Green Technology and Systematic Risk Management: Implications of why banks should dance with Schumpeter in times of crisis

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Abstract: The article illustrates how banks can achieve a competitive advantage by focusing on tacit knowledge in a marketing context. By using conceptual contribution from marketing theory, technology theory and knowledge management, the article illustrates that tacit knowledge can be used as agency when introducing radical innovations. Banks focusing on radical innovations can benefit from using untraditional approaches found in the business literature. The tailor making of services in banking may have positive effects on economic performance. Tacit knowledge can be used to a greater extent when tailor making services in the bank industry. By using untraditional contributions from the business literature, the article illustrates how radical innovations may be an avenue to follow for banks.

Keywords: Banking, competition, marketing theory, technology theory, knowledge management.

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From sunshine to sunset in the financial community?

The economic shock of 2008, and the Great Recession that followed, created uncertainty of the direction of the global economy. Leading economics entered into a stage of flux, leading to a reduced confidence in the banking industry. The bankruptcy of major banks in Europe and the USA may be a sign that firms and private persons will face harder times.

September 2008 marked a watershed in international affairs. The bankruptcy of Bear Sterns and Lehman Brothers triggered a recession that continues to this day and that exposed the fact that many banks did not have sufficient capital to cover the potential losses on the risks they has assumed, with the result that a lack of liquidity translated into a sovereign banking problem. Faced with this situation, governments began to take measures to clean up banking. These measures ranged from nationalization in the United Kingdom and an EU rescue plan for Ireland, financial aid in the United States, in particular in the case of semi-public mortgage providers Fannie Mae and Freddie Mac, and state cash injections to German savings banks such as Commerzbank and Hypo Real Estate, which was also the case with Dexia in France and INC in the Netherlands.

Traditional banking is in a stage of saturation. The industry needs new ways of approaching clients as change may be a constant state in the new economic landscape (i.e. Brown and Eisenhardt, 1998). For example, the digital revolution is altering the fundamental ways banks conduct business. Such significant changes challenge existing business models. There are opportunities in this uncertainly as entrepreneurship can be used as a tool when identifying and exploiting business opportunities (Ireland et al., 2001; Zahra and Dess, 2001).

The framework governing the norms that banks must adhere to regarding their own resources
is known as the Basel Accords. These are international agreements issued by the supervising committee the Bank for International Settlements based in the Swiss city of Basel. Many of these regulations were introduced before the crisis hit, However, until Basel I was introduced in 1988 no minimum levels had been set for the minimum amount of capital a bank should keep in reserve, but the start of the recession accelerated the introduction of prudential regulations.

The new Basel accord, known as Basel III, was published in December 2010. This represents a point of no return towards a new financial architecture and demands significantly more stringent standards than Basel I and Basel II. However, it will take several months to implement as it is a protracted process that requires a European Directive and the drawing up of corresponding regulations.

Anglo-Saxon countries have taken this a step further with the implementation of “ring fencing”. This draws a line between the activities of the commercial bank (based on the general public’s deposits) and the investment arm, and demands distinct requirements regarding solvency and operations for each model. Meanwhile, in 2011 and 2012 the Spanish government introduced minimum levels of “principal capital”, which is very similar to Common Equity Tier, known in the banking word as “core capital, i.e. capital, reserves and results.

A combination of the above points, along with government support and various types of bailouts totaling 1.2 billion Euros, not counting the bailout of Spanish banking in June 2012, has led to the consolidation and restructuring of banks. The time factor has been key in the implementation of all these processes, although this has to often not been appreciated by government.

Are mergers the solution? They might be in some circumstances but the problem is that banks can’t be rapidly swallowed up. Besides, there are difficult times for anyone running a bank. There is insufficient interest spread, there are limits to how much efficiency can be improved, there are regulatory limits on the assets that can be invested and their industrial participants are not going well on the stock market. Add to this pressure, much of it political, that derives from the public perception that banks have been badly managed, and it is clear that the single factor on which banks depend most, trust, is under attack.

