeslagh, P.C. and Jemison, D.B.
1991 "Managing acquisitions: Creating value through corporate renewal (Vol. 416)".
New York: Free Press.
- Helfat, C.E., Finkelstein, S., Mitchell, W., Peteraf, M., Singh, H., Teece, D. and Winter, S.G.
2009 "Dynamic capabilities: Understanding strategic change in organizations". John Wiley & Sons.
- Helfat C.E., & Lieberman M.B.
2002 "The birth of capabilities: market entry and the importance of pre-history".
Industrial and Corporate Change, 11(4), 725-760.
- Hill, C.W., Hitt, M.A. and Hoskisson, R.E.
1992 "Cooperative versus competitive structures in related and unrelated diversified

- firms". *Organization Science*, 3(4), pp.501-521.
- Hitt, M.A. and Ireland, R.D.
1985 "Corporate distinctive competence, strategy, industry and performance". *Strategic management journal*, 6(3), pp.273-293.
- Hitt, M.A. and Ireland, R.D.
1986 "Relationships among corporate level distinctive competencies, diversification strategy, corporate structure and performance". *Journal of management studies*, 23(4), pp.401-416.
- Hoogerheide, V., Deijkers, L., Loyens, S.M., Heijltjes, A. and van Gog, T.
2016 "Gaining from explaining: Learning improves from explaining to fictitious others on video, not from writing to them". *Contemporary Educational Psychology*, 44, pp.95-106.
- Huber, G.P.
1991 "Organizational learning: The contributing processes and the literatures". *Organization science*, 2(1), pp.88-115.
- Isaacs, W. and Senge, P.
1992 "Overcoming limits to learning in computer-based learning environments". *European Journal of Operational Research*, 59(1), pp.183-196.
- Jaffe, A.B.
1986 "Technological opportunity and spillovers of R&D: evidence from firms' patents, profits and market value."
- Jones, G.R. and Hill, C.W.
1988 "Transaction cost analysis of strategy-structure choice". *Strategic management journal*, 9(2), pp.159-172.
- Kane, E.J.
2007 "Basel II: a contracting perspective". *Journal of Financial Services Research*, 32(1-2), pp.39-53.
- Kang, S.H., McDermott, K.B. and Roediger III, H.L.
2007 "Test format and corrective feedback modify the effect of testing on long-term retention". *European Journal of Cognitive Psychology*, 19(4-5), pp.528-558.
- Kaplan, S. and Henderson, R.
2005 "Inertia and incentives: Bridging organizational economics and organizational theory". *Organization Science*, 16(5), pp.509-521.
- Karpicke, J.D. and Grimaldi, P.J.
2012 "Retrieval-based learning: A perspective for enhancing meaningful learning".

Educational Psychology Review, 24(3), pp.401-418.

Katona, G.

1940 "Organizing and memorizing: studies in the psychology of learning and teaching".

Kelly, S.W., Burton, A.M., Kato, T. and Akamatsu, S.

2001 "Incidental learning of real-world regularities". *Psychological Science*, 12(1), pp.86-89.

Kim, J. Y. J., Haleblan, J. J., & Finkelstein, S.

2011 "When firms are desperate to grow via acquisition: The effect of growth patterns and acquisition experience on acquisition premiums". *Administrative Science Quarterly*, 56(1), 26-60.

Kim, J.Y.J. and Miner, A.S.

2007 "Vicarious learning from the failures and near-failures of others: Evidence from the US commercial banking industry". *Academy of Management Journal*, 50(3), pp.687-714.

Kim, T.Y., Dobrev, S.D. and Solari, L.

2003 "Festina lente: Learning and inertia among Italian automobile producers, 1896–1981". *Industrial and Corporate Change*, 12(6), pp.1279-1301.

Knott, A.M., Posen, H.E., Wu, B.

2009 "Spillover asymmetry and why it matters". *Management Science* 55(3): 373-388.

Koehn, M. and Santomero, A.M.

1980 "Regulation of bank capital and portfolio risk". *The journal of finance*, 35(5), pp.1235-1244.

Koh, A.W.L., Lee, S.C. and Lim, S.W.H.

2018 "The learning benefits of teaching: A retrieval practice hypothesis". *Applied Cognitive Psychology*.

Lang, L.H. and Stulz, R.M.

1994 "Tobin's q, corporate diversification, and firm performance". *Journal of political economy*, 102(6), pp.1248-1280.

Laszlo, E.

1996 "The Systems View of the World a Holistic Vision for Our Time". Cresskill, NJ: Hampton Press.

Lee, G. K.

