

Embedding human capital into governance design: a conceptual framework

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Abstract The purpose of the manuscript is to develop a conceptual framework for embedding human capital into governance design and associated corporate governance mechanisms, and attempts to answer the following key research question: How do human capital characteristics such as human capital specificity, complementarities, and uncertainty, affect governance design? The proposed conceptual framework maps different human resource policies as they relate to building and investing in human assets to different human capital governance designs including hierarchy (or firm governance), contract-based governance (e.g., outsourcing and/or off shoring) and market-based (or arms' length) employment contracts. By identifying the most important human capital attributes and linking them to governance modes, this manuscript attempts to fill a research gap by building a conceptual framework to guide optimal human capital investments policies and align firm-level human capital attributes and governance mechanisms to support and deploy such a strategic resource in the future. The framework may be useful for financial reporting and accounting purposes.

Keywords Human capital · Governance design · Asset specificity · Asset complementarities · Uncertainty

“Henry Ford announced a special dividend, but then reneged, saying that the cash earmarked for the dividend would be spent for the benefit of employees. A shareholder sued on the grounds that corporations existed for the benefit of shareholders and the management did not have the right to improve the lot of workers at shareholders’ expense. Ford lost the case. Subsequently it appeared that Henry Ford reneged on the dividend so that he could purchase blocks of shares at depressed prices” (Brealey et al. 2006, p. 936).

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1 Introduction

While there is general agreement that knowledge assets' management is crucial in firms' future profitability and growth opportunities, there is less consensus in the literature about how to account for, govern, and value investments in human and organizational capital particularly for knowledge-intensive firms and industries with highly specialized and complementary investments in both physical and human assets (Becker 1962, 1993, Friedman and Lev 1974, Rajan and Zingales 1998, Lajili and Zéghal 2006). Specifically, the evolving role of specialized human capital in governance choice and design has received relatively less research attention in the governance literature (notable exceptions include, for example, Masten 1988, Hart 1995, Rajan and Zingales 1998; Williamson 1996). Recently, there has been a renewed research interest in human capital, social networks, and organizational form choice (Campbell et al. 2012; Azoulay 2004; Broschak and Davis-Blake 2006; Ployhart and Moliterno 2011). Increasingly, intangible assets including human capital account for most of firms' values¹ and companies are beginning to stress the strategic value of their human resources and systems. In response to this trend, companies are increasingly recognizing the value of their human capital and are including more information in their annual reports and financial statements about how they are managing this important and critical asset. For example, Telus, a Canadian telecommunications firm included the following in its annual report²:

In the communications industry competition is fierce to acquire highly skilled employees. The loss of employees or deterioration of employee's morale could have significant adverse effects on the performance of TELUS' growth. In order to help contain the costs, the company and its employees share cost increases in the employee benefits program. With competition increasing, employee retention risk is expected to remain elevated throughout 2011. Telus uses both monetary and non-monetary approaches to retain employees. However, there is no assurance that this will mitigate the risk of employees leaving TELUS. To mitigate this risk, TELUS provides employee performance bonuses, share options, restricted stock units and performance stock units, and an employee share purchase plan for both domestic full time and part time employees.

Recognizing that their human assets are critical in company performance is a necessary but probably not sufficient step towards fully incorporating the human resource management function into the strategic design of firms' governance structures. Through recognition of the strategic risks faced by Telus with regards to human resource management, it seems that this company and most likely many others are beginning to embed human resource management into their overall

¹ "70 % of corporate value is from intangible assets (according to Accenture) and skill shortages are acute worldwide... being an attractive employer is critical to keep a sustained comparative advantage" WWW.UNIVERSUMGLOBAL.COM/top50.

² "MANAGEMENT'S DISCUSSION AND ANALYSIS (MD&A)." February 24, 2011. http://about.TELUS.com/investors/downloads/20104Q/2010_MDA.pdf.

corporate governance and stakeholder management. However, and similar to other corporate governance mechanisms and practices, there seems to be a lack of theoretical and systematic foundations for explaining and predicting changes in governance structures. The current paper attempts to partly fill this research gap by focusing on efficient and value-maximizing governance mechanisms that explicitly recognize and depend on human capital and its effective strategic management.