The increase in banks’ solvency, that is their own resources, will presumably lead to a rise in the cost of credit and banking services as one’s own resources are usually more expensive than those from third parties. Banks will attempt to pass the increase on to clients or to reduce their assets, by offering less credit, in order to lower their capital necessities.

How knowledge can create value in the banking sector

Scholars explain that developing competitive advantage requires the mastering of two divergent tasks (March, 1991; Nerkar and Roberts, 2004). Firstly, banks can center their attention on sets of techniques to cultivate valuable and commercially viable products and services, often referred to as the exploitation of knowledge (March, 1991; Leonard-Barton, 1992). We are of the opinion that exploitation of knowledge is related to the traditional ways of bank operations, using existing product/market combinations as frameworks.

Secondly, banks can continually acquire diverse sets of knowledge that can serve as seeds for future competitive advantage, often referred to as the exploration of knowledge (March, 1991; Leonard-Barton, 1992). We are of the opinion that exploitation of knowledge is related to the traditional ways of bank operations, using existing product/market combinations as frameworks.

In order to describe how banks may embrace value creation processes, we distinguish between the resource-based view (RBV) and social capital theory. While the resource based view stresses the use of internally accumulated resources, social capital theory underscores its relational characteristics with external entities. RBV is related to the exploitation of knowledge (technological focus), while we are of the opinion that social capital to a greater extent is related to the exploration of knowledge (marketing focus). The two theories may be synthesized since banks can procure firm-specific knowledge, and obtain complementary resources through their external networks.
The resource based view. Exploitation of knowledge can be linked to the resource based view. This research stream suggests that internal resources may facilitate the definition of durable competitive advantages (Wernerfelt, 1984; Barney, 1986; Grant, 1996). The RBV of the firm, which builds on Schumpeter’s perspective on value creation, views the firm as a bundle of resources.

The RBV states that marshaling and uniquely combining a set of complementary and specialized resources may lead to value creation (Penrose, 1959; Wernerfelt, 1984; Barney, 1986; 1991; Amit and Schoemaker, 1993; Peteraf, 1993). The supposition it that, even in equilibrium, firms may differ in terms of the resources they control, and that such asymmetric firms may coexist, until some exogenous change or Schumpeterian shock occurs. Examples of such shocks include “radical technological innovation, social and political turmoil” (Haveman et al., 2001, p. 253).

Because they are socially complex and more difficult to understand and imitate, intangible resources are more likely to lead to a competitive advantage than is the case for tangible resources (Barney, 1991; Hitt et al., 2001). One important intangible resource is a firm’s reputation (Deephouse, 2000). Reputation can be an important strategic resource since it can give access to resources (e.g. financial capital) and that that it can help firm take advantage of information asymmetries (Hitt et al., 2001).

Which resources stand out in shaping the performance of a given firm? A strong entrepreneurial orientation captures organizational processes and methods that are important for technological performance (Covin and Slevin, 1991; Lumpkin and Dess, 1996). Entrepreneurial orientation can illustrate how organizational resources can provide sustainable competitive advantage (Lado and Wilson, 1994; Zahra et al, 1999; Knight, 1997; Lumpkin and Dess, 1996; Lee et al, 2001).

Social capital. Exploration of knowledge can be linked to social capital, as this research stream suggests that a firm’s external network is seen as a contributor to firm performance (Leenders and Gabbay, 1999). The ability to mobilize external resources, attract customers, and identify entrepreneurial opportunities can make economic transfers possible, and confer organizational legitimacy (Bunt, 1992; Uzzi, 1996; Pennings and Lee, 1999). The extent to which banks manage to acquire external knowledge from its key customers depends on the ability to recognize and make use of external resources (Cohen and Levinthal, 1990; Dyer and Singh, 1998; Gulati et al., 2000). We follow Nahapiet and Ghoshal (1998) in arguing that social capital facilitates knowledge acquisition and exploitation by effecting conditions necessary for the creation of value through the exchange and combinations of intellectual resources.

