

# **ORGANIZATION CAPITAL**

**Baruch Lev**

Phillip Bardes Professor, Stern School of Business, New York University, New York, NY

**Suresh Radhakrishnan**

Constantine Konstans Distinguished Professor, Jindal School of Management, UT Dallas, TX

## INTRODUCTION

Why do some companies systematically outperform their competitors and maintain their leadership position for long periods of time – some over multiple decades – despite persistent competition and changing business landscape? The answer is organization capital – a stealth asset about which very little is known in academia and practice. Organization capital consists of business processes and systems – commitment to rules, norms and relationships – that *enable* tangible and intangible resources – such as patents, brands and human capital, which are *inert* by themselves and can be obtained by any company – to be productive. As such, Organization Capital is the *mother* of intangible assets.

Anecdotal examples of business processes and systems that enable firms to *excel* abound:

- Wal-Mart's supply chain, where the reading of barcodes of purchased products at the checkout register is directly transmitted to suppliers who are in turn responsible for inventory management and product provision to Wal-Mart stores.
- Cisco's Internet-based product installation and maintenance system, estimated by Cisco's CFO to have saved \$1.5 billion over three years (Economist, June 26, 1999).
- Zara's relationship with suppliers and process of transmitting real time customers' choices to its suppliers worldwide (Economist, June 26, 1999).
- Amazon's customer recommendation system – “item-to-item collaborative filtering” algorithm – that customizes the experience for the returning customer (Fortune, July 30, 2012).

- Netflix's algorithms that help customers choose their movies and TV shows (Wired.com, August 7, 2013).

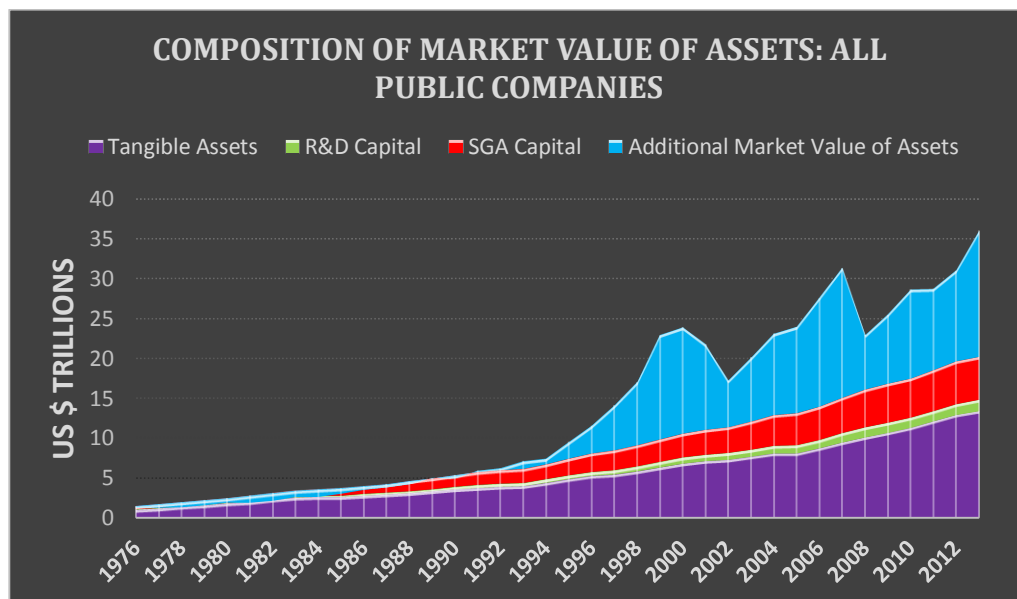
A common thread among these business processes and systems is that they are not easily mimicked by competitors – such processes and systems form part of Organization Capital.

Despite its motherhood status, Organization Capital is not captured in traditional accounting metrics. As a consequence, companies are often in a quandary about what aspects of and how much to invest in organization capital. It remains a mystery as to what investments create “appropriate” corporate culture, trust, values and relationships that form the pillars of organization capital. It follows that there is no useful guide for managers/executives/board members on measures that will help them plan and monitor the progress of this important intangible asset.

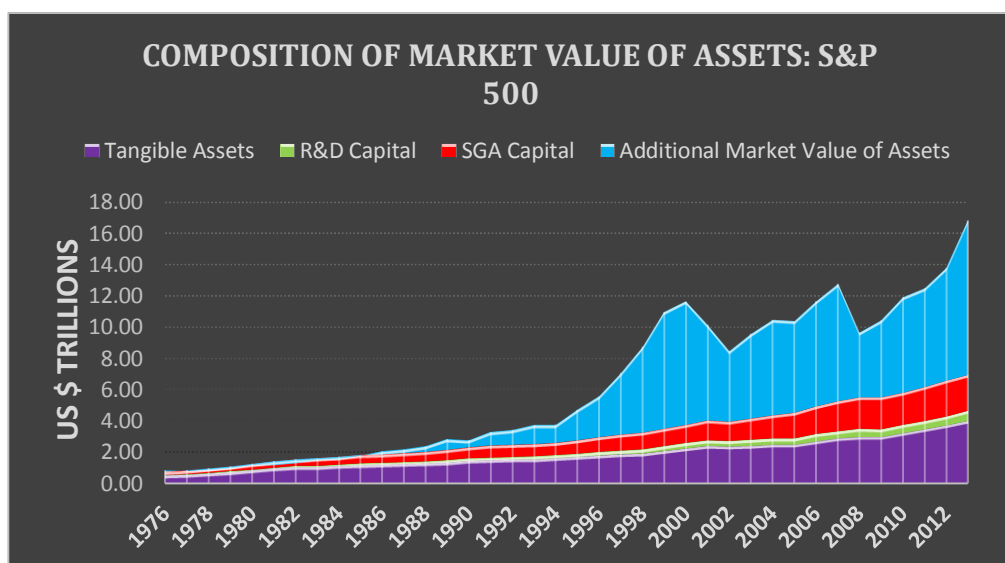
The inadequate understanding of the ingredients that make-up Organization Capital has important ramifications in the ever changing business landscape. How can managers/executives/board members make investments in organization capital so as adapt the company to new ways of doing business. Consider disruptive technologies introduced by companies such as Uber and Airbnb that build a platform of “trust” (Thomas L. Friedman, New York Times, July 19, 2014). How should Uber and Airbnb build their processes and systems so as to enable tangible assets that are not owned by them to be productive? Should it be the same way that General Electric has its business processes and systems organized? Does General Electric have to change its ways of doing business – adapt to these changing landscapes; if yes, how? Organization Capital is dynamic, and investments to create and foster it, need to evolve and change with the changing ways of doing business.

The increasing rate at which new technologies disrupt the ways business is done, makes it ever more important for companies to develop organization capital. We highlight three important trends. First, the share of economic value that is not explained by traditional inputs such as Property, Plant and Equipment (PPE), i.e., tangible assets, Research and Development (R&D) capital and Selling, General and Administration (SGA) has been increasing over time.

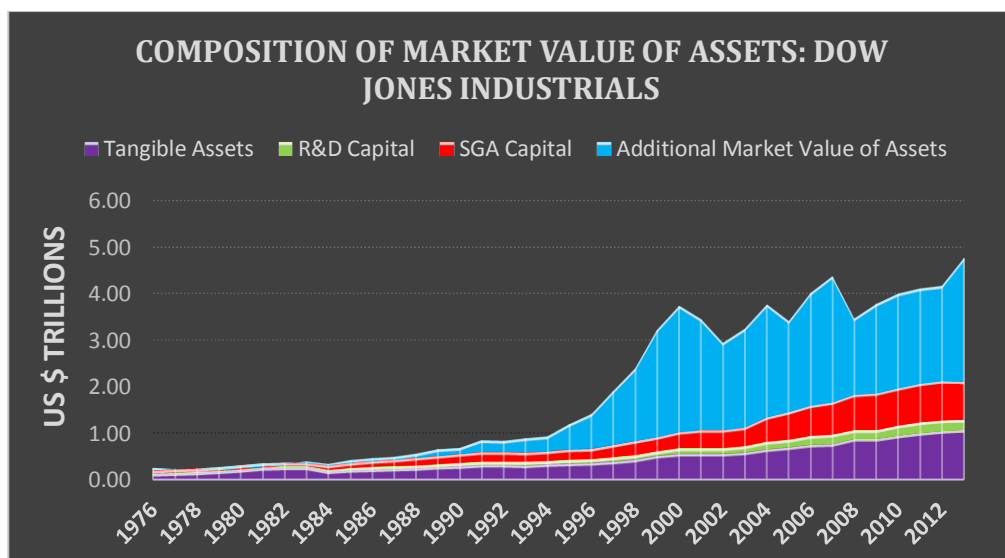
**Figure 1A**



**Figure 1B**



**Figure 1C**



Figures 1A, 1B and 1C decompose the market value of assets computed as the market value of equity plus the book value of debt for all publicly listed companies, the Standard and Poors (S&P) 500 companies and the Dow Jones Industrial companies, respectively. The blue shaded area represents the extra value of assets that is not “explained” by the traditional investments in both tangible and intangible assets; and this

unexplained portion is increasing and much larger than the tangible and the intangible investments put together.

Figures 2A provides the total investment in the U.S. as a share of the non-farm business output, and shows that intangibles have accounted for all the increase in output.