One of the main goals of this paper is to develop a conceptual framework for embedding human capital into governance design and associated corporate governance mechanisms, and attempts to answer the following key research question: How do human capital characteristics (e.g., human capital specificity, complementarities, and uncertainty) affect governance design?

To answer the above question, the paper draws on previous conceptual and empirical research in organizational economics and corporate governance, and more specifically the resource-based/dynamic capabilities view of the firm, strategic human resource management, as well as transaction cost economics and agency/incomplete contracting theories (e.g., Coff 1999; Milgrom and Roberts 1990, 1995, Teece 1986, 2011; Ouchi 1980; Ahmadjian and Robinson 2001; Ahmadjian and Robbins 2005; David et al. 2010; Yoshikawa et al. 2005). Despite the extensive and broad-based literature on corporate governance and firm organization which will be discussed in more detail in the sections below, human capital governance has received relatively less research attention. This is partly due to a lack of an explicit treatment of the interdependencies between various human capital attributes and firm characteristics in terms of complementary assets such as physical capital, financial capital, and intangible assets (e.g., brand capital, reputation, and processes) and the nature and extent of both firm and/or industry-specific as well as exogenous sources of uncertainty. In this paper, it is argued that human capital attributes including firm and industry specificity, degree of complementarities with other firm assets, and uncertainty impact the organizational forms and governance mechanisms observed in certain firms and industries. Thus, this paper attempts to respond to this research gap at a conceptual level and proposes a framework for explicitly matching human capital attributes with governance structures following a comprehensive approach on how human capital has been treated and modeled in prior organizational and strategy literatures.

By having an in-depth analysis of the role of human capital in governance design following a strategic and organizational economics approach, we contribute to this literature in three ways. First, we attempt to establish a direct and clear link between human capital and corporate governance. Secondly, we contribute to the development of a more systematic approach to corporate governance effectiveness, one that is rooted in organizational economics and strategic management research streams and focusing on a key stakeholder, i.e., human capital. Finally, we propose a theory-built framework explaining various governance mechanisms that would favor or hamper investments in human capital accumulation and highlight the importance of risk sharing. The paper proceeds as follows: First, a review of the conceptual links between human capital and corporate governance is presented. Then, we delineate the most relevant attributes of human capital expected to affect governance design based on extant strategy and organizational theories of the firm. In a subsequent

section, a framework for explaining and predicting governance design based on key human capital attributes is developed and discussed. The final section concludes and offers some suggestions for future research.

2 Human capital and corporate governance

In its narrow sense, human capital refers to the knowledge, skills, and capabilities of individuals that allow them to be productive in their work assignments and thus provide an economic basis for their compensation in terms of wages, salaries and other forms of compensation or benefits (Becker 1962, 1993). In its broader sense, human capital includes the set of relationships and networks developed by employees throughout their careers (i.e., social capital) and the organizational arrangements and routines (i.e., organizational capital) that allow them to be innovative and productive over time (Wright et al. 2001; Blair 2011). This latter broader definition of human capital seems to be more in line with the strategic human resource literature (Wright et al. 1994; Lado and Wilson 1994; Wright et al. 2001) in that human capital along with the firm's internal and external systems used to deploy it in fulfilling and achieving the firm's strategies is probably the most important source of a sustainable competitive advantage (Barney 1991; Campbell et al. 2012). In this paper, we adopt this broad definition of human capital since we focus on the links and coordination mechanisms for building and deploying human capital in a dynamic setting characterized by constant, rapid, unexpected change, i.e., uncertainty, and under various ownership and control structures (Teece 1986; Ahmadjian and Robinson 2001; Ahmadjian and Robbins 2005; Yoshikawa et al. 2005; David et al. 2010; Lepak et al. 2003; Sirmon et al. 2007).