The use of knowledge creation and innovations in the banking industry

We aim to illustrate how the banking industry can become more competitive by focusing on knowledge creation and innovation. Innovation and knowledge creation result from new combinations of knowledge (Cohen and Levinthal, 1990). The accumulation of knowledge through learning constitutes a driving force for explaining firms’ growth (Penrose, 1959; Spencer and Grant, 1996). Knowledge creation and innovation have a strong and complex relationship, however, seldom examined.

Knowledge creation. While Nonaka and Takeuchi (1995) regard tacit knowledge as “as knowledge not-yet-articulated”, namely, knowledge availing for its transformation into explicit knowledge, it can be argued that such analysis is superficial in the sense that it reduces the study...
of tacit knowledge as to what can be articulated. We take a broader view on tacit knowledge as it involves much more than what can be articulated (Nonaka and Takeuchi (1995). Researchers such as Nonaka and Takeuchi (1995) have focused on how tacit knowledge can be transferred into explicit knowledge. We take the opposite approach as we believe that the use of tacit knowledge may be a strategic weapon, and that it can be a change agent in the banking industry. In order to address the question “where does knowledge come from?” it might be worthwhile to focus on learning, or to be more concrete, how different stimuli can be turned into knowledge (Moreno-Luzon and Lloria, 2007), thus avoiding a possible curtain between explicit and tacit knowledge woven by certain authors, including the contribution of Nonaka and Takeuchi (1995). Explicit and tacit knowledge are not two ends of a continuum but two sides of the same coin. Learning new capabilities can help firms to compete effectively and efficiently (Autio et al., 2000). Learning new knowledge may be necessary to help a firm to adapt to its environments. Newman (2000) argues that learning can help organizations to change. Learning is a common reason for establishing alliances and participating in strategic alliances (Gulati, 1999; Inkpen, 2000; Steensma and Lyles, 2000).

**Innovation.** In the literature innovation is linked to concepts such as tailoring, commercialization and implementation. This means that an idea that is not developed or transformed into a product, or a service, cannot be regarded as an innovation (Rogers 1983; Utterback, 1994; Afuaf 1998; Fisher 2001; Garcia and Calantone, 2002; McDermott and O’Connor, 2002).

Innovation is considered by many scholars and executives to be critical for firms to compete in turbulent business environments (Ireland and Hitt, 1999; Hitt and Ireland, 2000: Germany and Muralidharan, 2001). Hamel (2000) reports the results of a research where approximately 500 CEOs participated. The CEOs largely agreed that their industry in the last decade has changed by newcomers, not incumbents. The newcomers have often changed the rules in a given industry.

**Innovation can be grouped into six types of activities:**

- new products;
- new services;
- new methods of production;
- new sources of supply;
- new ways of organizing; and
- operating in existing and/or new markets

These variables are adapted and deducted from Schumpeter (1934, 1939, 1942, 1947,1949) and Kirzner (1976, 1985). The variables have also been used separately by a number of researchers (Utterback, 1994; Damanpour , 1996).

The types of innovations we are interested in studying more closely are technological innovations and market based innovations. Technological innovations can be regarded as links between components, methods and processes leading to new products and services (Afuah, 1998). We link technological innovations to exploitation of knowledge. Market based innovations refer to how new knowledge can be embodied in distribution channels, products, applications, and in customer needs (Afuah, 1998). We link market based innovations to exploration of knowledge.