**Figure 2A**

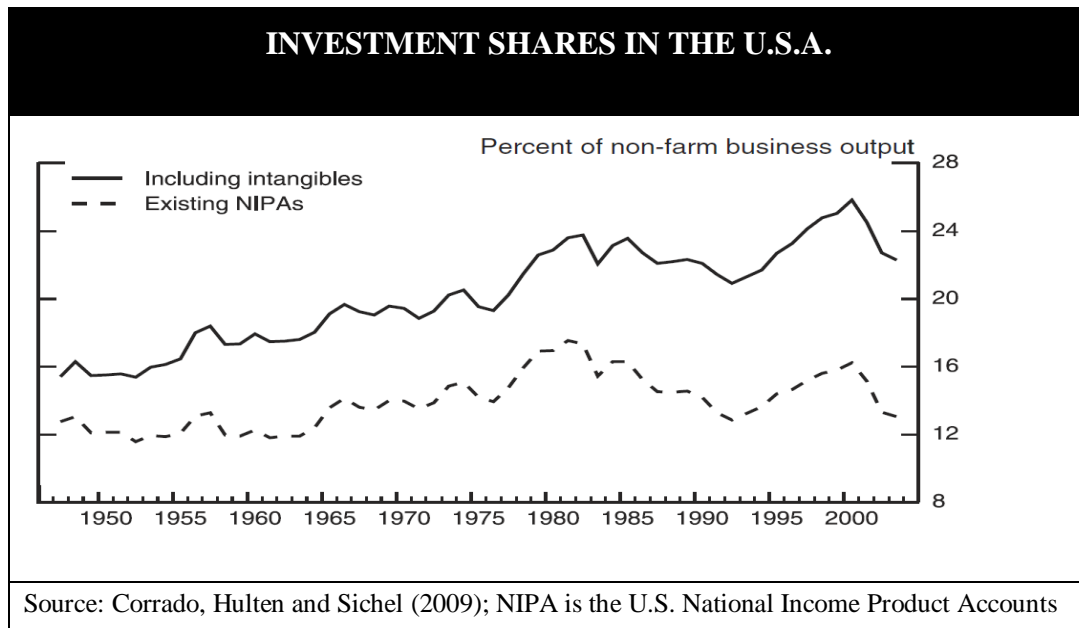
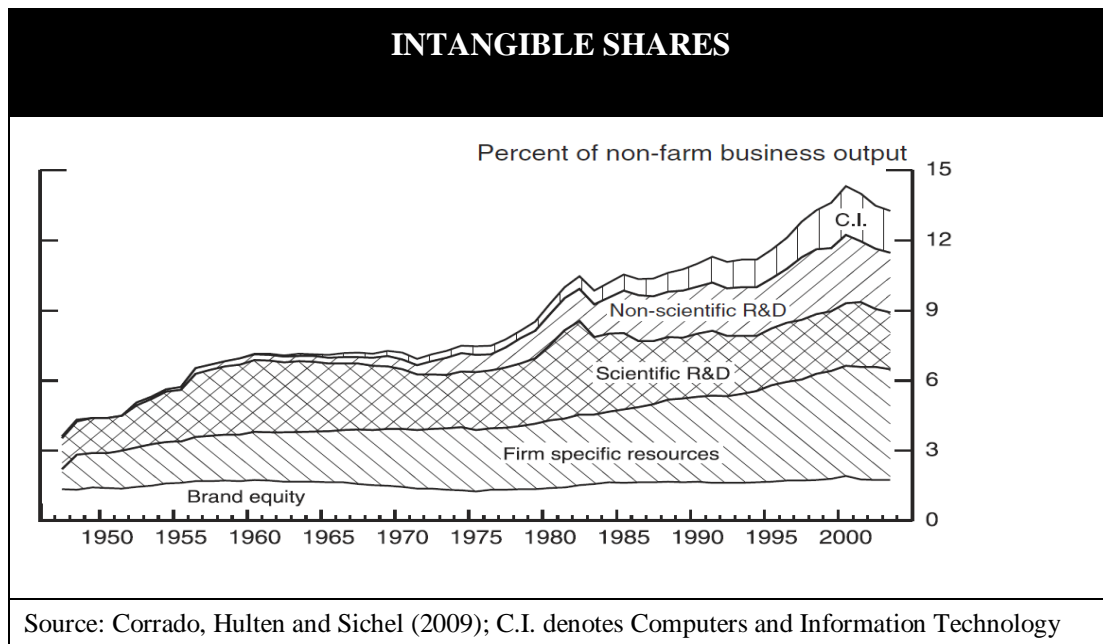


Figure 2B decomposes the intangible investments into various components and shows that the increase in intangible investments are attributable to company-specific resources, non-scientific R&D and computer software.

**Figure 2B**



Collectively, Figures 1 and 2 show that both at the country-level and for publicly listed companies, intangible investments have become more important over the years. More importantly, Figure 1 shows that the unexplained portion of asset values are increasing over time. What could this unexplained portion represent: could it be due to reduced competition and/or protectionism?

Figure 3 presents the number of companies that are publicly listed and the average number of companies in each industry.

**Figure 3**

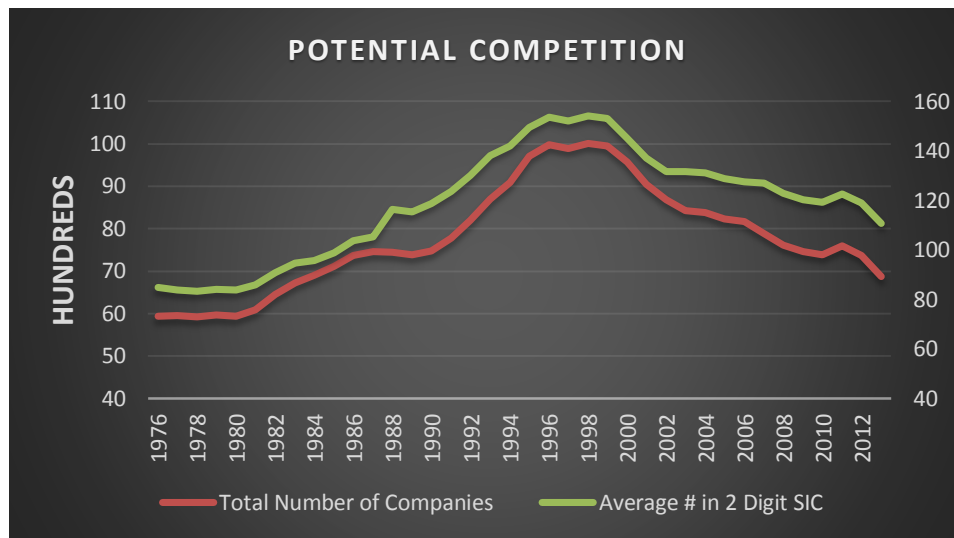


Figure 3 shows that the total number of publicly listed companies as well as the average number of companies in each industry has increased over time. Clearly, this does not suggest that the unexplained portion of the asset values by measurable tangible and intangible investments is due to lack of competition.

Figure 4 plots the global exposure of all publicly listed companies, S&P 500 and DJIA.

**Figure 4**

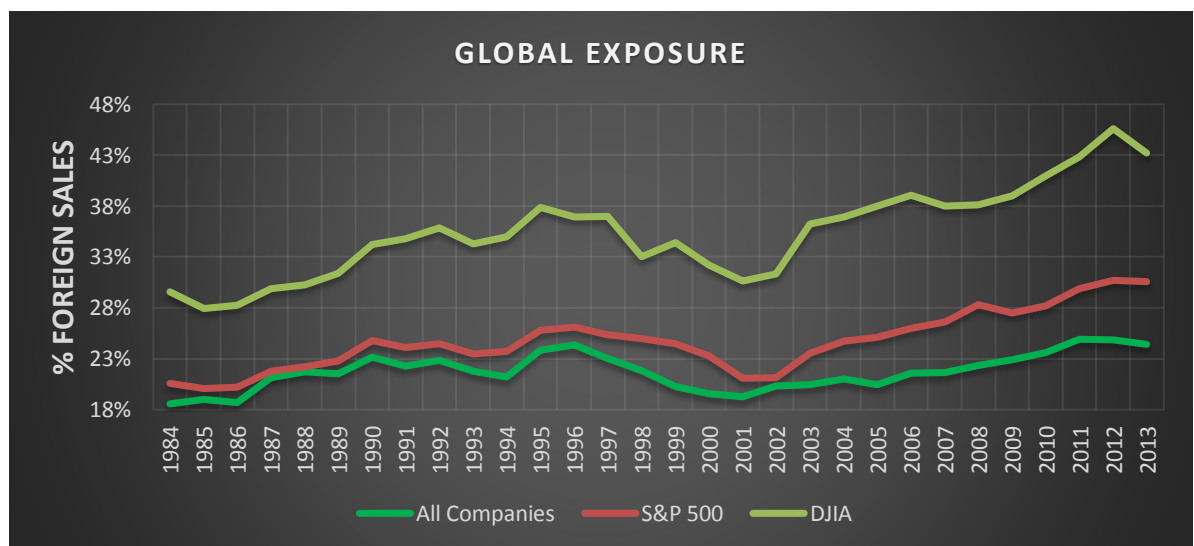




Figure 4 shows that the percentage of foreign sales that makes up the total revenues is increasing over time, indicating the increased globalization of companies.

Collectively, Figures 2 and 3 indicate that the increase in the unexplained portion of asset values is surely not because of lack of competition or protectionism at the country level. Thus, the unexplained portion of the value of assets in Figure 1 is likely due to the stealth asset – Organization Capital.

In summary, the mother of all intangible assets is becoming more important in the global and dynamic business landscape. Yet very little is known about this important asset.

#### *Why measure organization capital*

“Not everything that can be counted counts, and not everything that counts can be counted.”  
– Albert Einstein

Even though organization capital is the mother of intangible assets, i.e., it counts; it is challenging to measure. Developing a measure of organization capital will be highly useful to a multitude of decision makers. We highlight some of these below.

- Managers need to track the size and growth of organization capital—the major source of competitive advantage—and benchmark it against the past (is our organization capital deteriorating?) and against rivals.
- Valuing organization capital will enable managers to assess the return on investments in creating this resource, such as information technology (IT) and brand enhancement. Specifically, relating IT expenditures or brand enhancement outlays to changes in organizational capital will indicate the returns on these investments and guide overall resource allocation (invest less or more in IT?).

- Investors will similarly be eager to incorporate the value of organization capital in their corporate valuation models.
- In merger and acquisition cases, the value of organization capital should play a prominent role, since, such capital is predominately tacit and difficult to transfer across firms, and hence of questionable value in acquisitions.

#### *The road ahead for organization capital*

While developing a comprehensive measure of organization capital is an important first step, it is even more imperative to understand and build the links between business processes and systems to business models to organization capital. In essence, once we have a comprehensive measure of organization capital we need to open the black-box to understand what drives the measure – not only in terms of outlays and expenditures, but also qualitative aspects such as adaptability to changing environments and disruptive technologies. This will help guide managers to make decisions with respect to building and sustaining organization capital.

#### *Layout of this survey*

This survey of academic research on organization capital proceeds as follows:

- Tracing academic research – evolution of thoughts – on organization capital;
- Outlining measures of organization capital that have been developed;
- Summarizing the evidence on the relationship of organization capital to performance and risk; and
- Providing a framework and a roadmap for future research on organization capital.

## **FACETS OF ORGANIZATION CAPITAL**

### *Employees*

Prescott and Visscher (1980) were the first to use the term organization capital in the economics literature. They view the enterprise as an agglomeration of employees and consider the information that resides in the enterprise with their employees as organization capital. In particular, they consider enterprises having information on employees' abilities which helps enterprises to match employees to jobs, match employees to work teams and enhance human capital through on-the-job training – all of this information collectively is organization capital.