2008 "Relevance of organizational capabilities and its dynamics: what to learn from entrants' product portfolios about the determinants of entry timing". *Strategic Management Journal*, 29(12), 1257-1280.

- Levinthal, D., & March, J. G.
1981 "A model of adaptive organizational search". *Journal of Economic Behavior & Organization*, 2(4), 307-333.
- Levitt, B. and March, J.G.
1988 "Organizational learning". *Annual review of sociology*, 14(1), pp.319-338.
- Lewis, K.
2003 "Measuring transactive memory systems in the field: scale development and validation". *Journal of applied psychology*, 88(4), p.587.
- Littlepage, G., Robison, W. and Reddington, K.
1997 "Effects of task experience and group experience on group performance, member ability, and recognition of expertise". *Organizational behavior and human decision processes*, 69(2), pp.133-147.
- Lockyer, J., Gondocz, S.T. and Thivierge, R.L.
2004 "Knowledge translation: the role and place of practice reflection". *Journal of Continuing Education in the Health Professions*, 24(1), pp.50-56.
- London M. and Sessa V.
2006 "Continuous learning in organizations: a living systems analysis of individual, group, and organization learning". in Francis J. Yammarino, Fred Dansereau (ed.) *Multi-Level Issues in Social Systems (Research in Multi Level Issues, Volume 5)* Emerald Group Publishing Limited, pp.123 – 172
- Lubatkin, M. and O'Neill, H.M.
1987 "Merger strategies and capital market risk". *Academy of Management Journal*, 30(4), pp.665-684.
- March, J.G. and Olsen, J.P.
1976 "Organizational Learning and the Ambiguity of the Past". *Ambiguity and choice in organizations*, 2, pp.54-68.
- March, J.G. and Olsen, J.P.
1979 "The new institutionalism: Organizational factors in political life". *American political science review*, 78(03), pp.734-749.
- Markides, C.C. and Williamson, P.J.
1994 "Related diversification, core competences and corporate performance". *Strategic Management Journal*, 15(S2), pp.149-165.
- Mathews, R.C., Buss, R.R., Stanley, W.B., Blanchard-Fields, F., Cho, J.R. and Druhan, B.
1989 "Role of implicit and explicit processes in learning from examples: A synergistic

effect". *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 15(6), p.1083.

McArthur, D., Stasz, C. and Zmuidzinas, M.

1990 "Tutoring techniques in algebra". *Cognition and Instruction*, 7(3), pp.197-244.

McDaniel, M.A., Howard, D.C. and Einstein, G.O.

2009 "The read-recite-review study strategy: Effective and portable". *Psychological Science*, 20(4), pp.516-522.

Meyer, A.D.

1982 "How ideologies supplant formal structures and shape responses to environments". *Journal of Management Studies*, 19(1), pp.45-61.

Mezirow, J.

1991 "Transformative dimensions of adult learning". Jossey-Bass, 350 Sansome Street, San Francisco, CA 94104-1310.

Mezirow, J.

1994 "Understanding transformation theory". *Adult education quarterly*, 44(4), pp.222-232.

Miner, A.S. and Mezirow, S.J.

1996 "Ugly duckling no more: Pasts and futures of organizational learning research". *Organization science*, 7(1), pp.88-99.

Montgomery, C.A.

1985 "Product-market diversification and market power". *Academy of Management Journal*, 28(4), pp.789-798.

Montgomery, C.A. and Wernerfelt, B.

1988 "Diversification, Ricardian rents, and Tobin's q". *The Rand journal of economics*, pp.623-632.

Nayyar, P.R.

1992 "On the measurement of corporate diversification strategy: Evidence from large US service firms". *Strategic Management Journal*, 13(3), pp.219-235.

Nonaka, I.

1988 "Creating organizational order out of chaos: Self-renewal in Japanese firms". *California management review*, 30(3), pp.57-73.

Pattison, J.C.

2006 "International financial cooperation and the number of adherents: The Basel committee and capital regulation". *Open economies review*, 17(4-5), pp.443-458.