Corporate governance could be defined as the set of policies, procedures, and mechanisms outlining the roles and responsibilities and systems of "checks and balances" used by stakeholders to mitigate potential conflicts of interest in corporations/organizations, and therefore could be viewed as the coordination and monitoring mechanisms used to set and fulfill the strategic goals of the firm. Corporate governance mechanisms include the role and responsibilities of the board of directors in setting the overall strategy and vision/mission of the firm, the internal audit and compliance supervisory role of the audit committee within the board, CEO hiring and firing and compensation rules (Coombs and Gilley 2005; Aguilera and Cuervo-Cazurra 2009; Core and Guay 2010; Laporta et al. 1999; Gray and Cannella 1997). Corporate governance structures are also reflected in the ownership structure of the company stock (for publicly listed companies) and the extent of control and voting power structure of the board members, founder family members, and/or institutional investors, as well as board representation of these shareholders. At a first glance, we could argue that human capital is embedded in corporate governance mainly through board composition, experience and diversity (Marchelli and Stefanelli 2009; Dunn 2012; Cerrato and Piva 2012), CEO compensation determination as well as the audit and supervisory role of the audit committee and its associated internal control systems ((Mejia and Wiseman 1997; Laporta et al. 1999; Core and Guay 2010). However, this would be a very simplistic and narrow

view of the linkages between human capital and corporate governance and does not encompass the entire human resource function where a significant portion of the firm's value is generated. A more comprehensive assessment and examination of the nature of such links and how they could be leveraged to achieve higher performance outcomes to achieve the strategic goals of the organization/firm is needed. In following this approach, we assume that the ultimate goal in designing the most efficient organizational form (and thus governance mechanisms) is to maximize the total value of the firm where all stakeholders benefit from an increase in value and achieving the best possible outcome.³

Acknowledging that the definitions of human capital and corporate governance are both broad-based and multi-dimensional, we are faced with a complex relationship which we intend to approach from a theoretical perspective first by linking the various theories of the firm [e.g., transactions costs economics, agency theory, property rights theory (PRT), and the resource-based view (RBV)] to human capital. Second, we attempt to predict governance design based on some of the most important human capital characteristics identified from a synthesis of its links with the organizational theories reviewed.

3 Human capital attributes and organizational theories

The black box view of inputs and outputs production in neoclassical economics has been quite limited in answering questions in organizational economics and other strategy fields about the role of human capital (alone or in conjunction with other capital such as physical capital) in driving firm growth, profitability and performance, i.e., in generating and sustaining wealth. Human aspects in organizational economics and strategy literature date back to the seminal and foundational works of Barnard (1938), Simon (1947, 1982), and Cyert and March (1963), among others. The behavioral approach to the theory of the firm detailed in these works provides the foundation for today's most prominent organizational economics and strategic management theories (Mahoney 2005). In its simplest form, employees as members of an organization contribute their services, time and effort to the organization in return for "inducements" offered by the organization (Barnard 1938; Mahoney 2005). Such inducements or incentives include monetary rewards (e.g., wages and benefits) as well as non-monetary rewards such as prestige, work environment, career development and other relational capital. Although this contract-based relationship of employees to their organization seems fundamental to organizational identity, the employment contract is characterized by an *authority relationship* (Coase 1937; Williamson 1975) in contrast with arm's length

³ Although we acknowledge that rent appropriation and potential conflicts would arise between various stakeholders (namely employees and shareholders in our case), we focus our discussion in this paper on how to increase value to all stakeholders (rent generation) when human capital is explicitly incorporated in governance design. For a detailed analysis of human capital-related rent generation and distribution, see Coff (1999, 2011).

contracting such as the case of commercial contracts for services or products (Masten 1988).

Recognizing that a theory of corporate governance should be based on organizational economics foundations, we attempt to conceptualize the potential associations between human capital and corporate governance by synthesizing the most salient organizational theories in an effort to build a cohesive framework to help explain and predict the impact of certain human capital attributes on governance mechanisms design. Table 1 summarizes and compares across these theories, the most important human capital characteristics and dimensions to help build and further reinforce the proposed framework for linking human capital and corporate governance. It also highlights the major contributions and some limitations based on prior conceptual and empirical literature.