Many subsequent studies consider organization capital as a resource that emanates and resides in the employees, and the human capital helps to increase the productivity of the company. Eisefeldt and Papanikolaou (2013) consider organization capital as a production factor that is embodied in the company's key talent. They do not elaborate on the ways in which the key talent is identified or formed. Van Rens's (2004) notion of organization capital stems from employees performing activities that enhance the enterprises' future production. Carlin, Chowdhry and Garmaise (2012) consider organization capital as tacit knowledge that employees at lower levels of hierarchy who later become occupy higher level positions develop and learn. Black and Lynch (2005) elaborate on Prescott and Visscher's (1980) definition and consider organization capital as arising from three components: workforce training, employee voice and work design.

### *Commitment to Values and Norms*

Tomer (1998) considers organization capital as the fit between the enterprises' values and norms with that of the employees, and the commitment to continue with and adhere to the values and norms. Ludewig and Sadowski (2009) define organization capital

as “If an enterprise succeeds in giving itself an order, including an amount of rules to share information, settle conflicts, secure the willingness to cooperate, then we can call this order with good reason organizational capital.” Jovanovic and Rousseau (2001) consider organization capital as including the founder’s vision, values, commitment to values and intangible (i.e., intellectual assets such as patents or trade secret) and physical assets. These imprints are likely to be persistent because the founder picks successors. Hsu (2007) extends Jovanovic and Rousseau’s (2001) with the notion that some founders and especially serial entrepreneurs demonstrate their ability to successfully take a product concept and create an organization by developing business processes and systems.

#### *Enterprise-specific Knowledge*

Atkeson and Kehoe (2005) define organization capital as the accumulation of organization specific knowledge. A new organization will have the state of the art technology but no organization capital; and as organizations age they may become laggards in technology but have built up organization capital. Carmona-Lavado, Cuevas-Rodriguez and Cabello-Medina (2010) consider organization capital as a component of intellectual capital and distinct from human and social capital. Organization capital is the codified knowledge, i.e., knowledge generated within the company through formal processes of knowledge integration, which then can be used by any other employee in the organization – examples are, marketing measurement systems that transform the salesperson’s experience into useful managerial information. Similarly, Wright et al. (2001) and Youndt et al. (2004) define organizational capital as knowledge institutionalized within organization processes and databases, documents, patents and manuals that organizations use to store and retain knowledge. Organizational capital is organizational memory and represents a way of

sharing interpretations within the company, which go beyond the individual level and preserve the knowledge of the company's history, even when key individuals leave it.

### *Process and Structure*

Evenson and Westphal (1995) define organization capital as, “....the knowledge used to combine human skills and physical capital into systems for producing and delivering want-satisfying products.” This definition is broad in that it encompasses codified and tacit knowledge that is required to convert resources into value-enhancing products or services.

Teece et al.'s (1997) introduces the resource based view to organization capital by emphasizing the company's capabilities in terms of the organizational structure and managerial processes that underpins productive activity. Furthermore, in a dynamic context of creative destruction, the importance of organizational structure and managerial knowledge goes beyond ensuring an efficient combination of inputs into successful products, but determines a company's ability to react and adapt to changing business environments. A company's dynamic capabilities and its ability to reconfigure its production to enter new markets and to up-grade its activity in global value-chains is key to long-term survival, and rests on superior management qualities and flexible organizational structures. Martin-de-Castro, Navas-Lopez, Lopez-Saez and Alama-Salazar (2006) provide a framework that integrates the resource based view with organization structures and asset management. Lev (2001) considers organization capital as the unique structural and organizational designs and business processes that helps generate competitive advantage. He considers organization capital as a distinct intangible asset – other intangible assets are discovery/learning intangibles, customer-related intangibles and human-resource intangibles.

CIC (2003) defines organization capital as “the combination of explicit and implicit, formal and informal knowledge which in an effective and efficient way structure and develop the organizational activity of the company, that includes culture – implicit and informal knowledge; structure – explicit and formal knowledge; and organizational learning – implicit and explicit, formal and informal renewal knowledge processes.”

Lounsbury and Ventresca (2002) and Agterberg et al., (2010) emphasize the social network of employees as organization capital. Gulati (1998, 1999) extend the notion of organization capital to social network with external stakeholders such as suppliers and customers, joint ventures and inter-company alliances. In particular, the operational challenges faced by global companies makes it important to incorporate the interaction of a company’s internal and external networks and combining local networks with transnational culture and practices.

Lev and Radhakrishnan (2005) elaborate on Evenson and Westphal’s (1995) definition by considering organization capital as the agglomeration of technologies and practices that enable some companies to efficiently extract from a given level of physical and human resource a higher output than other companies. Both Lev and Radhakrishnan (2005) and Evenson and Westphal (1995) consider organization capital as an enabler that helps convert tangible resources – physical and human – into output. In this view the tangible resources are inert, and unless interacted with organization capital they do not provide any value by themselves. While Evenson and Westphal (1995) couch their enabling feature in terms of knowledge, Lev and Radhakrishnan provide a myriad of processes and practices that are considered to be cutting-edge management practices. CIC (2003) alludes to the enabling notion by incorporating knowledge, structure, culture and learning.

### *Summary & Commentary*

Organization capital is a multi-faceted concept and encompasses the following traits:

- a. Organization capital is the information/knowledge embodied in employees. As such, business practices that facilitate/enhance the knowledge embodied in employees such as employee training, empowerment and job design will enable companies to utilize the physical resources more efficiently, and thus garner a competitive advantage.
- b. Organization capital is the companies' values and norms. Values and norms that enable companies to utilize the physical resources more efficiently will help create and sustain competitive advantage.
- c. Organization capital is the company-specific codified and tacit knowledge that enables companies to combine physical resources to generate output.
- d. Organization capital is embodied in the set of business processes and practices that enable some companies to combine physical resources more efficiently than others to generate output. In a dynamic business environment – with constant changes due to disruptive technologies in terms of ways of doing business – organization capital provides the underpinning for companies to adapt and respond.

Even though humans are at the center of all aspects of organizations – it is the humans that breathe life into the organization, make decisions on commitment to values and norms, create and use business practices and systems, build the network of relationships – considering only the human resource without considering various mechanisms and ways in which organizations commit to norms and values, develop and adapt business processes and systems will not a good enough understanding of organization capital that can help guide

managers. Similarly, company-specific knowledge and commitment to values and norms are important aspects that contribute to organization capital. Without these characteristics a company is not likely to have any organization capital. However, each of these captures only one dimension. The broad definition of agglomeration of business processes and practices embodies all the aspects of the narrow definitions, and is in that sense more holistic. However, the broad definition cannot provide guidance to develop and manage organization capital. One thing is for sure, the very nature of organization capital makes it a very challenging intangible asset to measure and manage. Given the multi-dimensional and all-encompassing nature of organization capital, the measure needs to be holistic, and the black box needs to be pried open to link the measure to business processes and systems so as to effectively guide managers/leaders in their quest to create and manage organization capital. .

### **MEASUREMENT APPROACHES FOR ORGANIZATION CAPITAL**

There have been two principle approaches to measuring organization capital – a measure based on outlays/inputs, and a measure based on the ‘extra’ that a company generates from its physical and human capital.

#### *Input-Based Macroeconomic Measures*

At an economy-wide, macro-level, how does the agglomeration of intangibles (as opposed to brick-and-mortar) assets affect economic growth. Corrado, Hulten and Sichel (2005) argue that at an economy-wide level, measuring and treating outlays on intangible assets which includes organization capital will provide a distorted picture of economic growth. Corrado, Hulten and Sichel (2005) show that the measure of macroeconomic growth can be distorted considerably, if the expenditures on intangible assets are not capitalized similar to brick-and-mortar assets. Drawing upon Lev’s (2001) framework



Corrado, Hulten and Sichel (2005) consider the following broad groups of business intangibles:

- a. Computerized information: Knowledge embedded in computer programs and computerized databases.
- b. Innovative property: Knowledge acquired through scientific R&D and nonscientific inventive and creative activities.
- c. Economic competencies: Knowledge embedded in company-specific human and structural resources, including brand names.

For each group, they measure the expenditures/outlays in the following manner:

- a. Computerized information:
  - i. Expenditures on software developed for a company's own use – developed internally, purchased or custom software expenditures.
  - ii. Expenditures on development of computerized databases, however due to data limitations the purchased component is small.
- b. Innovative property:
  - i. Costs of new products and processes leading to a patent or license.
  - ii. Spending for acquisition of new mineral reserves.
  - iii. Spending for the development of entertainment and artistic originals usually leading to a copyright or license.
  - iv. Spending on new product/service development in the financial services industry, new architectural and engineering designs and social sciences.

These expenditures are not likely to result in patents or copyright.
- c. Economic competencies:

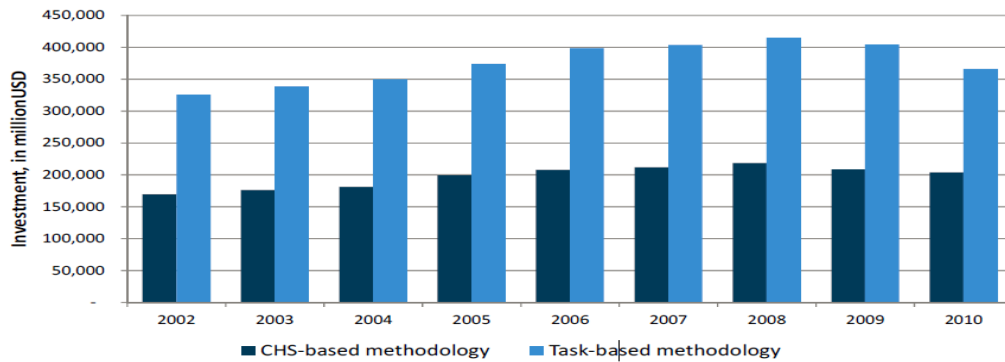
- i. Advertising and market research expenditures for the development of brands and trademarks.
- ii. Costs of on-the-job training and tuition payments for job-related education.
- iii. Costs of organization change and development measured using the revenues of the management consulting industry and wages in executive levels.

Squicciarini and Mouel (2012) develops a task based approach to measure organization capital at the sector and country levels. They use the Occupational Information Network – O\*NET data from the US Department of Labor and identify 22 managerial occupations using cluster analysis. Their premise is that these 22 managerial occupations create organization capital. They then combine these 22 managerial occupations to with the compensation data at the sector level obtained from the US Current Population Surveys. Following Corrado, Hulten and Sichel (2005) they use 20% of compensation paid to these 22 managerial positions as organization capital investments. They capitalize and amortize these investments using sector specific depreciation rates. They find that their organization capital estimates are roughly 90% higher than those measured by Corrado, Hulten and Sichel (2005).

Figure 5 provides the comparison of using the task-based and the input-based approaches to measure organization capital at the national level.

