



Toward a New Paradigm for Corporate Financial Management in the Wake of the Global Financial Crisis

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Abstract: In this paper, we discuss several phenomena from the global financial crisis that challenge the validity of the assumptions of modern finance theory and the paradigm underpinning the theory. We identify some shortcomings in the prevailing paradigm and suggest working toward a new paradigm in financial economics with recommendations. We suggest top management of companies should approach financial decision making in a more philosophical rather than a mechanical mindset.

Keywords: global financial crisis, Corporate Financial Management.

1. Introduction

In the wake of the global financial crisis, pundits point out that economic models have not been working properly since the beginning of the U.S. subprime implosion in 2007, leading to the financial meltdown in 2008. To their surprise, economic and finance scholars have been particularly silent on the implications of the financial crisis after the crisis, implying business as usual. To their own defense, many in Wall Street and in the academe have considered the 2007-8 financial crisis an aberration, a rare occurrence in the probabilistic sense in a long period of time since the 1930s [Bianchi (2008)]. The financial crisis of 2007-8 is indeed a rude awakening

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to the economic and finance profession and the disciples of the efficient markets hypothesis. Several thought provoking phenomena have emerged, calling for a careful evaluation of the validity of the assumptions of modern finance theory and a close examination of the paradigm underpinning the theory.

The first phenomenon is that some firms are too big to fail. According to the free market philosophy, firms, large or small, that do not do well will be sorted out by the market mechanism until equilibrium is restored. No firm is too large to fail. There is no need for the government to intervene because the greater the intervention, the longer it will take for the economy to reach its new equilibrium. However, many large banks, insurance companies, and industrial corporations turned out to be too big to fail during the financial crisis of 2007-8.² AIG, one of the largest insurance companies, was bailed out by the U.S. government because the Bailout Committee making the decision had close connections with the firm.³ Many U.S. big banks such as Citigroup, and Bank of America got bailed out during the financial crisis, because regulators were afraid that their collapse would shatter the global financial system [Keoun and Kuntz (2011)]. Thus, failing large corporations were bailed out during the financial crisis because of the fear for the contagion effect.

The second phenomenon is related to the first to a certain extent. Because executives from large financial institutions corporations believe in the notion of 'Too big to fail', moral hazard became so pervasive that top executives of these companies deliberately took excessive risk. Moreover, the use of executive options that rewarded the upward swing of the stock price without penalty for the risk created further reinforced the moral hazard behavior of the top executives in those companies. In particular when only the short-term (risk-free) rate of return was used to gauge performance for rewards, managers were motivated to take on more risk, leading to greater moral hazard problems and the global financial crisis [Kay (2011b)].

Third, the rapid growth of the derivatives market into a size of about \$1.2 quadrillion dwarfed the world GDP and exceeded several hundred times of the values of real assets,⁴ and the excessive use of derivatives beyond reasonable applications created concern for quite some time before the financial crisis. In addition, the huge

² For a detailed account of the epochal crisis of 2007-2008, see Sorkin (2009).

³ See "Goldman's Share of AIG Bailout Money Draws Fire," by P aritosh Bansal, <http://www.reuters.com/article/2009/03/17/us-aig-goldmansachs-analysis-idUSN1712706420090317>

⁴ DailyFinance.com, 6/9/2011.

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discrepancy between prices based on theoretical models and market prices before and during the financial crisis suggest that efficiency in the derivatives markets could have been impeded, and potential problems were doomed to emerge. The U.S. Financial Crisis Inquiry Commission (FCIC) looked into these issues in their post mortem investigation of the roles of various derivatives in the financial crisis. The FCIC (2011) attributes the major reason for the collapse of AIG to the profound failure in corporate governance, particularly the risk management practices of AIG in its credit default swaps (CDS). Failures in the supervision of AIG and its affiliates by the Office of Thrift Supervision (OTS) eventually caused the spillover of the derivatives risk to many markets across the globe. In addition, the FCIC believes that the lack of regulation and transparency of the OTC derivative markets exacerbated the crisis.

Fourth, government intervention in the name of stemming systemic risks withstands the long-time treasured, free market paradigm of classic economics. The decision to bailout failing companies, especially AIG, and the subsequent ‘quantitative easing’ (through money supply creation) policies and the ‘operation twist’ (that changes the slope of the yield curve) by the Federal Reserve have proven to be a long-term intervention effort in the once laissez faire market. The US financial markets, one of the largest capital markets in the world, are no longer free from government interventions, defying the paradigm underlying economic and finance theories.

Fifth, financial frauds exposed and Ponzi schemes as grand as the Madoff and Stanford cases uncovered during the financial crisis were shocking, implying that the ethical standards in practice were out of line with the assumptions of perfect information and efficient markets in finance theory. In addition, the connected network of insider trading (e.g., the Galleon case) by unscrupulous hedge funds is prima facie evidence of inefficient markets.