As shown in Table 1, human capital has been prominently featured in each organizational theory construct. In response to the “black box” model of production associated with neoclassical theory where labor is mixed with physical capital to create output (labor market theory could be seen as an extension of this economic branch), both agency theory, transactions-costs economics (TCT), and property rights theories adopt a more fine-grained approach to employment relationships. All of these theories follow a contractual approach and differ in the focus and contribution to governance design as it relates to human capital, at least from a theoretical perspective. For example, agency theory has been critical in specifying the types of contractual arrangements devised to minimize the agency costs of the separation between ownership and control (management compensation, director compensation and also employee compensation). Given the information asymmetries between various players (principals and agents) in the modern corporation, and given the increasing degree of task delegation, the firm as a “nexus of contracts” approach of agency theory is an appropriate foundation for governance mechanisms design. With respect to human capital, the compensation contracts and features directly impact governance and human capital policies inside a firm (see for example Mejia and Wiseman 1997; Core and Guay 2010 for a review of executive compensation literature). Furthermore, the uncertainty construct has been well developed in the positive agency theory branch where team production (i.e., input and output measurement uncertainties) capture some of the internal uncertainty associated with team-based work which could be a source of competitive advantage given its specificity, value, rarity and non-replicability (Barney 1991). The degrees of task programmability and non-separability (Mahoney 1992; Lajili and Mahoney 2006) could be used as proxies for these positive agency costs. For example, Lajili and Mahoney (2006) developed a conceptual framework for explaining and predicting organizational form under the conditions of asset specificity and uncertainty (positive agency costs) in the presence of information technology (IT) systems. They conclude that electronic integration using IT systems and depending on the level of asset specificity of both the electronic system and human capital, may decrease transactions’ costs and lead to de-integration and more reliance on relational contracts (Mahoney 1992; Kim and Mahoney 2006). Furthermore, and under conditions of uncertainty (ex-ante) risk and profit sharing contracts as a

Table 1 Human Capital and Theories of the Firm

	Agency theory (AT)	Transactions-costs economics (TCT)	Resource-based/dynamic capabilities (RBDC)	Property rights theory (PRT)	Labor markets theory (LMT)
Human capital treatment	<p>Contractual employment approach/principal-agent relationship (ex-ante and ex-post agency costs)</p> <p>Self-interested principals and agents (uncertainty effect) (e.g., Jensen and Meckling 1976; He and Wang 2009; Wang and Barney 2006)</p>	<p>Contractual approach (bounded rationality and ex-post haggling contacting costs)</p> <p>Human asset specificity “learning by doing” self-interested parties” with guile” (human uncertainty effect) (e.g., Williamson 1975, 1985, 1996; Ouchi 1980; Masten 1988)</p>	<p>Human capital as a source of competitive advantage/firm-specific and organizational flexibility (uncertainty effect) and alignment between individual and organizational goals (asset complementarities/co-specialization) (e.g., Grant 1996; Coff 1999; Coff and Kryseynski 2011; Teece 1986, 2011)</p>	<p>Incomplete contracts (bounded rationality and uncertainty effect)</p> <p>Asset specificity and ownership/access rights (e.g., Libecap 1992; Hart 1995; Asher et al. 2005)</p>	<p>Specific and general human capital differentials effects and investments in human capital (e.g., Becker 1962; 1993; Milgrom and Roberts 1990, 1995)</p>
Human capital analytical focus	<p>Focus on individual and optimal complete ex-ante incentive contracts (mathematical branch). Team production input and output measurement (positive branch) agency cost minimization focus</p>	<p>Focus on opportunism and self-interest with guile (hold-up costs). Transaction-cost minimization focus</p>	<p>Focus on tacit knowledge and organizational routines and dynamic capabilities as well as flexibility to drive organizational performance</p>	<p>Focus on property rights (residual rights of control) ex-ante and ex-post wealth distribution effects</p>	<p>Focus on individual and firm perspectives within a market framework. Investments and returns to human capital investments</p>