**Figure 5**

## INVESTMENT IN ORGANIZATIONAL CAPITAL AT THE NATIONAL LEVEL U.S.



Source: Squicciarini and Le Mouel (2012) and OECD calculations based on the earnings data by occupation and industry from the Annual Social and Economic (ASEC) Supplement of the Current Population Survey (CPS), US Bureau of Labor Statistics, 2003-2011.

The investment in organization capital using the task based methodology is roughly 90% higher than that of the Corrado, Hulten and Sichel's (2005) expenditure based methodology. Interestingly, both methods exhibit similar trends, i.e., there is an increase in the investment from 2004 up until it peaks in 2008, and then declines in 2009.

### *Input Based Company-specific Measures*

Brynjolfsson and Hitt (1995, 1998, 2000) measure information technology capital using proprietary data from Computer Intelligence Corporation. The replacement cost of all information technology assets owned by companies is considered as information technology capital. The premise behind the measure is that information technology assets have impacted the business practices and processes; and as such constitutes an important intangible asset. The authors do not particularly relate information technology capital to organization capital.

Lev and Sougiannis (1996) measure research and development capital by capitalizing research and development expenditures and amortizing it roughly over five

years. While clearly, the authors intention was not to consider research and development capital as capturing all aspects of organization capital, to the extent that research and development outlays helps to maintain company-specific knowledge, we consider it as part of organization capital.

Eisfeldt and Papanikolau (2013) measure organization capital by capitalizing and amortizing the Selling, General and Administrative expenses (SG&A). The use of SG&A is motivated by Lev and Radhakrishnan (2005) who use SG&A as an instrument to measure organization capital (to be discussed later). SG&A expenses includes research and development, advertising, marketing, managerial compensation, training, consulting and information technology related expenses – all of which are outlays that create organization capital (see Lev, 2001). They capitalize SG&A expenses and amortize it at a rate of 15%: the depreciation rate corresponds to a useful life of outlays of roughly 7 years.

De and Dutta (2007) examine the Indian software industry and find that capitalized values of advertising and marketing expenses, i.e., brand capital and administrative expenses, i.e., organization capital are positively associated with the output.

#### *Survey-Based Company-specific Measures*

Black and Lynch (2005) consider organization capital being embedded in employees and provide a measurement framework for the three components – workforce training, employee voice and work design – using surveys.

The training-related questions encompass the following aspects.

- a. Types of training offered (basic, workplace-related job skills) along with reason for training.
- b. Incidence of formal and informal training programs
- c. Types of training offered including computer skills training, team work

- training, sales training, new methods training, off-the-job training
- d. Proportion of workers trained by five occupational categories
- e. Costs of training as a share of total labor costs
- f. Reasons for training (technology, skill specificity, seniority, retention); does training occur off the job.

The employee-voice related questions encompass the following aspects.

- a. Existence and proportion of employees in formal information sharing programs.
- b. Existence and proportion of employees covered by attitude surveys.
- c. Existence of formal grievance procedures or complaint systems.
- d. Proportion of employees that participate in quality of work life, quality circles, labor-management participation programs, total quality management programs, worker teams.

The work-design related questions encompass the following aspects.

- a. Existence of formal job design programs.
- b. Practices of benchmarking, reengineering, number of managerial levels, use of job rotation and job sharing

While they examine the employee dimensions for which data can be collected in a survey, they do not relate this to organization capital.

#### *Extra Output Based Company-specific Measure*

Lev and Radhakrishnan (2005) consider a production function wherein the company's output is a function of the physical capital, human capital and innovation capital. The physical, human and innovation capital are inputs, i.e., resources that all companies in the same industry/sector use, there are significant differences across companies in the

efficiency of use or contribution of the resources to revenues. For example, while companies A and B use employees, Company A's employees may generate more revenues per employee than B's because they are better trained and/or supported by superior information technology and/or have better management and business practice. Similarly, while both A and B have physical capital (brick and mortar assets), Company A may generate more revenue per unit of physical capital because it uses more efficient technology. In short, there are many reasons why companies differ in the efficiency of resource usage, but most of these reasons (better IT, higher quality employees, improved management practices, improved incentive and compensation systems) are related to the organization capital. Accordingly, they compare across companies the efficiency of using the resources in generating revenues.

Lev and Radhakrishnan (2005) use the selling, general and administration expense as an instrumental variable because the outlays that result in organization capital are likely contained in such outlays. Specifically, they simultaneously estimate the production function and the selling, general administrative expenses as follows:

$$\begin{aligned} \log(\text{SALE}_{it}/\text{SALE}_{i,t-1}) = & b_{0t} + b_{0st}\log(\text{SGA}_{it}/\text{SGA}_{i,t-1}) \\ & + b_{1t}\log(\text{PPE}_{it}/\text{PPE}_{i,t-1}) + b_{2t}\log(\text{EMP}_{it}/\text{EMP}_{i,t-1}) \\ & + b_{3t}\log(\text{RND}_{it}/\text{RND}_{i,t-1}) + \log(e_{it}/e_{i,t-1}). \end{aligned} \quad (1)$$

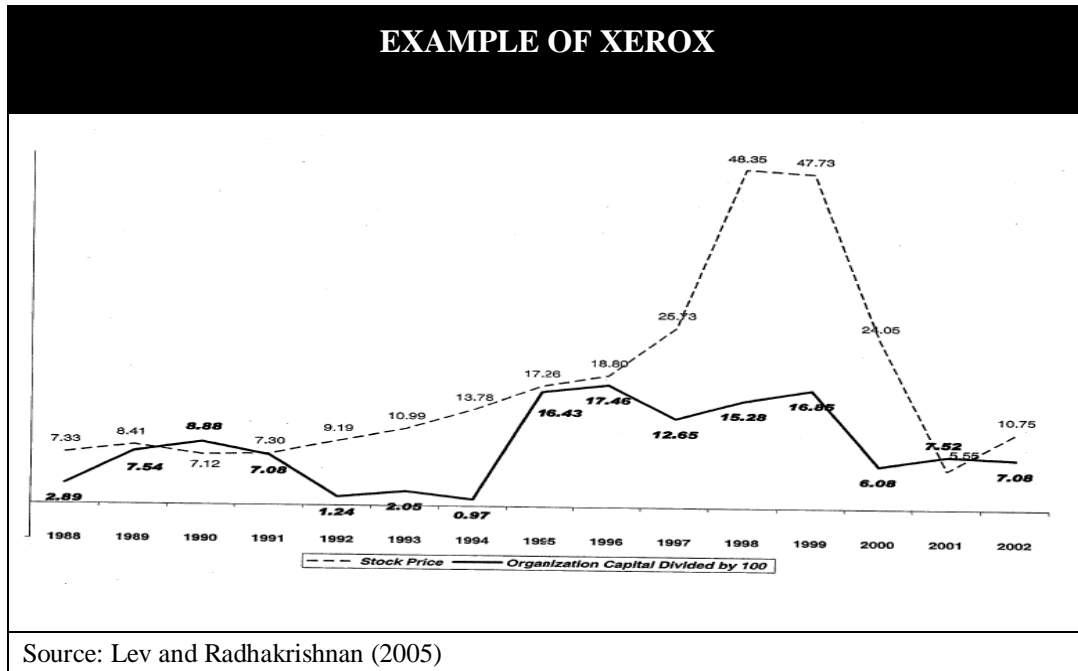
$$\begin{aligned} \log(\text{SGA}_{it}/\text{SGA}_{i,t-1}) = & g_{0t} + b_{1t}\log(\text{SALE}_{it}/\text{SALE}_{i,t-1}) \\ & + b_{1t}\log(\text{SGA}_{it-1}/\text{SGA}_{i,t-2}) + \log(u_{it}/u_{i,t-1}). \end{aligned} \quad (2)$$

The extra revenues generated by a company given their level of resources in a year is the difference between the predicted revenue with and without organization capital in equation (1) as captured by the instrument of selling, general and administrative expenses. This extra revenue is presumably arises because of the stealth asset – organization capital.

The annual extra revenue is capitalized and amortized over five years to get an estimate of organization capital.

Figure 6 presents the example of Xerox's organization capital.

**Figure 6**



The line and numbers in bold are organization capital divided by 100. The dotted line and associated numbers represent the stock price adjusted for stock splits. Xerox's sales and net income (not shown in the Figure) increased up until 2000; Xerox's stock followed suit with a sharp increase during 1988-2000; but crashed in 2001-2002. Investors were clearly surprised by Xerox's collapse. Xerox's organization capital, however, exhibits a different pattern. The annual contributions of organization capital to output was roughly \$700-1200 million throughout 1988-1997. From 1998, however – two years before the downturn in sales and the stock price – Xerox annual organization capital contributions decreased sharply to about \$700 million, in the following three years. Thus, the organization capital measure provided a two-year advance warning of Xerox travails.

Lev, Radhakrishnan and Zhang (2009) extend the Lev and Radhakrishnan (2005) measure to include not only extra revenues but also extra operating costs. They estimate equation (1) annually and cross-sectionally for each industry. The coefficient estimates indicate the average contributions of organization capital to revenue growth. For each company in a given year, equation (1) with estimated coefficients is used to predict the revenues under the average efficiency assumption without organization capital. Then the predicted company's revenues without organization capital is subtracted from the company's actual revenues to get the extra revenue,  $AbSALE_t$ , which is the contribution of organization capital to revenue for that particular year. Similar to the computation of contribution of organization capital to revenues, the contribution of organization capital to cost containment is estimated. In this estimation operating costs replace the revenues in equation (1), and an additional variable is added as a regressor, the residual of sale from equation (1). The additional variable is added to the operating cost equation to accommodate the additional costs incurred for unplanned extra revenues. Then, the difference between the predicted cost and the actual cost,  $AbCOST_t$  is the contribution of organization capital to cost containment for that particular year. The sum of  $AbSALE_t$  and  $AbCOST_t$  capitalized and amortized over five years is the estimate of organization capital.

Figure 7 presents the example of Dell for this measure.