- Pollock, T.G., Chen, G., Jackson, E.M. and Hambrick, D.C.
2010 "How much prestige is enough? Assessing the value of multiple types of high-status affiliates for young firms". *Journal of Business Venturing*, 25(1), pp.6-23.
- Posen, H. E., & Chen, J. S.
2013 "An Advantage of Newness: Vicarious Learning Despite Limited Absorptive Capacity". *Organization Science*, 24(6), 1701-1716.
- Posen, H., Martignoni, D. and Levinthal, D.
2012 "Does Size Matter? Parallel Search and the Efficacy of Experiential Learning".
- Ramaswamy, K.
1997 "The performance impact of strategic similarity in horizontal mergers: evidence from the US banking industry". *Academy of Management Journal*, 40(3), pp.697-715.
- Rawley, E.
2010 "Diversification, coordination costs, and organizational rigidity: evidence from microdata". *Strategic Management Journal*, 31(8), pp.873-891.
- Rolfe, G., Freshwater, D. and Jasper, M.
2001 "Critical reflection for nursing and the helping professions: A user's guide".
Basingstoke: Palgrave.
- Roozendaal, B.
2002 "Stress and memory: opposing effects of glucocorticoids on memory consolidation and memory retrieval". *Neurobiology of learning and memory*, 78(3), pp.578-595.
- Roscoe, R.D. and Chi, M.T.
2007 "Understanding tutor learning: Knowledge-building and knowledge-telling in peer tutors' explanations and questions". *Review of Educational Research*, 77(4), pp.534-574.
- Rumelt, R.P.
1974 "Strategy, structure, and economic performance".
- Rumelt, R. P.
1982 "Diversification strategy and profitability". *Strategic management journal*, 3(4), 359-369.
- Salter, M.S. and Weinhold, W.A.
1979 "Diversification through acquisition: Strategies for creating economic value". Free Pr.
- Sauro, M.D., Jorgensen, R.S. and Teal Pedlow, C.
2003 "Stress, glucocorticoids, and memory: a meta-analytic review". *Stress*, 6(4), pp.235-

245.

Schilling, M.A., Vidal, P., Ployhart, R.E. and Marangoni, A.

2003 "Learning by doing something else: Variation, relatedness, and the learning curve". *Management science*, 49(1), pp.39-56.

Schön, D.A.

2017 "The reflective practitioner: How professionals think in action". Routledge.

Shah, F., Evens, M., Michael, J. and Rovick, A.

2002 "Classifying student initiatives and tutor responses in human keyboard-to-keyboard tutoring sessions". *Discourse Processes*, 33(1), pp.23-52.

Singh, H. and Montgomery, C.A.

1987 "Corporate acquisition strategies and economic performance". *Strategic Management Journal*, 8(4), pp.377-386.

Singh, H. and Zollo, M.

1998 "The impact of knowledge codification, experience trajectories and integration strategies on the performance of corporate acquisition"s.

Starbuck, W.H.

1983 "Organizations as action generators". *American sociological review*, pp.91-102.

Teece, D.J.

1980 "Economies of scope and the scope of the enterprise". *Journal of economic behavior & organization*, 1(3), pp.223-247.

Teece, D., & Pisano, G.

1994 "The dynamic capabilities of firms: an introduction". *Industrial and corporate change*, 3(3), 537-556.

Teece, D.J., Pisano, G. and Shuen, A.

1997 "Dynamic capabilities and strategic management". *Strategic management journal*, pp.509-533.

Tsang, E.W.

1997 "Organizational learning and the learning organization: a dichotomy between descriptive and prescriptive research". *Human relations*, 50(1), pp.73-89.

Ullrich, J., Wieseke, J. and Dick, R.V.

2005 "Continuity and change in mergers and acquisitions: A social identity case study of a German industrial merger". *Journal of Management Studies*, 42(8), pp.1549-1569.

Wahlen, J.M.

- 1994 "The nature of information in commercial bank loan loss disclosures". *Accounting Review*, pp.455-478.
- Wall, L.D. and Koch, T.W.
2000 "Bank loan-loss accounting: A review of theoretical and empirical evidence". *Economic Review-Federal Reserve Bank of Atlanta*, 85(2), p.1.
- Wang, C.L. and Ahmed, P.K.
2007 "Dynamic capabilities: A review and research agenda". *International journal of management reviews*, 9(1), pp.31-51.
- Wernerfelt, B. and Montgomery, C.A.
1988 "Tobin's q and the importance of focus in firm performance". *The American Economic Review*, pp.246-250.
- Winter, S.G.
2003 "Understanding dynamic capabilities". *Strategic management journal*, 24(10), pp.991-995.
- Yang, B., Watkins, K.E. and Marsick, V.J.
2004 "The construct of the learning organization: Dimensions, measurement, and validation". *Human resource development quarterly*, 15(1), pp.31-55.
- Zaheer, A., Castañer, X. and Souder, D.
2011 "Synergy sources, autonomy, and integration in M&A". *Journal of Management*, 39(1), pp.1-28.
- Zhou, Y. M.
2011 "Synergy, coordination costs, and diversification choices". *Strategic Management Journal*, 32(6), 624-639.