Table 1 continued

	Agency theory (AT)	Transactions-costs economics (TCT)	Resource-based/dynamic capabilities (RBDC)	Property rights theory (PRT)	Labor markets theory (LMT)
Major contributions	Rigorous and operational framework within the assumptions of the model. Performance-based contract terms to minimize agency costs and align employee/ employer incentives. Risk sharing and uncertainty modeled explicitly. Positive branch useful in predicting optimal governance design (e.g., Gray and Cannella 1997; Laporta et al. 1999; Mejia and Wiseman 1997; Lajili and Mahoney 2006)	Human asset specificity together with behavioral uncertainty (opportunism) helps delineate employment contracts with safeguards for both employee and employer (relevant for governance design) (e.g., Ahmadjian and Robinson 2001; Ahmadjian and Robbins 2005; Yoshikawa et al. 2005; David et al. 2010; Wang et al. 2009)	Organizational/individual alignment crucial to realizing rents from human capital investments. Need for integrating structural and social capital into strategic human resource management (e.g., Galunic and Anderson 2000; Makadok 2001, 2003; Gottschalg and Zollo 2007; Kor and Leblebici 2005; Sirmon et al. 2007)	Legal forms for protecting human capital investments (specific ones in particular) wealth creation and distributional effects explicitly recognized (e.g., Blair 1995; Mahoney 2005; Kim and Mahoney 2006)	Cost and return/productivity measurement within the market assumptions. Operational and rigorous value/cost approaches (e.g., Hatch and Dyer 2004; Mayer et al. 2012)
Limitations	Restrictive assumptions for the incentive contracting mathematical approach. Hard to measure task programmability and non-separability (team production)	Human asset specificity may be difficult to measure. Opportunism and hold-up focus may not be realistic and valid always	Lack of formalization and solid theory framework (tautological)	Legal ramifications of writing contracts based on property rights allocations and wealth distribution may be high and non-sustainable. Leads to “unstable” labor markets	Competitive and imperfect labor market structures lead to restrictive assumptions and “aggregate” results

governance solution have received considerable attention in the agency theory framework (Brouwer 2005; Grandori 1997; Gray and Cannella 1997).

While agency theory focuses more on ex-ante information asymmetries between the contractual parties (for example between employees and shareholders) and positive agency costs, TCT is more concerned with ex-post contracting costs, and in particular opportunistic and behavioral uncertainty related to the contract (employment contract) execution and sustainability. In this sense, TCT offers a framework for selecting optimal governance design based on the minimization of labor-related transactions-costs (Foss 2011). Human asset specificity and uncertainty are two major attributes upon which a theory of human capital governance could be built. Human capital specificity refers to the degree to which skills knowledge and experience accumulated by employees is firm-specific or industry-specific and should be distinguished from generic (or general) human capital. The specificity of human capital is an important attribute identified in prior organizational and strategy literature (Wang et al. 2009; Sturman et al. 2008; He and Wang 2009). For example, Wang et al. (2009) show that firms with greater firm-specific knowledge resources are more likely to adopt governance mechanisms that motivate employees such as employee stock options and relational governance and reduce key employees' concerns about hold-up by the firm. Incentive alignment and the reduction of potential hold-up are important in designing governance mechanisms particularly in highly innovative and dynamic industries (He and Wang 2009). Most of this literature combined elements from transactions costs theory, agency theory, resource-based/dynamic capabilities approaches. The complexity of human capital specificity as it interacts with uncertainty at the individual, firm, industry and global levels and other production assets (e.g., complementary assets) to create and sustain comparative advantages suggest that a comprehensive and integration of organizational theories is warranted (David et al. 2010; Ahmadjian and Robinson 2001; Yoshikawa et al. 2005). Prior research in corporate governance and firm performance with respect to employment policies examined for instance the extent to which foreign ownership affects the stability and effectiveness of governance structures based on the stakeholder view of the firm in comparison to the shareholder-based view (Ahmadjian and Robinson 2001; Ahmadjian and Robbins 2005; Yoshikawa et al. 2005). Using samples of publicly-listed Japanese firms that downsized their workforce in the financial crisis of the 1990 s, these studies found that increased foreign ownership of Japanese firms by foreign institutional investors during that period influenced to a certain degree the decision to downsize and restructure. However, the degree of influence was limited by the strong governance networks existing between domestic owners, financial institutions and business groups. Furthermore, Ahmadjian and Robinson (2001) found that the higher the level of human capital specificity in Japanese firms reduced the likelihood of downsizing while the increased use and dependency on foreign capital further increased it. These studies clearly show that whenever a conflict of interests exists between several stakeholders and particularly under conditions of high uncertainty (such as the financial and economic crisis in Japan in the 1990s), governance mechanisms will adjust to rebalance the needs, power and interests of each stakeholder group (David et al. 2010). Following this line of research, this paper