**Figure 7**

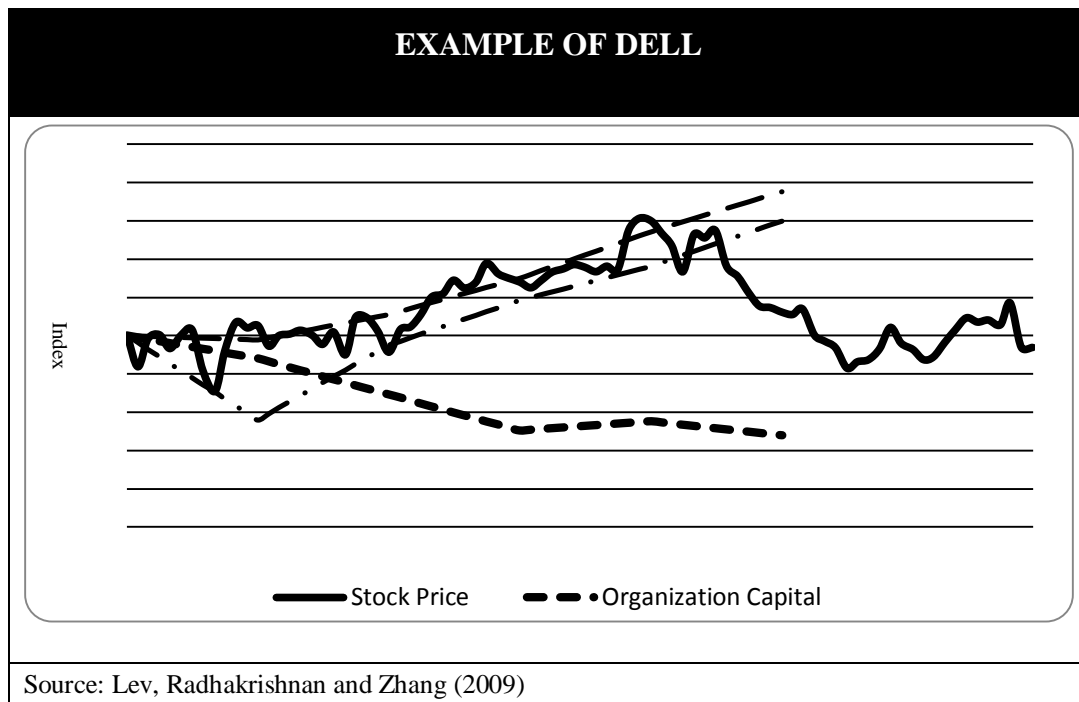


Figure 7 presents the sales, net income, organization capital and stock price data for Dell from 2001 to 2007. We scale all these variables by their respective levels as of 2001, i.e., all the variables are indexed to one in 2001. Sales, net income and stock price exhibit similar trends from 2002 to 2005: Starting 2005 the stock price starts to decline precipitously until the beginning of 2006, due to concerns over governance practices and accounting irregularities. The organization capital measure shows a different trend. Starting from 2001 the organization capital measure drops up until 2004 and flattens out for 2005. This is starkly different from the backward looking sales and net income measures, which exhibit an increasing trend in this corresponding period.

#### *Summary & Commentary*

The approach for measuring organization capital at the macroeconomic level is geared towards helping regulation and policies at the governmental level [see OECD, 2013]. While input-based measures are appropriate at the macroeconomic level, because the

government does not directly decide on the resource outlays for the companies and as such is not likely to create perverse incentives.

The input-based, company-specific measure as well as the survey based, company specific measure could create perverse incentives. If managers/companies are “rewarded” for making outlays, then managers may have a tendency to make such outlays even if it is not appropriate for their business model. Similarly, with the survey-based approach to measuring organization capital managers are likely to institute programs that are fashionable even though they may not be appropriate. The extra-based, company-specific measure is not likely to induce such dysfunctional behavior. However, the disadvantage of this approach is that it is a black-box and hence it will not help guide managers with managing organization capital. Given that the extra measure helps to avoid perverse incentives, the quest should be to understand whether the extra-based measure incorporates the elements and mechanisms that the input-based measures help to capture.

## **EVIDENCE THAT ORGANIZATION CAPITAL MATTERS**

### *Macroeconomic level*

Corrado, Hulten and Sichel (2005, 2006) estimate the components described in the measurement section above and find that the spending on intangible assets was roughly 8-9% of GDP in the early 1990s and increased to 10-12% of GDP in the late 1990s. They then capitalize these expenditures and amortize them over different periods, based on the category of intangible asset. They show that the GDP growth is understated by roughly 4% in the early 1990s and 7% in the late 1990s.

Corrado, Hulten and Sichel (2009) use the Corrado, Hulten and Sichel (2005, 2006) measures and find that roughly \$3 trillion of intangible assets including organization capital is excluded from the U.S. published data in 2003. Including this intangible asset they find

that the rate of change of output per worker exhibits a much faster rate of growth, than when the intangible asset is not included – also see Corrado and Hulten (2010). Roth and Thum (2010) document similar evidence by accounting for company intangible outlays for Europe.

Corrado, Haskel, Jona-Lasinio and Iommi (2012) extend the Corrado, Hulten and Sichel (2005) measurement to countries in the European Union. In doing so, they harmonize the definitions and measures across the countries. As with the U.S., they find that the GDP growth is understated in the European countries. Hulten and Hao (2012) use the Corrado, Hulten and Sichel (2005, 2006) measure to the Chinese economy, and find that intangible assets that includes organization capital likely played an important role in China's transformation to a market-oriented economy.

Squicciarini and Mouel (2012) adopt the definition of organization capital as company-specific knowledge embedded in employees. They extend the Corrado, Hulten and Sichel (2005, 2009) framework of developing organization capital measure at the aggregate level. Specifically, they use the Occupational Information Network data from the US Department of Labor and identify 84 occupations categories, of which they classify 22 managerial occupations as ones that generate organization capital. They recalibrate the organization capital and the depreciation rate estimates, and find that the OC appears to be understated and depreciation rates overstated by Corrado, Hulten and Sichel (2005, 2006) – see Figure 5.

Overall, the findings show the increasing importance of organization capital in the globally connected world. The bias in the GDP growth rate that is documented at the country level, is well-known in the accounting literature. The intuition for this is similar to the R&D expenses being charged as expenses instead of being capitalized. For a company

that is spending a lot more R&D, the current earnings is understated, and vice versa. Similar to Corrado, Hulten and Sichel's findings, Lev, Sarathand Sougiannis (2005) show that when the R&D growth is greater than the growth in earnings, the reported earnings are understated, and vice-versa; and these understatements and overstatements have real consequences in terms of stock price mispricing. As such, when the growth in a country's investments in intangibles is more than the growth in GDP, the GDP will be understated as it is with companies as well. Noting this there are many studies in the accounting literature which shows the value-relevance of such adjusted intangible assets (for example, see Lev and Sougiannis 1996).

*Input-based, company-specific level*

Hulten and Hao (2008) use the Corrado, Hulten and Sichel (2005, 2006) procedure for 617 R&D intensive companies and find that intangible assets that includes organization capital increases shareholders equity by 141% and total assets by 57% and increases earnings per share from an average of \$2.48 to \$3.54. They also find that including the estimate of intangible assets that includes organization capital increases the shareholders equity to 75% of stock market value as opposed to conventional shareholders equity without these intangible assets accounting for only 31% of the stock market value. Hulten (2010) uses this measure for one company Microsoft and relates the company's growth to the growth of intangible assets.

A number of papers capitalize and amortize SG&A expenses (the instrument in Lev and Radhakrishnan, 2005) and show that organization capital is positively associated with risk. Eisfeldt and Papanikolaou (2013) measure organization capital by capitalizing and amortizing SG&A expenses and find that compared to firms with low organization capital, firms with more organization capital have 4.6% higher average returns. They argue that

organization capital is a production factor that is embodied in company's key talent. Since both the investors and the managers have a claim to the output, the company is riskier from the investor's perspective. As such, the additional average returns is consistent with additional risk that is priced-in by the investors for companies with higher organization capital. Che (2009) also measures organization capital by capitalizing and amortizing SG&A expenses and it to be positively associated with sales volatility. She conjectures that investments in organization capital involves subjective decision-making, trail-and-errors and unexpected success and failures; all of which increases company-specific risk. They show that organization capital measured as selling, general and administration expense is positively associated with sales growth volatility.

Li, Qiu and Shen (2014) measure organization capital by capitalizing and amortizing SG&A expenses and find that acquirers with higher organization capital exhibit higher announcement period returns, and better post-merger operating and stock performance. Miyagawa and Kim (2008) capitalize and amortize R&D and marketing expenditures and find that they are positively associated with stock market value for Japanese manufacturing firms. Gourio and Rudanko (2014) find that selling expenses, one of the inputs into organization capital, is positively correlated with market-to-book value, future profits, future sales, future gross margins and future level and volatility of company investments.

Brynjolfsson, Hitt and Yang (2002) and Bresnahan, Brynjolfsson and Hitt (2002) find that each dollar of information technology capital is associated with roughly ten dollars of stock market value. Furthermore, Bresnahan, Brynjolfsson and Hitt (2002) find evidence of strong complementarity between several indicators of IT use, workplace organization and the demand for skilled labor. Cummins (2005) finds that the information technology

expenditures are associated with the imputed equity value of the company, where the imputed value of the company is computed using the analysts' earnings forecasts.

Lustig, Syerson and Nieuwerburgh (2011) argue and find evidence consistent with the notion that the increased importance of organization capital would result in an increase in managerial income inequality and pay-for-performance sensitivity. Their evidence suggests that successful firms retain their high ability managers and the organization capital they create by providing higher compensation. Martin-Oliver and Salas-Fumas (2012) measure organization capital using training expenses and find a positive association between such expenditures and the market value of equity for Spanish banks.

Collectively, various inputs – marketing expenditures, administrative expenditures, research and development expenditures, information technology expenditures, training expenditures – mostly contained in SG&A expenses and considered to be part of organization capital, are related to future performance as well as increased risk.

*Survey-based, company-specific level*

Carmona-Lavado, Cuevas-Rodriguez and Cabello-Medina (2010) use the survey of R&D departments of 90 companies and measure product innovation, radicalness of innovation, organization capital and social capital. Organization capital is measured using responses to whether the company has formal systems for project failures and success and formal discussions on learnings from new products. Social capital is measured using responses on whether there is constant communication among managers with other departments, employees of this department and employees of this and other departments. They find that social capital is associated with product innovation and radicalness of innovation; and organization capital influences the innovation outcomes through its influence on social capital.

Ichniowski and Shaw (2003) review the intra-industry studies that use survey based measures for work practices. These studies find that the adoption of coherent system of new human resource management practices – such as, job definitions, cross-training, and work teams – along with extensive incentive pay, results in higher levels of productivity.

Black and Lynch (2001, 2004), Bartel (1989), Bresnahan, Brynjolfsson, and Hitt (2002), Caroli and Van Reenen (2001), Ichniowski (1990), Huselid (1995), Huselid and Becker (1996), and Delaney and Huselid (1996) examine work place practices on productivity and profitability. All of these studies have found a positive correlation between human resource management systems and business performance as measured by labor productivity, Tobin's  $q$ , present value of future cash flows and firm market value. Many of these also demonstrate positive spillover of work place practices onto the final performance.