The last phenomenon is the excessive executive pay commonly based on the size of the firm but not on its financial performance. The chief executive officer (CEO) of the Standard & Poor’s (S&P) 500 index company was paid, on average, \$9.25 million in total compensation in 2009,⁵ while millions of workers lost their jobs, their homes and their retirement savings in the worst financial crisis since the Great

⁵ See Paywatch.com.

Depression. Investment banks continue to dole out huge bonuses to their executives after the financial crisis, implying business as usual.

The above phenomena observed during and after the financial crisis of 2007-8 suggest that we re-evaluate the current paradigm of the financial economic market theories and work toward a new paradigm that better describes the behaviors of participants and working of the system in the real world.

2. Premises of Economic and Financial Models

The traditional economic and finance models did not either predict the coming of the crisis or fully explain why the financial market could not sort things out on its own as theory suggests. This is because these models are based on the premises of perfect competition, efficient markets, rational behaviors, and market equilibrium. This paradigm suggests that the “invisible hand” will work its magic to resolve all imbalances and bring the economy back to the steady-state equilibrium because market participants behave rationally. As long as the markets and economy are left alone without government intervention, market forces will work their way out to resolve all problems.

Several premises can be challenged in the aftermath of the financial crisis. First, one of the predominant premises underlying financial economic models is the free-market approach to equilibrium, which is largely advocated by Milton Friedman and others. A laissez-faire paradigm assuming economic imbalances such as trade account deficits to be worked out by the ‘invisible hand’ in a competitive market environment has lost its appeal in the wake of the financial crisis. Second, the objective of the firm is to maximize shareholder’s wealth. This objective does not seem now to be consistent with reality. Corporate executives who are concerned about their yearly bonus will not be maximizing the shareholders’ wealth in the long-run. Instead, they might try to meet the short-term profit goal by laying off employees, which may create loyalty and morale problems among employees in the long-run. They might also try to keep their prices up high for as long as they can in order to enhance the bottom line. Third, the recent spate of government interventions in China during the 2007-2008 financial crisis as compared to those in developed countries seems to suggest that the Keynesian approach to managing the economy may not be

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applicable to the new reality or 'norm.' The new 'norm' poses challenges to the US corporations since government intervention has not been a critical factor in their decision making. Corporations that were used to operate under a competitive market environment and making rational decisions under the paradigm of laissez faire economics have to steer themselves carefully and conscientiously now toward the new paradigm. Proposed new bank regulations such as Basel III and regulatory reforms (e.g., the Dodd-Frank Act in the US) in the financial markets will have significant implications for management in making future business decisions as the new laws and regulations will change many practices. Moreover, regulations in the US and probably across the world will be even more stringent to ensure environmental safety and soundness, but the ebbs and flows of regulation and deregulation (especially after political party shift in power) pose a real political risk in decision making.

We use the international parity theory to illustrate that traditional economic theory has missed the mark for quite some time. The international parity theory suggests that the interest rate differential between two countries simply reflects the inflation differential between the two countries, which in turn will be reflected in the expectation of the changes in the exchange rate. In efficient markets, where there are no market impediments such as foreign exchange controls or taxes, there should be no abnormal profit from borrowing in a country with low interest rate and investing in a country where interest rate is high. This is because the inflation differential will erode the currency value of the country with high inflation rate (where the interest rate is high) in the long run. However, we have observed many persistent and profitable carry trades, which entail borrowing in a low-yield currency and investing in a high-yield currency. The persistence in carry trades challenges the international parity theory because persistent profitable opportunities should not exist in efficient markets [Zhang, Yau, and Fung (2010)]. However, we have observed significant amounts of U.S. dollar-Japanese yen carry trades since the early 1990s. This occurred until the financial crisis of 2007-8 when massive unwinding of these trades disrupted the markets. Likewise, in 2009, the unwinding of the euro-Australian dollar carry trades also sent turmoil to financial markets as they moved to a "new equilibrium."

Corporate financial theories such as the Modigliani and Miller (M&M) theorems, separation theorem of production and stockholders preferences, Capital Asset Pricing

Model (CAPM), and option pricing theory are based on restrictive, stylistic assumptions. M&M theorems on corporate financing and valuation assume a perfect market with atomistic investors with homogenous expectations about future prospects. Substantial evidence has shown that the M&M theorems cannot fully explain firm capital structure in the real world, where there are impediments in the capital market, such as information asymmetry, agency costs, bankruptcy costs, and taxes. While CAPM assumes investors to have a quadratic utility function and the stock return distribution to be normal along with a perfect market, and a home bias in investments flies right in the face of the CAPM or international CAPM. Black-Scholes-type option pricing models (OPM) assume no information flows in a steady state setting. Volatility is supposed to be assumed to be constant in the OPM, that is, volatility is constant across different strike prices. However, empirical evidence has unequivocally shown that there is a volatility smile, i.e., a U-shaped relationship between volatility and strike price level [(Hull (2000))]. Using this as an example, Triana (2009) vehemently ridicules academics who do not recognize these real world facts and still try to indoctrinate students with mathematical models that do not describe how the real world works. He laboriously demonstrates with numerous market examples how practitioners were misled by the dogmatic-defending theoreticians who eventually caused the financial crisis of 2007.