attempts to shed more light on the theoretical conditions for certain governance mechanisms to emerge as a response to interdependencies between human capital specificity, uncertainty and asset complementarities.

Property rights theory and in response to both agency and transactions-costs theories, emphasizes the legal aspect of governance as it focuses on defining the residual rights of control that have been contracted away in the employment relationship. For example, who holds the residual rights of control over research and development patents or innovative processes in a high-technology or a pharmaceutical company? With respect to human resources, firms hold property rights over the physical resources and other intangible assets (such as patents, reputation, and organizational capital) but employees hold the residual rights of control over their human capital unless explicitly specified in the employment legal contract. These asset complementarities are critical in defining and supporting firms' operations and the creation and sustainability of any competitive advantage linked with human or knowledge capital (Teece 1986; Milgrom and Roberts 1990; Kor and Leblebici 2005). The degree of co-specialization or specificity applied to the bundle of human and other intangible or tangible capital inside the firm has important implication for the design of efficient and value-maximizing governance structures and will be highlighted in our proposed framework below. Human assets are usually bundled with physical assets (co-specialized or complementary assets) to create firm value and generate rents (e.g., a research scientist in a pharmaceutical firm or at a university research centre and the laboratory he/she works at, insurance agents and customer files, IT engineer and management information systems specific to a particular company such as IBM). Employees cannot be "owned" by their employers since employees can leave the firm at will, however, employers usually have residual rights of control over the complementary assets (tangible and intangible such as patents) which gives them leverage and ultimately control over human assets (Hart 1995; Mahoney 2005).

The RBV with its dynamic capability focus also provides solid theoretical background for examining human capital as a critical asset and potential source of competitive advantage particularly when embedded in tacit knowledge and firm-specific organizational routines and dynamic capabilities (Nelson and Winter 1982; Teece 1986, 2011). Increasingly, the RBV of the firm is extended by considering more dynamic contexts and capabilities management and joining the strategic human resource management research stream to examine in more detail the role of human resource systems and policies in creating and sustaining firm comparative advantages & Krzycynski (e.g., Coff and Krzycynski 2011; Kor and Leblebici 2005; Wang and Barney 2006; Mayer et al. 2012; Skaggs and Youndt 2004; Lepak et al. 2003).

Finally, the labor markets theory research stream directly contributes to human capital-based literature by examining and testing various assumptions about the measurement and management of different kinds of human capital in terms of specificity, namely firm-specific versus general human capital (Becker 1962, 1993). Measuring the costs and values/returns attached to investments in human capital and their potential impacts on firm and market performance are necessary to support any governance mechanism design and policies geared towards leveraging human

capital for creating and sustain comparative advantages (Galunic and Anderson 2000; Sturman et al. 2008; Hatch and Dyer 2004; Mayer et al. 2012; Lajili and Zéghal 2006).

In summary, and as presented in Table 1, the various organizational and strategy theoretical streams reviewed in this section suggest that given the complexity of the human capital questions especially with regard to efficient and effective corporate governance design, an integration of the common human capital attributes, work organization and governance contracts and structures, is warranted. In the following section, we propose a governance design framework based on human capital attributes and prior organizational literature.