Authors have combined technological innovations with market based innovations (Abernathy and Clark 1985; Henderson and Clark, 1990; Tushman et al. 1997). By focusing on technological innovations and market based innovations, it might be possible for banks to tailor make services to well defined market segments. By combining technological innovations with market based innovations, it might be possible to analyze what makes banks move from a situation with unclear priorities to a situation with a more clean-cut strategic orientation. This means that we are permitting careful assessments of non-linear processes. Even if we can explain, ex post, how and why a bank has moved from archetype X to archetype Y, or from position A to position B, it would not be fine-tuned enough to show how, de facto, change takes place. By emphasizing radical changes as a result of technology based and market based innovations, we believe, it might be possible to achieve competitive advantage in the banking industry.
We are of the opinion that a more radical approach than normally found in the existing literature is necessary as we regard change as a normal state for banks operating in competitive environments (Weick and Quinn, 1999). We view change as being pervasive and indivisible. We borrow James’s (1996, p. 253) apt phrase: “The essence of life is its continuously changing character”.

Change often takes place in a less-planned manner than conceptual contributions are able to describe. The use of craftwork, dating back to the early human history, laid the fundamentals for industrialization, with a focus on urbanization and economies of scale. In the years before the industrialized revolution tacit knowledge was, we believe, a source of competitive advantage. The technological developments of the eighteenth century, and particularly those of the nineteenth century, lead to more use of machines and a decline of the use of craftwork, relatively speaking. The emergence of the knowledge economy led to a renaissance of craftwork as novelty has become increasingly important as firms succeed in offering tailor-made solutions to carefully targeted market segments.

Exploitation of knowledge (technological focus) and exploration of knowledge (marketing focus) in the banking industry

Innovation is closely related to Schumpeter’s concept of entrepreneurship (Schumpeter, 1947). Schumpeter and other leading thinkers of the Austrian school regard competition as an on-going process rather than a force that sustains an economy in a state of static equilibrium. Equilibrium is not a perfected end-point since it constantly changes. The entrepreneur enters the scene because it is possible to offer better products and services in order to satisfy customer needs (Jacobsen, 1992). Based on writing of the Austrian school it is possible to link entrepreneurial processes to exploitation and exploration of knowledge.

When studying how knowledge can be created and shared, we adopt a distinction between explicit and tacit knowledge (Polanyi, 1962, 1967). Explicit knowledge is relatively easy to imitate (Nonaka and Takeuchi, 1995). Explicit knowledge is increasingly more accessible for many banks, for example on the internet and in public registers. This underlines the importance of focusing on tacit knowledge as it is mostly based on intuition, and is difficult to communicate to others as information. Tacit knowledge is vital as it can be strategic when banks try to create new knowledge (Polanyi, 1962, 1967). According to our reasoning explicit knowledge is related to exploitation of knowledge (technological focus), while tacit knowledge to a greater extent is related to exploration of knowledge (marketing focus).

Exploitation of knowledge (technological focus). We regard exploitation of knowledge as how to use technology in efficient ways. The use of technology resembles the concept of arbitration used in the financial sector. The arbitrator’s role is buying and selling the same item in different markets in order to profit from price differences. Arbitration as a concept is also applied more broadly to include trading that takes advantage of discrepancies in pricing among groups of assets that are close substitutes. This means that there is a business potential in financial dealing, using technologies as means.

Exploitation of knowledge is illustrated through market imperfections (Porter, 1980; 1985). Executives seek unexploited market positions that can lead to superior performance. A central suggestion from Porter (1985) is the five force model that illustrates how firms can achieve a greater degree of market power. Solow (1997) claims that steady state situations are convenient but are less relevant in globalized hypercompetitive business environments. This means that attempts to achieve concentration power may be short lived because competitors will use innovation and imitation strategies (Grant, 1996, p. 375).

Schumpeter (1934) viewed technological development as discontinuous change and disequilibrium resulting from innovation. He introduced the notion of “creative destruction” (Schumpeter, 1947) noting that following technological change certain rents become available to entrepreneurs, which later diminish as innovations become established practices in a given industry. These rents are called Schumpeterian rents, and are defined as rents stemming from risky initiatives and entrepreneurial insights which are subject to self-destruction as knowledge diffuses.