In sum, the premises used in the classical financial economic models seem not to hold up well in the wake of the financial crisis of 2007-8. In the following, we propose several premises that should be considered in the paradigm for the making of a new corporate finance theory.

3. Toward a New Paradigm

3.1 Firm's Objective: Shareholder wealth maximization

The classical economic view of a firm's objective is to maximize shareholder's wealth or strictly speaking maximizing firm value. The shareholder wealth maximization objective is based on a long-time horizon, and thus the strategy used in achieving this firm's goal is presumably based on a long-term perspective.. However, the usefulness of this paradigm of firm value-maximization has been under caution, because the necessary assumptions for this paradigm are not always met in reality as

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revealed by the meltdown of the banking and financial systems during the 2007-8 financial crisis. The necessary conditions are efficient markets, a long-term horizon, and alignment of the interests of shareholders and managers or alternatively, the absence of agency problems between shareholders and managers.

Evidence presented in the finance literature shows that financial markets are not efficient. For example, during the dotcom bubble in 2001, dotcom stocks' valuation fueled by the overreaction of investors went up so rapidly that even short-selling in the market could not prevent the crash to occur. It is puzzling that a well-functioning financial market such as the U.S. stock market may fail at times.

Deviations from the long-term objective of shareholder wealth maximization are inevitable because both the top managers (CEOs) and investors have a short-term perspective. CEOs typically have short tenure. In fact, the average CEO tenure has dropped from ten years to six since 1995 as the complexity and scale of firms have grown [Coates and Kraakman (2010)]. As their tenure gets shorter, CEOs would likely be more interested in focusing on the short-term rather than the long-term performance of the company in order to maximize their bonus, which is typically tied to the short-term performance. If a CEO misses the quarterly earnings target, stock analysts may make sell recommendation, causing the stock price to slide. Shareholders with clout may advocate for the removal of the CEO. As stock analysts exert pressure on the CEO for better firm performance, the CEO may manipulate earnings in the short run in order to meet analysts' expectations.

While CEOs have incentive to focus on the short-term performance under the current incentive structures for most companies, shareholders also tend to hold their investments for a short horizon. Since the 1970s, the average holding period for U.S. equities has come down from about seven years to seven months. Investors now with little patience are seeking for short-term financial gains as opposed to long-term growth. Fund managers investing in companies are also interested in short-term gains, because their compensation is also linked to the short-term performance of the stock. Recently it appears that investors across the globe are quite unforgiving on firms that miss earnings targets.⁶

⁶ For examples, Teck, Canada's largest base-metals and coal producer, declined 8.3 percent in February 2011 after profit fell 20 percent short of the average estimate [Bloomberg News, Feb 9, 2011], and shares of hospital software maker MedAssets Inc. in the U.S. tumbled almost 30 percent in

It remains to be seen whether this recent trend that investors focus more on the short-term earnings targets will become a long-term trend. This current market practice of using short-term earnings targets appears to sway firms' management from the long-term fundamentals. Clearly, short-term earnings guidance has unintended adverse effects on the firm's long-term strategy and its performance.

3.2 Firm's Other Objective – Sustainability

Pundits of the shareholder wealth maximization objective suggest alternative goals such as the long-term sustainability that are worthy of consideration. Modern finance theories, such as the capital structure theory and capital asset pricing model are built on a one-period static model framework. In extending a single-period analysis to a multi-period analysis in the existing financial economic models, the preference of stockholders which is critical to the production decision needs to be specified in order to define the firm profit and production function over time. That is, the financial theory of a firm in a multi-period context assumes that rational investors (stockholders) prefer more to less, and they are only interested in pecuniary gains. As a result, a firm should select projects that maximize the net present value (NPV) of the free cash flows over time with the appropriate risk-adjusted discount (market) rate or the cost of capital. If stockholders do not have the same liking of the firm's production function, they themselves can achieve their own particular preference through buying and selling in the market under the perfect market assumption.