Bloom and Van Reenen (2007) examine whether management practices help improve labor productivity of capital and labor resources at a company-level across countries. They develop a management score based on practices and processes in four areas: operations, monitoring, targets and incentives. The operations area focuses on the introduction of lean manufacturing practices, the documentation of process improvements and the rationale for such improvements. The monitoring area focuses on tracking and reviewing employee performance and processes for rewards and sanctions. The targets area focuses on whether targets are financial or non-financial, attainable or not-attainable, simple or complex and the wide usage of targets. The incentives area focuses on promotion criteria, pay and bonuses and firing procedures. They find the following: (a) Higher level of competition is associated with better management practices; (b) Management score is positively associated with labor productivity; (c) Family-owned firms in which the CEO is

the eldest male child tend to be badly managed. Bloom and Van Reenen (2010, JEP) summarize their evidence on management practices in developed and emerging economies.

Bloom, Mahajan and Roberts (2013) examine whether differences in management practices across firms can explain differences in productivity in emerging markets. They argue that there are at least two reasons for the answer to the question not being in the affirmative. First, companies may choose the optimal practices given the business conditions, which may not include better management practice. Second, called reverse causality or endogeneity problem in research, it is possible that the more productive firms find it easier to adopt better management practices. The authors provide free consulting to a randomly chosen treatment plants and compared their performance to a set of control plants in the textile manufacturing sector in India. The consulting services focused on factory operations, quality control, inventory management, human resource management and sales and order management. They found that these management practices raised the productivity by 17% in the first year mainly through improved quality and efficiency and reduced inventory. In addition, within three years these successful plants expanded their operations more effectively.

Edmans (2011) examine the relationship between employee satisfaction and company value. Specifically, they find that the “100 Best Companies to Work For” generates an additional stock return of roughly 3.5% after accounting for systematic risk.

Bloom, Sadun and Van Reenen (2012) examine why US multinationals have higher information technology productivity than their European counterparts. They find that US multinationals have better people management practices which in turn helps improve information technology productivity.

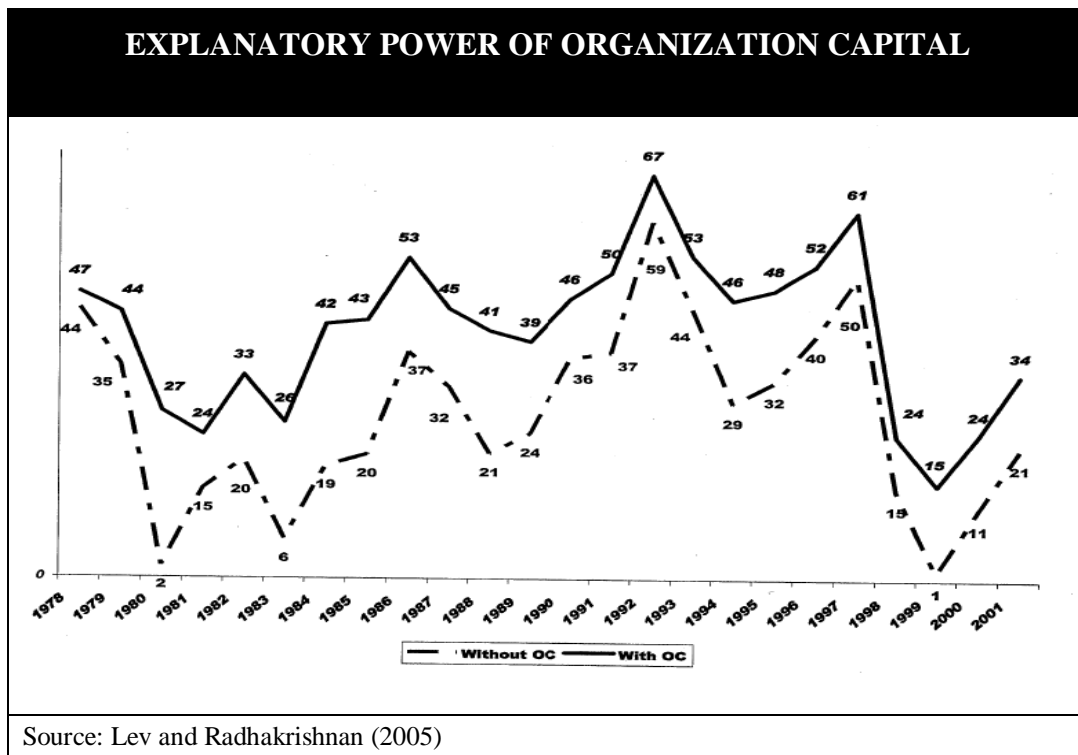


Bloom, Sadun and Van Reenen (2012) examine how trust affects the organization of a company. The idea is that the top-management will delegate important decisions to mid-level managers, only if they trust that the mid-level managers are trustworthy to solve the problem correctly. They measure trust using the World Values Survey, and decentralization through an interview with plant managers by asking questions such as how much capital investment he could undertake without prior approval. They find that trust is positively associated with more decentralization; and a multinational company headquartered in a high trust country is positively associated with decentralization in the foreign operations as well.

*Extra-based measure, company specific level*

Lev and Radhakrishnan (2005) use the extra revenue measure of organization capital and show that the organization capital is positively associated with information technology expenditures. They show that the organization capital measure contributes significantly to the explanation of stock market values of companies, beyond assets in place and expected abnormal earnings.

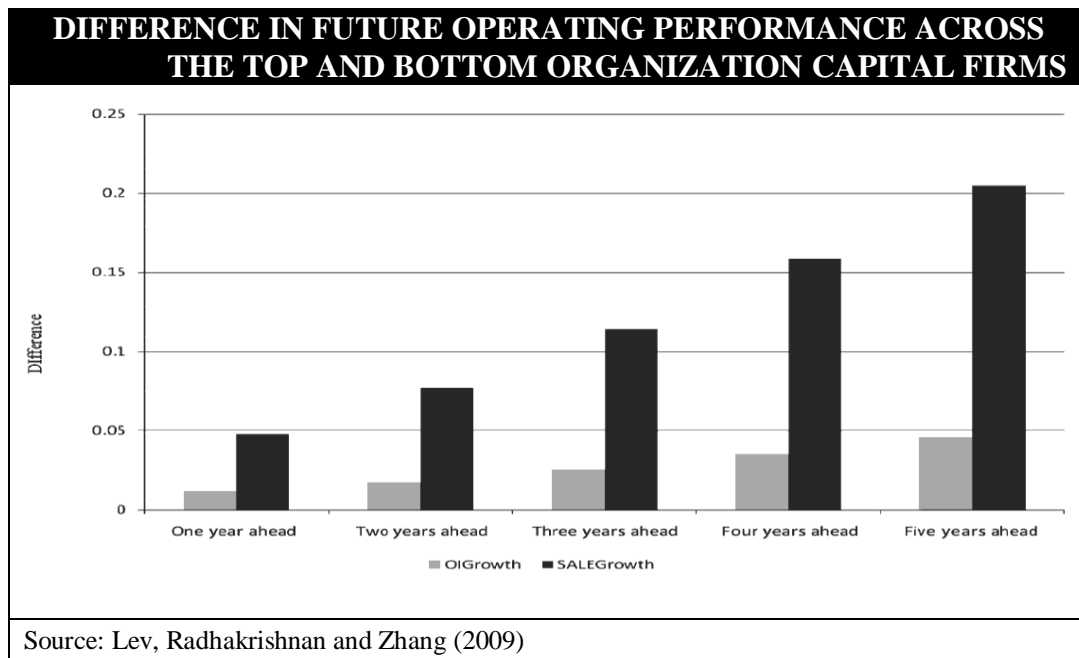
**Figure 8**



The top line is the adjusted  $R^2$  value of the stock price valuation model that includes organization capital, and the bottom line is for the model without organization capital. The figure indicates that the incremental contribution of the organization capital estimate over the information in the valuation based on the analysts' earnings forecasts is positive throughout the period. They suggest that financial analysts do not comprehend the value of organization capital.

Lev, Radhakrishnan and Zhang (2007) use the extra revenue measure of revenue and cost containment and show that this measure is positively associated with various future performance measures: sales growth, operating income growth and abnormal returns for up to five years. Figures 9A and 9B present their evidence.

**Figure 9A**



**Figure 9B**

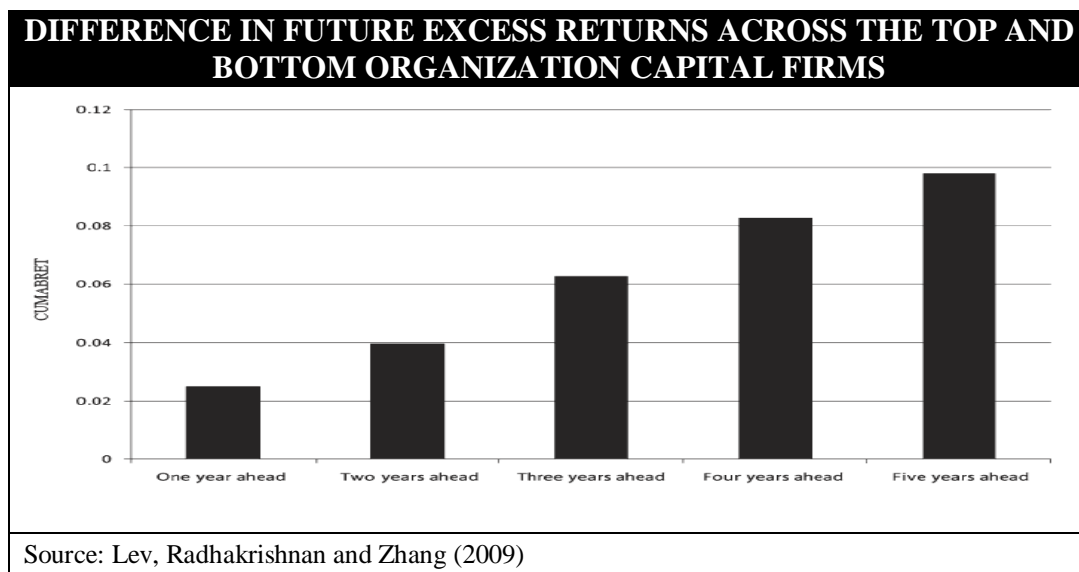


Figure 9A shows the difference in operating income growth and sales growth in future years – one year ahead up to five years ahead; across the top 30% and bottom 30% organization capital groups. The figure shows that firms in the top organization capital group,

consistently exhibit higher operating performance and sales growths up to five years into the future. Figure 9A shows that the risk-adjusted returns in the next five years is also substantially higher for the top organization capital group than the bottom organization capital group. They also show that executive compensation is positively associated with organization capital indicating that the measure of organization capital captures managerial ability. Imrohoroglu and Tuzel (2014) show that the extra measure is positively associated with market-to-book ratio (growth potential), size, investment and hiring rate. Tronconi and Marzetti (2011) show that organization capital is positively associated with company performance.