We may add that banks may fail when trying to achieve advantages resulting from technological innovations, as they can find themselves paralyzed by old-fashioned management practices (Leonard-Barton, 1992), and handicapped by a lack of relevant knowledge (Cohen and Levinthal, 1990). Old routines can reinforce status quo (Nelson and Winter, 1982; Gersick and
Hackman, 1990). These routines may provide a source of resistance to change, and remain an under-explained factor in the technology literature (Edmondson, 1999).

Exploration of knowledge (marketing focus). Exploration of knowledge focuses on profits stemming from innovations, and not as a result of concentration tendencies. The objective is to innovate through radical steps, and not to influence market factors, per se (Jacobsen, 1992). By using insights from marketing it is possible for banks to build relation-specific knowledge, and come in closer contact with clients through value creating processes.

During the 1990s and continuing into the 2000s, the issue of value creation for customers started to gain interest in the marketing literature. The prevailing view is that the value for customers is embedded in products that are outputs of firms’ manufacturing process. The view is called value-in-exchange. This logic is challenged by an alternative viewpoint called value-in-use, where more focus is placed on value-generating processes (Normann, 2001; Vargo and Lusch, 2004; Gronroos, 2006). According to this view, value is not created by the provider but rather by customers’ value-generating processes (Gronroos, 2000). As Vargo and Lush (2004) pointed out, this is not a new approach to value-creation. In the economics and business economics literature it has long been overshadowed by the value-in-exchange notion. In one of their original propositions of the service-dominant logic, Vargo and Lush (2004) viewed customers as co-creators but later changed this view into customers as co-creators of value (Vargo and Lush, 2008). By looking at customers as co-creators will also affect the supplier side as it can make it possible to tailor make services (Gronroos, 2006).

The classical topic of customer satisfaction/dissatisfaction is still important as it is believed that customer satisfaction has long term benefits, including customer loyalty, and increased profitability (Anderson et al., 2004; Rust et al., 2000). There is empirical research suggesting that by satisfied customers are more loyal, are involved in cross-selling and positive word-of-mouth advertising (e.g. Fornell, 1992; Fornell et al, 1996).

Such behaviors translate into superior performance as measured by traditional metrics. For example, customer satisfaction has been found to have and a positive impact on customer loyalty and usage behavior, as well as a reduction in customer complaints (Bolton, 1998; Fornell, 1992). Increased customer loyalty may increase usage levels (Bolton et al., 2000) and secure future revenues (Rust et al., 2000) as well as minimizing the likelihood of customer defection (Anderson and Sullivan, 1993; Mithas et al., 2002). Recently, a study by Anderson and Mazvancheryl (2004) found a positive association between a firm’s current level of customer satisfaction and contemporaneous financial market measures, such as stock market ratio and market-to-book ratio. Although promising, more research is needed (Gruca and Rego, 2005).

The characteristics of customers’ preferences are the antecedents to and main drivers of the response to marketers’ offers, including individually customized offers. The emerging consensus among researchers of consumer decision making is that buyers often do not have well-defined preferences that can be retrieved. They often construct their preferences when faced with the need to make decisions (for a review, see Fischhoff 1991; Slovic, 1995).

What is the relationship between innovation and knowledge creation?

We regard innovation as being dependent on knowledge creation. According to our reasoning resource based theory is related to knowledge exploitation while there is a closer link between social capital and the exploration of knowledge. While traditional banking is related to the exploitation of knowledge, newer practices in banking is to a larger extent is related to the exploration of knowledge. The exploitation of knowledge is reflected in organizational outputs. The accumulation of knowledge through learning constitutes a driving force as it enhances the ability to exploit business opportunities. Banks engage in the exploration of knowledge for the purpose of developing combinations of knowledge. Exploration involves discovery and experimentation, which can lead to increased productivity through repeated practices. In this article we suggest that banks can use tacit knowledge to a greater extent by focusing on radical marketing innovations. We believe that the exploration of tacit knowledge within new processes is the main driver for the creation of new knowledge within banks. Such a mental framework can be used as a basis for designing new marketing programs in banks, which in turn can lead to path-breaking innovations (Schumpeter, 1947; Nelson and Winter, 1982; Galinic and Rodan, 1998; Fleming, 2001; Nerkar and Roberts, 2004).