In microeconomic theory, the optimal production occurs at a level where the marginal production cost equals the market interest rate. Such a production decision produces a win-win situation for the firm and is thus unanimously agreeable to all stockholders. The decision is not based on a particular stockholder's preference. However, if stockholders have different preferences for the firm's production, it seems clear that the prevailing production decision rule that is entirely based on financial return will be different [Fung, Yau, and Zhang (2011)].

While it seems reasonable to assume in the past that stockholders are not involved in production decisions, this assumption is no longer true. As many stockholders have become activists in corporate governance, their participation in the decision-making process affects the production function in two important ways.

February 2011 after reporting a loss for the fourth quarter and missing the Wall Street estimates [Yahoo Finance, Feb 25, 2011], just to name a few.

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First, their involvement in the executive compensation of public companies will mitigate the agency costs through proxy fights. Stockholders in many public companies including American Airlines, Citigroup, Electronic Data Systems, and JP Morgan Chase have approved proposals enabling them to be actively involved in the board decision on executive pay.⁷

Second, many stockholders have become aware of corporate social responsibility. They demand firms to consider their inputs in strategic decisions, especially in socially responsible investments [Fung, Law, and Yau (2010)]. In recent years, some mutual funds, which are major stockholders of some public companies, have been strong activists at stockholder meetings, demanding changes in firm policies regarding socially desirable firm objectives, such as green environment and social justice. Some pension and investment funds invest only in firms that have set up a formal process in evaluating socially responsible investment projects.

We suggest that firms should not only adopt the wealth maximization proposition as stockholders do, and not only evaluate this objective but also other objectives such as social justice issues. Moreover, government intervening in the market through various regulations on business practices will abate the working of the “visible hand.” Thus, in order for corporations to survive (or sustain in the long run), they no longer have a choice but to act on the policies that address new laws and regulations directed to them by the government as well as the changing preference of consumers and stockholders. In other words, considering environmental, social, and governance (ESG) or even ethical issues which are not part of any economic theory, is no longer an option but a necessity. Thus, top executives have to develop a flexible mindset that accommodates different forces which are changing and confronting them every day. Sticking mainly to one approach to solving problems and resolving issues is no longer sufficient or desirable. Corporations need to develop a flexible organization, which can respond quickly to changes in the market, regulations, and technology and which also allows its employees to be creative and act quickly. More important, developing and instilling a business culture that is apt for a changing environment and a company goal that is shared by employees, not just top managers and stockholders, are keys to long-term financial success and sustainability.

⁷ The labor market for executives is not perfectly competitive to enable us to assume away the managerial agency problem as evidenced by the excessive executive compensation throughout the financial crisis period.

3.3. Stakeholders' Objective: Relationship with Customers and Employees

The production function of a firm does not exist in a vacuum according to the standard economic model. Specifically, a firm cannot simply produce a product assuming it will be unconditionally accepted by consumers. Consumers buy a product because it meets an intrinsic need or satisfaction. The extent to which customer satisfaction of a product can be maintained over time depends on consumers' perception of the image, quality, and credibility of the product.

A firm can assure excellent product quality to customers through the development of good technology for the product and an organizational structure that ensures the high quality control of the product over time. Put another way, a corporation needs to have internally a good corporate culture for maintaining product quality and externally a corporate image perceived favorably by consumers. Infliction on corporate integrity will lower the performance of the firm and diminish the degree of sustainability. For example, in 1982, Extra-Strength Tylenol capsules in Chicago area were laced with cyanide for some reasons, causing several deaths. Johnson and Johnson immediately offered to exchange all Tylenol tablets bought by customers to ensure safety. This offer to uphold the firm's integrity cost millions of dollars to the firm but won over customers. This case demonstrates the importance of maintaining corporate integrity and promoting such good image and corporate branding, helping the firm to sustain the market share and growth. Erhard, Jensen, and Zaffron (2008) also show that a company's integrity is a necessary condition for sustaining long-term performance.

While including the customers' interest as part of the firm's production function and the firm objective seems straightforward even under the traditional paradigm, incorporating employees' interest as stakeholders of the firm requires an overhaul in the paradigm. The traditional economic theory treats employees as a factor of production and thus wages as a cost of production that stands in the way of the corporate pursuit for profit maximization. Undoubtedly employees play a pivotal role in the production function; they are not just a cog in the production machinery. They can make or break a successful firm. The decision makers of firms should pay special attention to the situation if the real wage of the workers in a firm increases along with the increase in the productivity of workers. That is, a firm is sustainable only if workers should share proportionally part of the profitability of the firm, which

does not go primarily to the people in the corner offices.