Piekkola (2010) use the Lev and Radhakrishnan (2003) methodology and validate the measure for Finnish firms. Specifically, she finds that organization capital is positively associated with company size, foreign operations, information technology assets and compensation. Finnish firms with global operations have twice as much organization capital as domestic firms. Ramirez and Hachiya (2006) adopt Lev and Radhakrishnan's (2003) definition and measure of organization capital for Japanese companies. They find that the value of company-specific organizational capital stock is substantially high when compared to traditional assets, and firms with large organizational capital are associated with higher stock returns and productivity.

#### *Other evidence*

Jovanovic and Rousseau (2001) find a strong upward trend in the stock-market share of the largest firms. They argue that this evidence is consistent with their notion that organization capital is likely to be persistent because the founder is likely to pick their successors, and thus the organization's imprints will persist. In effect, organization capital depends on the state of the technology when the company is born and the technologies that

followed. Furthermore, the data appears to indicate that successful implementors of technology enter the (stock) market roughly 15-20 years after the technological revolution.

Atkeson and Kehoe (2005) argue that a new organization will have the state of the art technology but no organization capital; and as organizations age they may become laggards in technology but have built up organization capital. The owners of old organizations command rents because of the built up organization capital. They then calibrate the organization rents to US manufacturing plants, and find that the rents are substantially high.

Hsu (2007) examines organization capital as the capability of the founders of an organization to be successful in terms of raising capital and obtaining high valuations from venture capitalists. The notion here is that some founders and especially serial entrepreneurs have demonstrated their ability to successfully take a product concept and create an organization, i.e., business processes and systems. They find support for the thesis that the founders' education (MBA or PhD), success of prior start-ups and social capital (measured as recruiting the management team through their existing networks) are related to success.

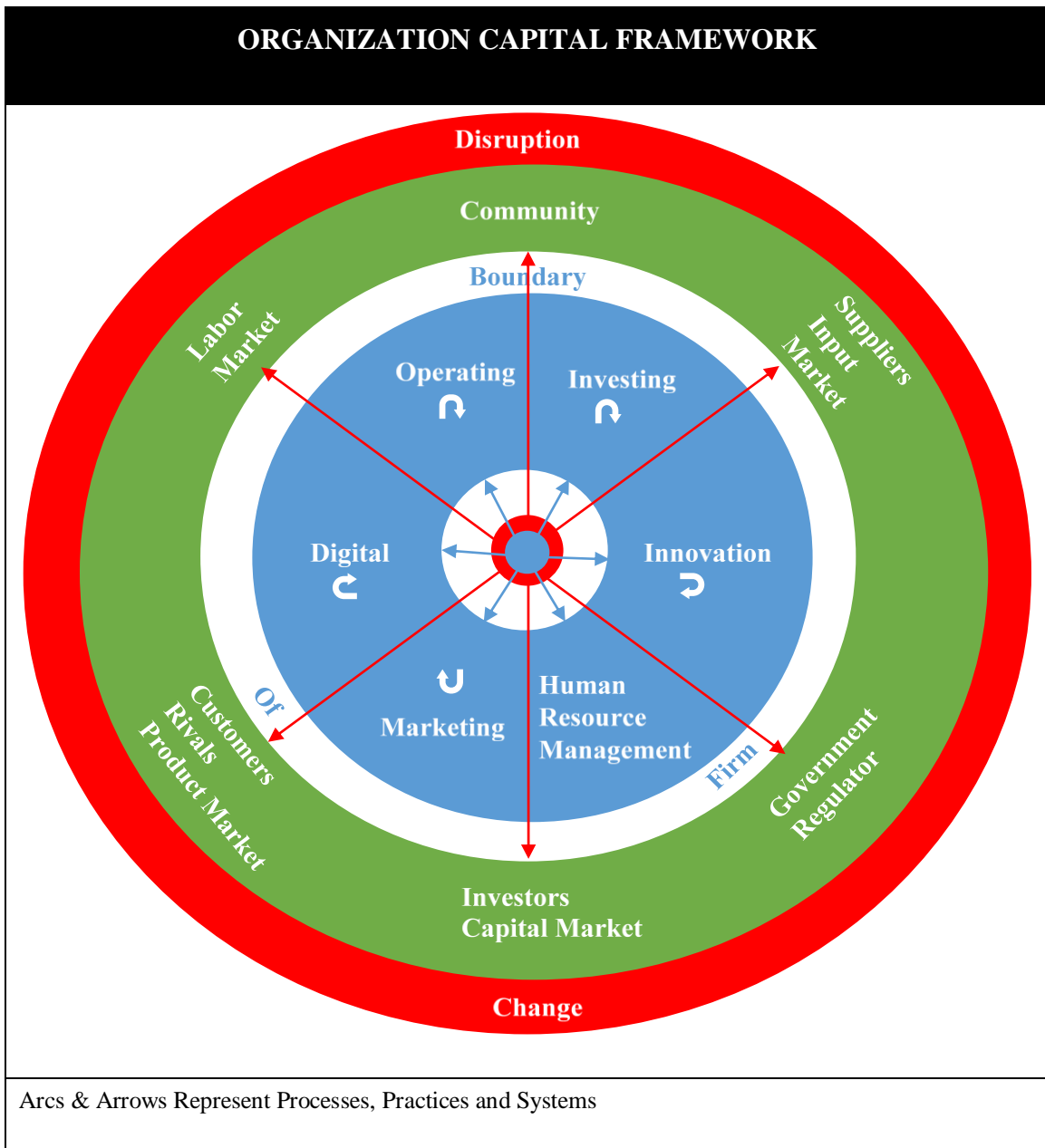
Oshima, Ravikumar and Riezman (2009) incorporate an important aspect of new ventures. The entrepreneur is the creator of organization capital in the sense that the entrepreneur transforms the inert assets (i.e., non-tradable capital) into value that can be derived by various stakeholders (i.e., tradable capital). An important notion embedded here is that the founders create this organization capital and then sell the company, thereby transforming organization capital into returns for his ability. Following on this path, Faria (2008) develop a model of mergers and provide insights into the market for organization capital. The premise is that acquirers merge with targets to gain access to their organization capital; and firms that have learn new technologies fast are not necessarily the ones that

manage it best once the technology is mature. This organization capital arising from learning from new technology, gives rise the merger waves because it is the market for organization capital.

### **A FRAMEWORK FOR ORGANIZATION CAPITAL**

Figure 10 pictorially depicts the organization capital framework.

#### **Figure 10**



A company/enterprise creates and sustains the following capabilities.

- (a) *Operating capabilities*, such as product design systems, production management and engineering (e.g., just-in-time inventory), input outsourcing (supply channels), identifying, incentivizing, retaining high ability vendors;

- (b) *Marketing capabilities* such as developing marketing technologies (e.g., on-line distribution channels), acquiring and sustaining customers, brand creating and preservation;
- (c) *Investment capabilities*, such as advanced project selection mechanisms (e.g., using real-options methodologies for project evaluation), and financial engineering in fund raising and risk management (e.g., hedging assets, liabilities and currency exposures with financial derivatives);
- (d) *Innovation capabilities*, such as unique R&D procedures (e.g., a scientific approach to drug development), adaptive capacity for learning from others, share information among employees, appropriate maximal benefits from intellectual property (e.g., patent licensing and technology turf protection);
- (e) *Human resource management capabilities*, such as identifying, incentivizing, retaining talented employees, commitment to values and trust, teamwork, personnel training; and
- (f) *Digital capabilities*, such as big data analytics, customer information driven product design, digitizing products, operations and innovation, digitizing communications with investors and community.

While each capability consumes physical and human resources, they generate tangible and intangible outputs through processes, practices and systems (PPS) – denoted by the arcs within the capability. The PPS within a capability are connected to all other capabilities – denoted by the blue arrows – with the blue center indicating the hub of connections between all capabilities. The PPS within the enterprise/company are further connected with the external environment made up of the various factor markets –product market, input market,



labor market, capital market – and the community and government. The PPS connecting the enterprise/company with the external environment are denoted by the red arrows with a red hub. It is these multitude of interconnections within the company, and the interconnections of the capabilities with the external stakeholders that forms the *heart* of organization capital. In essence, the core of organization capital is given by the innermost blue and red circles, which govern all such interconnections. It is in this sense that organization capital is an enabler or facilitator that helps to combine all resources into output. Thus, organization capital is an agglomeration of processes, practices and systems that together enable companies to consistently and efficiently convert physical and human resources to output/value.

The processes, practices and systems evolve and adapt to changes brought about by the emergence of disruptive technologies. We outline some changes over the last century to highlight the notion that even though the various capabilities were required to effectively run a company, the relative importance changed over time and so did the ways of doing business – the processes, practices and systems.

- 1910s-1940s: The strict regimented hierarchical command-and-control structure. Scientific management with specialization as the key ingredient for efficiency. Decentralization and performance measurement techniques with cost containment evolved. Economic incentives for employees predominant, even though importance of non-economic incentives was known – Hawthorne experiments.
- 1940s-1960s: More conglomerates and increased globalization with group-oriented leadership and “softer” management/leadership styles than the command-and-control, top-down leadership advocated. Performance

measurement systems based on transfer pricing and profit centers and capital budgeting with discounting future cash flows evolved.