4 A governance design framework based on human capital

As shown in Table 1, the main common human capital threads include human capital heterogeneity (i.e., the degree of specificity of human capital⁴) asset complementarities and degree of co-specialization, and the effect of uncertainty defined in broad terms to include behavioral uncertainty such as bounded rationality, opportunism, adverse selection and moral hazard, team production measurement (i.e., internal uncertainty) as well as environmental and market uncertainty such as demand and supply in product and factor markets. In Table 2, we develop a conceptual map/matrix to further highlight the expected governance outcomes most likely to emerge from the interaction of these key human capital attributes. Each cell of this table proposes the type of organizational form expected to prevail in those conditions as well the human capital investment, compensation and rewards structure associated with those forms. For example, in a high uncertainty, high human capital specificity case, firm governance is expected to be the optimal choice of organization where high investments in specific human capital training and overall strategic human resource management systems are critical and thus ideally embedded in the corporate culture and governance/strategy of the firm. Contractual safeguards may be needed to minimize hold-up problems through an efficient distribution of decision and control rights, compensation and reward structures and overall employee/organization alignment of interests.

This simple governance framework combines human asset specificity, uncertainty (both of the internal and external types) and the extent of asset complementarities to propose a governance mode that would best accommodate human capital leveraging in modern corporations. It thus maps different human resource policies as they relate to building and investing in human assets to different human capital governance design including hierarchy (or firm governance), contract-based governance (e.g., outsourcing and/or off shoring) and market-based (or arms' length)

⁴ The degree of specificity of human capital in term of task idiosyncrasy (Williamson 1975, Foss 2011) and/or specialized skills and organizational routines, relationships and socially complex networks (e.g., Coff 1997, 2011, Wright et al. 2001, 2007). Prior research shows that firm-specific, industry-specific and occupation-specific human capital are all valuable to firms particularly under conditions of "thin markets" and mobility in the labor market such as executive management positions (Sturman et al. 2008, Hatch and Dyer 2004, 2012).

Table 2 Governance design and human capital attributes

		High uncertainty (internal/external)	Low uncertainty (internal/external)
High asset complementarities	High human capital specificity	<i>Firm governance with high flexibility and adaptability (e.g., dynamic capabilities, real options)</i>	<i>Firm governance/partnership mode</i>
		High bundling of human and other assets	Profit sharing based
		Performance-based rewards (e.g., stock options, bonuses...)	Safeguards against opportunism/medium bundling
	Low human capital specificity	Safeguards against opportunism	Firm Investments in training and development
		High specific training and team-based work approach	
		(1)	(2)
Low asset complementarities	High human capital specificity	<i>Firm governance</i>	<i>Firm governance (or strategic alliances)</i>
		Collective bargaining/unions	Fixed salary/market-based
	Training shared by both employer and employee	Training shared by both employer and employee	
	(3)	(4)	
Low asset complementarities	High human capital specificity	<i>Relational Contract governance with medium term duration</i>	<i>Relational contract with long term duration</i>
		Low bundling	Low bundling
		Competitive wage/reward structure (ongoing negotiations and bargaining between employer and employees)	Market-based wage structure
		Relationship-building and joint ventures/alliances	Training partly covered by employer (only firm-specific)
	Low human capital specificity	(5)	(6)
		<i>Market-based labor contracts with short to medium duration (outsourcing, off shoring)</i>	<i>Market-based labor contracts with medium to long-term duration</i>
		Unbundling	Unbundling
		Market-based wage determination	Market-based competitive wage structure (low-cost focus)
	Training costs borne by employee mainly	Not a source of human capital-based competitive advantage	
	(7)	(8)	

employment contracts. In the following section, we present and discuss each cell in Table 2 and give some industry examples to illustrate and support the arguments advanced.