The recent spate of consecutive suicide attempts occurred at Foxconn Technology in Shenzhen, China is a good case in point⁸. Foxconn as China's largest non-government employer and the world's largest contract maker of consumer electronics for brands like Apple, Sony, Dell, Nokia, and Hewlett-Packard had been very successful financially. As the company grew, it failed to detect growing dissatisfaction with the company's wage rate and on-campus living conditions among its rank and file employees until growing employee suicide cases went public. Although the company announced plans to increase wages by 30% in the wake of suicide cases, it did not immediately respond to the crisis by dealing with its employees' demand for higher wages and improved work conditions. Management of the company simply ignored the importance of employees as stakeholders of the firm for too long. Its overarching profit-maximization motive and lack of corporate social responsibility have been called into question by the government, supply chain partners, and consumers in the aftermath of the crisis.

In incorporating employees' interest as that for stakeholders in the production and profit objectives of the firm, traditional finance theory considers the employee incentive scheme as part of their compensation package. Put another way, traditional finance theory focuses on pecuniary incentives but no other forms. It recognizes that properly drawn contracts that include pecuniary incentives may mitigate the agency costs arising from the conflict of interests between owners and managers [Jensen and Meckling (1976)]. However, traditional finance theory couched in rational economics assumes employees will rationally respond to the expected payoff as given by the incentive system. The theory presumes employees will try to maximize their utility by responding positively to greater incentives (rewards) for good performance and negatively to penalty (punishment) for poor performance. The traditional theory assumes the incentive for the good performance is as powerful as the penalty for the poor performance. This is in contrast to what we learn from behavioral economics in which many 'irrational' behaviors are observed in the financial markets, especially during the global financial crisis. Kahneman and Tversky (1979) propose the prospect theory to explain the irrational behaviors due to the asymmetric payoff of the utility function that leads people to behave differently. They suggest that people feel more

⁸ For reporting, see China Post, June 2, 2010.

pain for losing a dollar than the fun they get from gaining a dollar. This is in stark contrast to the behavior as predicted by the rational economic theory. Another example showing the irrational behavior of humans is that when a man would not pay more than \$5 for a coffee mug but would ask for more than \$5 if he could sell it.⁹ This example demonstrates that there may be different ways of motivating people. To disguise carrots (incentive) as sticks (penalty) is one way. As we witnessed from the carnage of the global financial crisis, the new paradigm for finance theory, given irrationality in human behavior, must consider the impact of the non-pecuniary (dis)incentives on employee-stakeholders.

Among the non-pecuniary motivators, employees' credibility, trust, loyalty, and relationship with the firm could be as powerful as pecuniary compensation, although their relationship with the output may not be linear as it will be with pecuniary compensation. Stakeholders' interests in the production function may contribute non-linearly to the firm profitability and its success, yet they are typically absent from the standard linear economic models. In any new paradigm, non-pecuniary motivators should be an integral part of the production and profit functions.

3.4 Corporate Governance, Fiduciary Duties, and Board Structure

The Financial Crisis Inquiry Commission (FCIC) concludes that one of the key causes of the 2007-2008 financial crisis was “the dramatic failures of corporate governance and risk management at many systematically important financial institutions” [FCIC (2011), p. xviii]. Thus, there was evidence that corporate boards of directors, particularly those of financial institutions, had failed to oversee the policies of the firm and to carry out their fiduciary duties. As a result, the SEC issued a concept release that proposed to update, for the first time in more than 30 years, the proxy system in order to increase accountability and transparency for financial institutions.¹⁰

The board of directors of a corporation with proper exercise of their fiduciary duties plays an instrumental role in corporate governance. It represents shareholders in establishing strategic policies and in ensuring of their proper execution in achieving the goals of the corporation. A board of directors that fails to perform its fiduciary

⁹ “Carrots dressed as sticks: An experiment on economic incentives,” *Economist*, 1/14/2010.

¹⁰ The SEC also recommends a uniform fiduciary standard for broker-dealers and investment advisers to ensure the integrity of investment advice provided to retail investors.

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duties could push the firm to bankruptcy. Members of the board of directors should have the industry knowledge and experience, professional expertise, as well as integrity to properly discharge their fiduciary duties. Independent board members will add a different perspective – objectivity – to the boardroom, and their omnipresence has quickly become a norm around the world.¹¹ While an increasing number of independent, non-executive, professional directors are joining many public companies, we should ensure that this is not being done at the expense of filling the slots with directors with lesser experience and knowledge about the company or the industry. The composition of the nine-person board of directors of Lehman Brothers at the time of its failure in 2008 is presented in the following table [Berman (2008)]. The collapse of Lehman Brothers and its seismic impact on the global financial system highlight the importance of the composition of the board of directors for a public company.