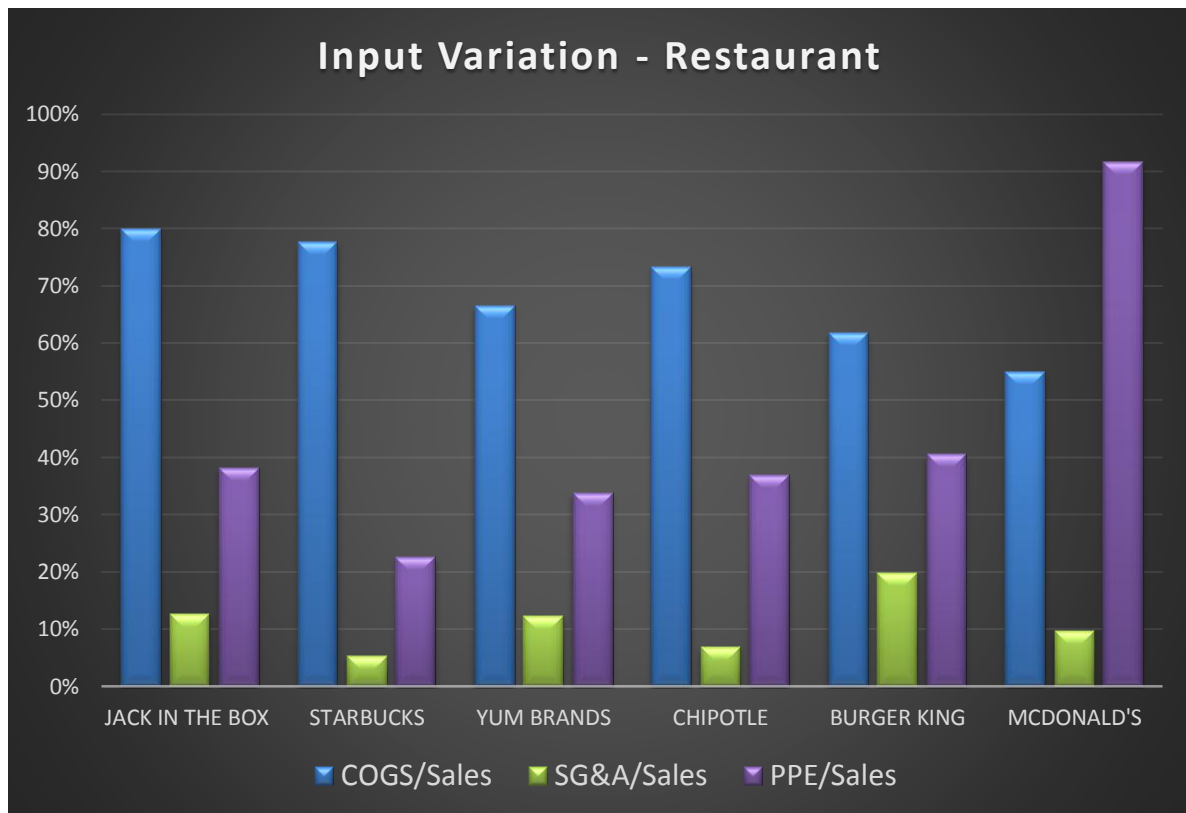
- 1970s: De-conglomeration and increased efficiency and quality from Japan and Germany. More free market orientation with airline and telecomm deregulation. The maturation of information technology.
- 1980s: The era of entrepreneurial management. Competing with information technology – lean manufacturing, just-in-time, benchmarking. Stock-based compensation plans evolved.
- 1990s: Increased globalization with the liberalization of Asia and Latin America. Strategic alliances, vertical de-integration, outsourcing practices evolved. The advent of electronic commerce. Managing professionals and experts (and not labor).
- 2000s: Continued increase in globalization. The maturation of e-commerce and, democratization of information and potential for virtual organizations.

Even within a capability the way activities are organized changes over time.

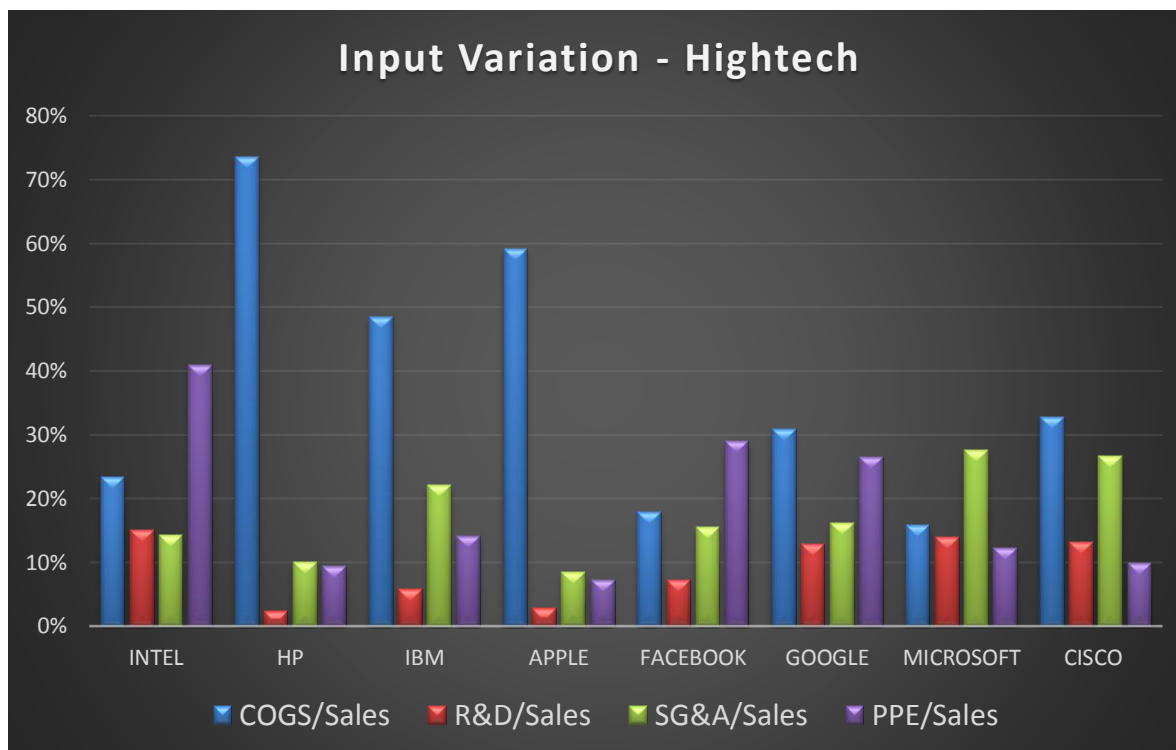
Lombardino (2000) traces the changes in the innovation capabilities of Pfizer. The four-fold increase research and development expenditure in the early 1970s in Pfizer with research conducted in all worldwide sites required serious re-engineering – project management groups with a matrix team system with senior management committee oversight. This re-engineering culminated in the organization of Early Candidate Management Team and the Global Development Team which enhanced Pfizer's drug discovery potential in the 1990s.

Figures 11A, 11B and 11C depicts the variation in expenses for restaurants, high-tech and retail companies.

**Figure 11A**



**Figure 11B**



**Figure 11C**

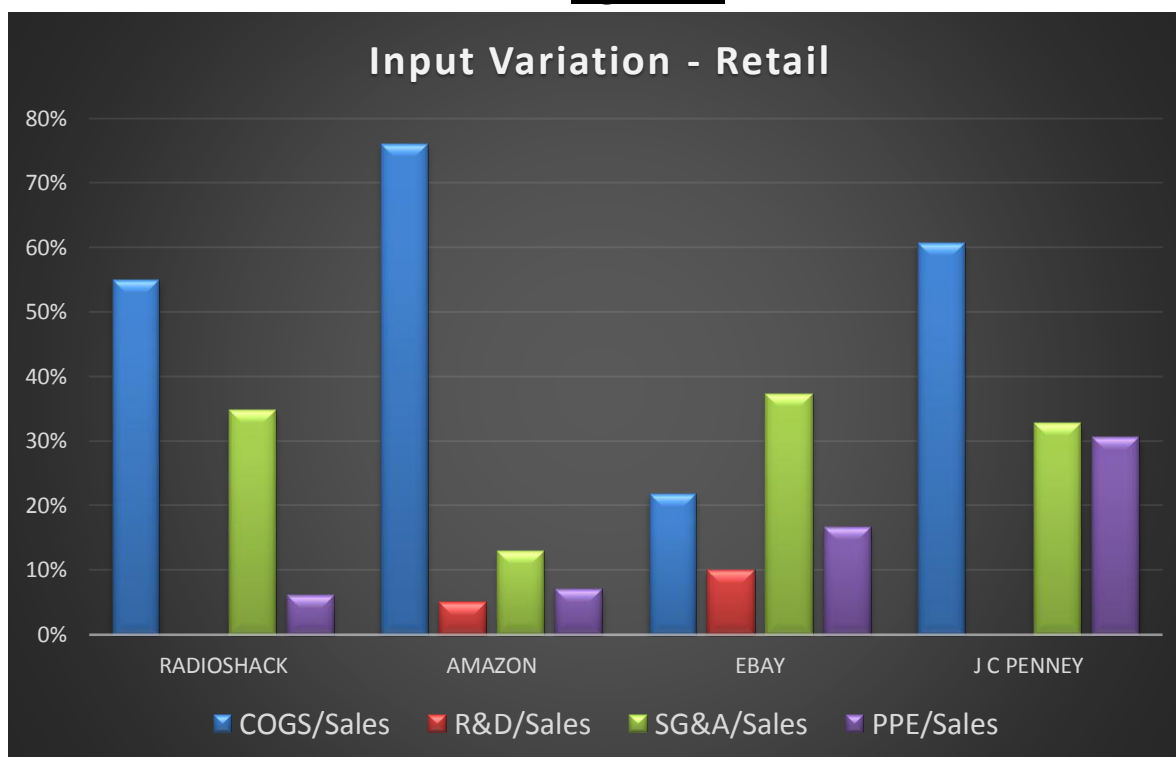


Figure 11 shows that even though companies operate in similar business – for example, fast food restaurants – the three resources utilized are considerably different. This demonstrates that the business model and the drivers of value are considerably different across companies. As such, there may not be a holy grail of “a right way of generating organization capital.”

#### *Attributes of organization capital and measurement challenges*

It is easy to conjure examples of specific business processes and designs that make up organization capital (see Introduction section), and even to conceptualize intuitively this resource as an extra, unmeasured factor of production responsible for abnormal company performance (see Measurement section). The competitive advantages conferred on firms by organization capital are mainly due to the fact that this resource cannot be completely codified and hence transferred to other organizations or imitated by them. The essential elements of organization capital are not transferable across firms, even over extended time periods.

The tacitness of organization capital is among the major reasons this resource is hard to measure, both at the input and output levels. Much of the investment (input) in organization capital is not fully tracked by firms. For example, the cost of on-the-job training, particularly the mentoring of young employees by senior ones, is generally not recorded by the accounting system. Also not recorded as an investment are the extensive efforts of employees to educate themselves and improve the efficiency of firms’ production, research, and selling processes. Consequently, firms and investors lack reliable input (cost) measures of organization capital. Nor is the output of organization capital easy to quantify. Such output—business processes, for example—is essentially an intermediate product

without a market price. The accounting system does not segregate the contribution of organization capital to the company's final output (sales, profits) from the contribution of other inputs, and therefore accounting is not equipped to value organizational capital.

However, measurement challenges does not undermine the importance of measuring so as to better manage this mother of all intangibles.

### *The Road Ahead*

The research agenda for the Center of Global Enterprises will endeavor to understand the following aspects of organization capital and relate it to the measure of organization capital:

- Why do organizational changes – business process, practice and systems – occur? Is it because of disruptive technologies or innovations from within? Is there a difference in the way innovations from outside and inside affect the changes?
- What are the characteristics of process, practices and systems that adapt to change more effectively?
- What are the impediments to such changes, and how are they managed?

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