How explicit knowledge is transferred into tacit knowledge is illustrated in figure two, found at
the next page. It may be difficult to transfer explicit knowledge into tacit knowledge. The character of tacit knowledge can prevent other organizations from becoming aware of its existence, and can hamper transmissions (Miller et al., 2007). Banks can actively try to keep tacit knowledge secret as such knowledge can be a source of competitive advantage (Liebeskind, 1996). Banks can compensate some of the difficulties connected with the transfer of explicit knowledge into tacit by moving into inter organizational alliances (Grant, 1996; Liebeskind, 1996; Rosenkopf and Almeida, 2003).

Banks can compensate for some of the difficulties connected with the transfer from explicit knowledge into tacit knowledge by moving into inter organizational alliances (Grant, 1996; Liebeskind et al. 1996; Mowery and Langlois, 1996; Rosenkopf ad Almeida, 2003). An alternative is the acquisition of other banks (i.e. Capron et al, 1998; Karmin and Mitchell, 2000; Ahuja and Kastila, 2001).

Banks can benefit from using new knowledge, as existing knowledge has a tendency to become outdated, particularly in complex business environments. More than sixty years since Schumpeter’s contribution (Schumpeter, 1949), researchers are struggling to come to grips with entrepreneurship within the constraints of the conventional Newtonian paradigm. Researchers have to a certain extent attempted to apply linear approaches is studies of complex business relationships. When turbulence and disorder dominate and there is an accelerating rate of change, traditional management models will have to be used with a greater degree of care.

**Figure 2. Innovation and knowledge creation in the banking industry**

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<th>Innovation (technology and marketing)</th>
<th>Exploitation of knowledge</th>
<th>Exploration of knowledge</th>
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<td>Use of technology/explicit knowledge (the resource based view)</td>
<td>Use of marketing/tacit knowledge (social capital theory)</td>
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<td>New processes</td>
<td>Regular innovations (A)</td>
<td>Revolutionary innovations (A)</td>
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<td>Incremental innovations (B)</td>
<td>Major process innovations (B)</td>
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<td>Technological innovations (D)</td>
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<td>Existing processes</td>
<td>Niche innovations (A)</td>
<td>Radical innovations (B)</td>
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<td>Modular innovations (B)</td>
<td>Process/product and service innovations (C)</td>
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<td>Market breakthroughs (D)</td>
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Abernathy and Clark (1985)
Henderson and Clark (1990)
Tushman et al (1997)
Chandy and Tellis (1998)

**Conclusion, implications and future research**

This piece of research tries to illustrate how exploration of knowledge can be regarded as a change agent in the banking industry, when utilizing a marketing focus. Given the great degree of complexity and turbulence in the financial community, new ways of approaches seem to be needed, focusing on marketing.

A link between innovation and knowledge creation may open new research areas. Such an approach can be suited for studies of complex business practices, leading to more radical ways of organizing than traditionally found in the management literature. By combining technological innovation with market based innovations it may be possible to shed light on how banks can create new knowledge.

We suggest that entrepreneurship literature is studied to a larger extent in future writings on the financial sector as such literature often breaks with traditional business practices. We also believe that future research can benefit from using concrete business cases, more so than what has been done in this research. Studies of extreme business cases are welcome as they may give great possibilities for learning. General management theories may be of limited help...
when describing such cases as one will have to pay attention to dynamic and turbulent business environments influencing the banking industry. As the existing theories do not satisfactorily tackle grand scale turbulence, one alternative may be to step in and dance with Schumpeter.

References


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