Name of Board member	Age	Experience
John Macomber	80	former McKinsey & Co. consultant and chief executive of Celanese Corp
John Akers	74	former IBM chief
Thomas A. Cruikshank	77	former chief executive of Halliburton Co.
Henry Kaufman	81	chief economist at Salomon Brothers (70s-80s)
Sir Christopher Gent	60	former chief of Vodafone PLC
Roger S. Berlind	75	theater producer
Roland Hernandez	50	former Telemundo chief executive
Michael Ainslie	64	former chief executive of Sotheby's Holdings
Marsha Johnson Evans	61	former head of the Red Cross and former Navy rear admiral

Source: Berman (2008)

A post-mortem analysis of the Lehman Brothers' board suggests that it may be necessary to mandate an increase in the informal time that board members spend with investors and executives. For example, the nonexecutive board members of companies owned by the private equity firms spend about 54 days a year, on average, attending to the company's business with a 70% of that time consists of informal meetings and conversations with investors and executives, which is significantly greater than that for board members of companies not owned by private equity funds

¹¹ In 2009 both the New York Stock Exchange and the NASDAQ demanded that companies should have a majority of independent directors [Economist, October 30, p.74].

[Barton (2011)].

Last, legal consequences to the board members who do not perform their fiduciary duties properly must be strictly enforced. Corporate governance should include vigilance of those who govern and reprimand of those who fail to govern. To date, the US government has not brought criminal charges against management (board of directors and the top executives) of the failed corporations that got bailout during the financial crisis. There are civil lawsuits that have been filed by shareholders and regulators against the executives of some failed corporations (e.g., Washington Mutual Inc.).¹²

3.5 Organizational Structure and Financial Strategy

Different organizational structures serve different purposes in light of the operating environment and market impediments. Different organizational structures may dictate different financial policies and strategies. For example, investment banks used to be organized as unlimited partnerships, implying that the residual risks of the firm will be borne by partners, the owners, and management. This organizational form limits risk taking if the owners are risk averse. However, when investment banks are organized as limited corporations, shareholders will be the residual claimants, not the executives. Top executives will probably take advantage of the organizational structure to protect their own financial gains by engaging in excessively risky projects. This illustrates how the structure of organization could determine the firm's strategy in the presence of agency problems. Thus, it can be argued that to a certain extent organizational structure determines strategy.¹³

Although financial strategy is an important aspect of the firm's overall strategy, finance theory does not put much emphasis on the interaction of financial strategies with overall firm strategy, let alone its interaction with the organizational structure. Often, this is left to those who study the organizational behavior. This benign neglect should not be ignored but corrected in the future by the finance profession.

Many financial policies such as dividend policy, M&A, and foreign investment should be examined carefully by itself and with the overall strategy of the firm. They

¹² In the case of Washington Mutual Inc., the wives of the CEO and the CFO were also named as defendants in a federal-court lawsuit filed by the Federal Deposit Insurance Corp. [Eaglesham and Fitzpatrick (2011)].

¹³ Many studies in the management literature focus on whether organizational structure determines strategy or vice-versa. For a review and discussion, see Chan, Fung, and Yau (2010).

cannot be evaluated purely by a standalone approach [Fung, Yau, and Zhang (2011)]. In addition, the financial strategies that deal with the various types of uncertainty should be incorporated into a decision-making framework [Courtney, Kirkland, and Viguerie (1997)].

3.6. Non-linear Thinking and Decision Making

Discussions above have shown that decisions based on financial economic models under the current paradigm are subject to biases. These models are mathematical representations of abstract theories that attempt to describe the reality as accurately as possible. In doing that, many factors, conditions, and considerations which may have impact on the reality are simply assumed away in the models to make the solutions for the models more mathematically trackable.

This axiomatic approach to formulating financial economic theory produces results which are largely descriptive in nature but not predictive. Moreover, this approach tends to mold our thinking process in a linear rational way in contrast to what our mind actually does when we make decisions.¹⁴ This approach is not inherently comprehensive or integrative across disciplines (such as marketing, management, and production) and it is not meant to help the CEO or CFO to make overall (strategic) decisions; instead they are only meant for topical economic or financial (tactical) decisions. If the assumptions of the model are found to be not true, the theory will become obsolete. We should not take the theory as granted.

The decision making process used by humans is not linear. There is ample evidence that the decision-making process is multidimensional and non-linear, although not fully understood yet [Finkelstein, Whitehead, and Campbell (2008)]. We use the issue of credibility of a company as an example. All business people are well aware that credibility is the foundation for trust between the company and the rest of the world. If the credibility of a company or its reputation is damaged or destroyed, the company cannot survive since no one wants to do business with the company because it is not trustworthy. This quintessential element of survival of the firm, however, is not incorporated but is assumed to be there (a constant) in the financial economic models. In other words, every time when a decision is made basing on the financial economic models, credibility or trust is not part of the equation. Simply put,

¹⁴ Research on decision making indicates that humans make decisions in a complex way. For details, see Finkelstein, Whitehead and Campbell (2008).

credibility or trust, the quintessential factor for the survival of the firm will not affect the outcome and hence the decision. This type of modeling approach is mind-boggling.

Besides the flaw in model assumptions, there is another adjustment we need to inculcate in the mind of decision makers who base their decisions on financial analysis under the new paradigm. It is the philosophical, rather than the mechanical adjustment to the decision making process. Under the rational expectations paradigm, corporate decision making first begins with the quantitative analysis based on financial economic models, and is then followed by the qualitative analysis including discussions and debates.¹⁵ Here is an example. Suppose a company decides whether or not to invest in a mining project. Traditional financial analysis suggests the use of the NPV (net present value) rule of capital budgeting (i.e., invest if the NPV of the project cash flows is positive). Should there be only one mine in the project for consideration, the analysis stops. The decision is clear cut based on the NPV rule. If the project considers more than one mines, the alternatives are simply compared among themselves based on each mine's NPV. The decision rule is to invest in the mine that has the greatest NPV. It is worth noting that in the case where there are alternative mines to consider, analysis does not stop right after the NPV analysis but continues to the second stage where qualitative factors will be discussed and debated.¹⁶ This is in stark contrast to the first case where there is no alternative to consider. Interestingly, finance theory (specifically the capital budgeting analysis) is mute on how to make decisions in the second and the more important stage of decision making, at which the overall strategy of the firm and how it relates to the external environment are determined.

In sum, the financial economic analysis presents the likely payoffs for alternative decision paths whereas discussions and debates among decision makers will weigh in other factors (i.e., qualitative factors) that are not included in the quantitative analysis. Following the flow in the decision process, it is clear that qualitative factors supersede quantitative factors in corporate decision making. As such, the relevance of theoretical financial models as well as quantitative financial

¹⁵ Courtney, Kirkland, and Vigueric (1997) present a four-level framework for tailoring strategy to future uncertainty. They suggest to use the quantitative analysis to identify the knowable unknowns and use their framework to deal with what they called 'residual uncertainty'.

¹⁶ For example, the SWOT analysis and Porter's five-force competitive analysis may be applied at this stage. These analyses are however static in nature.

analysis in corporate decision making is questionable and is due for change.

To address the deficiency in teaching decision making based on the rational quantitative analysis, business schools integrate different functional areas as well as incorporating behavioral economics into the teaching of rational economic analysis. Yet, this approach does not address the fundamental issue of the prevailing paradigm we have pointed out above, which is the inability to make us think in a non-linear way as we confront problems arising from a constantly changing, complex world. The fundamental flaw in the prevailing paradigm in rational economic analysis has been that problems can be pressed into a probabilistic model. However, the real world has many ‘known-unknowns’ (i.e., uncertainties that are known to exist) scenarios and ‘unknown-unknowns’ (i.e., uncertainties that are inconceivable as of now). Both types of unknowns (uncertainties) cannot be modeled in probabilistic terms [Kay (2011)]. Thus, the new paradigm for financial economic analysis should integrate a philosophical element into the high-level decision making framework, which hopefully considers the non-quantitative factors, including the unknowns in addition to quantitative (known) factors.

To illustrate how a philosophical infusion could induce innovative, nonlinear thinking into the traditional business analysis (such as the SWOT analysis and Porter’s five forces of competitive analysis) and decision making, we briefly discuss how we could use the Chinese philosophy – the Yin and Yang theory– and its premises of ‘relative position’ and ‘cyclone’ in the traditional, qualitative analysis. The Yin and Yang theory basically suggests that the analysis of all matters, be they concepts, events, relationships, etc., can be broken down to the interaction of the two natural forces, the Yin and the Yang.¹⁷ The Yin and the Yang incessantly interact with each other and each morphs into the other, creating a new ‘matter.’ To wit, these two forces will morph into a ‘known-unknown’ scenario, borrowing Kay’s (2011) terminology; when will they transform into another ‘matter’ is an ‘unknown-known.’ In other words, we know the two forces will morph into a new matter with unknown qualities, but we do not know the timing of its happening. However, with the understanding of the Yin and Yang theory, coupled with the ‘relative position’ analysis and the ‘cyclone’ dynamics, we hopefully make better judgment in ambiguous

¹⁷ The Yin and Yang theory is the bedrock for I-Ching, the oldest Chinese book written about 3,000 years ago.

situations.

‘Relative position’ analysis refers to the analysis of the situation in which, say, a company is relative to its competitors. The relative position analysis of a company identifies the strengths and weaknesses of the company relative to its competitors, which is similar to the traditional SWOT analysis. However, as the Yin and Yang theory goes, the relative position analysis does not only reflect the strengths and weaknesses of the company but also its competitor(s). Put simply, the strengths (weaknesses) of the company are the weaknesses (strengths) of the competitor(s). This is not different from the static SWOT analysis, but the SWOT analysis does not recognize the dynamic changes that may change the relative position of the company and its competitor (s), whereas the Yin and Yang theory emphasizes it. The Yin and Yang theory suggests that the dynamic interactions between the company and its competitor(s) transform the relative positions and the changing relationship and hence their strengths and weaknesses as time passes. Ignoring this in the analysis is like taking a snapshot during the shooting of a movie. As the goal of a company is to sustain its long-term survival, this type of philosophical mindset reminds executives to constantly evaluate their relative positions as well as their strategies on an on-going basis.

Another premise from the Yin and Yang theory is the notion of ‘cyclone.’ The term ‘cyclone’ is borrowed from the weather terminology to conjure up the notion of three- or multi- dimensional cycles. Paths in a two-dimensional cycle will either be up, flat, or down, whereas in a three- or multi-dimensional ‘cyclone’, paths are multi-dimensional and can move in any direction. Where they will end up is beyond our comprehension. Paths may look like the whirlwinds in a cyclone, except that paths will never be exactly the same since the time dimension is also being considered. Despite difficulty in quantifying the infinite paths a ‘cyclone’ might take, it is not difficult to realize that in reality decisions in a way may get caught in a ‘cyclone.’ In other words, we probably do not know what ultimate outcome we would get for the decision we make now, regardless of what probability the model suggests. But, we know for certainty that the actual outcome would be very different than the one we thought we would be getting at the time of making the decision. Using the cycle-‘cyclone’ analogy, decisions made in a cycle are path dependent but outcomes are still uncertain.

We use an example with Barclays Bank to illustrate a ‘cycle-cyclone’ decision path.¹⁸ When Lehman Brothers collapse in September 2008, Paul Parker, Lehman Brothers' co-head of mergers and acquisitions helped negotiate the sale of the bank's North American operations to Barclays, signaling the low point of his career cycle. In March 2011, that deal had helped put Barclays Capital, the investment banking division of Barclays, was challenging Goldman Sachs for the number one for the 2010 total mergers and acquisitions in the U.S., placing Parker to be the global head of M&A at Barclays Capital on the upside of his career cycle [McCracken (2011)]. The moral of the story is that today we may be doing well or badly, but we do not know what the outcome will hold in the future. Although Parker was forced to make the decision to sell, a ‘bad’ decision turned out an unexpectedly good outcome. It was a bad decision to him at that time because going down that path in this career cycle, the probability of having a good outcome was zero. Had he thought of his decision back then in the context of ‘cyclone’, he could have realized that as the M&A industry had to go through the different phases of the life cycle as the US financial system was collapsing, his career path might take many different turns.

In sum, we believe philosophy from different cultures has a lot to offer in the understanding of how to think nonlinearly and run a business successfully. However, there remains much work to be done as to how to weave this philosophy into the paradigm fabric of financial economic models.

4. Conclusion

There are many causes that have been identified as the culprits for the financial crisis of 2007-8. Some of the causes have common roots. For example, the implosion of the subprime mortgages attributed to the lax government regulations and failures in monitoring risk by individual financial institutions, banks, investors, and government regulators all contributed to the meltdown of the global financial markets. Corporate governance in many largest financial institutions failed, allowing them to take excessive risk in the financial markets that caused irreparable damages once imploded. More importantly, we have identified in this paper some shortcomings in the financial economic paradigm underpinning the decision making of top management of the

¹⁸ Details of the following narrative can be found in McCracken (2011).

companies involved in the crisis who were among the brightest business executives in the world.

We believe the global financial crisis calls for a new paradigm in financial economics. We suggest several concepts that should be considered when we come up with new finance or economic theories. As we all agree that the future is uncertain, we do not expect to have models that would include all possible scenarios for analysis (which is a major flaw of having blind-faith in the prevailing paradigm of financial economic models that assume uncertainty about the future can be quantified and calibrated by risk metrics). We suggest that those who are responsible for developing the financial policy and strategy should think not only ‘outside the box’ so to speak, but to think beyond what the financial economic models can infer.

Uncertainty in the relationships among the economic variables may be thought as the matters in the universe whose relationships with each other may not yet be fully known to humans. As such, we suggest management of companies should learn and approach financial decision making in a more philosophical rather than a mechanical way as taught in the business schools under the rational expectations and efficient markets paradigms. We illustrate by way of discussing the Chinese philosophical premises of ‘relative position’ and ‘cyclone’ of the Yin and Yang theory in business decision making. We suggest that top executives, working in finance or not, should allow themselves to think flexibly in a non-linear way, instead of pinning themselves down in a linear thinking path as in most rational economic models.

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