4.1 High asset complementarities case

Cell (1) on Table 2 describes a situation where asset complementarities between human capital and other firm assets (physical, intellectual, organizational, or other) are high. In addition, human capital firm specificity is high suggesting that the firm has an idiosyncratic process for developing and deploying its workforce such as for example a unique production process and machinery/equipment on which employees have to receive particular/firm-specific training (Hatch and Dyer 2004; Wang et al. 2009; Sturman et al. 2008). The combination of high asset complementarities and human capital asset specificity leads to a high degree of “co-specialization” (Teece 1986; Milgrom and Roberts 1990, 1995). Based on the RBV and the transactions-costs approaches, a firm/hierarchy-type of governance mode is predicted for this case scenario to help create and sustain a competitive advantage (Barney 1991; Coff 1997, 1999). Furthermore, and given that both internal and external environmental uncertainties are high in this case, firms operating in such business environments will have to increase their flexibility, adaptability and manage risks (both internal and external) in an efficient and effective way. Developing “dynamic capabilities” and using real options would help companies cope with such high uncertainty (Teece 2011; Wang and Lim 2008). Examples of such business environments could be the rapidly changing high-technology, computer and telecommunications, software, as well as the pharmaceutical and biotechnology sectors. The high degree of asset complementarities, firm-specific human capital investments and high uncertainty are typical of these sectors. For example, companies such as Apple, Google, Microsoft, and Facebook operate in fast changing consumer preferences and technological environments where the competition and innovation by rivals is fierce (external uncertainty). Furthermore, competition is heightened by rivals in acquiring, training, and retaining specialized talent in these industries willing to adapt and work in team environments to speed innovations and capture market share. Managing their human resource system to lower turnover and the loss of key employees becomes a strategic priority (managing operational risk or internal uncertainty). How should firms embed strategic human resource management into the governance design in firms in these sectors?

The goal being to increase the total value of the firm and realize the potential efficiencies from optimal organizational structures in line with the RBV and the transactions-costs approaches (Williamson 1996; Mahoney 2005), a governance design would include guidelines on board composition, monitoring, internal controls and public disclosure mechanisms, incentive alignment mechanisms (Jensen and Meckling 1976; Ouchi 1980) as well as ownership structures (Rajan and Zingales 1998; Blair 2011; Ahmadjian and Robinson 2001; David et al. 2010).

Linking governance mechanisms to human capital attributes for cell (1) on Table 2 suggest that firms characterized by high asset complementarities, high

human capital specificity and operating under high internal and/or external uncertainty would opt for flexible and innovative ways of organizing their strategic human resource function. To give incentives for their employees to invest in firm-specific human capital for example, share ownership and other long-term incentives should be part of the employee compensation package and monitoring mechanisms could be relaxed (He and Wang 2009). By bundling specific human capital with physical or other intangible assets, the firm effectively holds residual rights of control (Hart 1995). This bundling of co-specialized assets contributes largely to the competitive advantage creation and sustainability of the firm. Both employers (firms) and employees are “locked-in” in a relationship-specific investment which could be a source of opportunistic behavior on either party (Williamson 1985, 1996). The governance mechanisms should focus on incentive alignment and protection of mutual benefits particularly under high uncertainty. Participation on boards by key employees, empowering employees to design and lead projects based on their creativity and collaboration with their fellow colleagues, share ownership and other incentive compensation, as well as work-life balance trade-offs and policies would help to keep both parties in the “coalition” to realize the gains. For example, some companies are creating innovative ways to organize internally their tasks and work contributions by eliminating management positions across the firm and empowering their employees while building strong collaborating teams and organizational assets.⁵ This new human resource management trend could be seen as a governance response to dynamic, uncertain and innovative environments coupled with highly specific human capital building and intellectual property rights required in software and entertainment industries particularly in small to medium size players in this space.

Cell (2) on Table 2 describes the case of high asset complementarities, high human capital specificity and low uncertainty. Co-specialized assets are favoring bundling to take advantage of the uniqueness and scarcity of these resources for the creation of a sustainable competitive advantage. Firms in this case are assumed to be operating in a low uncertainty environment such as a stable demand and predictable competitor actions. Large and widely diversified financial firms in North America for example could illustrate this cell on Table 2. Despite the high level of regulation faced by these firms particularly in the wake of the latest financial and global crisis, the largest and most diversified (low operational risks firms) could manage the turbulent external environment during this period. For example, despite its close ties with other troubled financial institutions during the crisis and their global connections, Bank of America in the US and Royal Bank of Canada managed to survive and continue to enjoy their leadership positions in the banking sector after the crisis. Other less diversified financial firms in investment banking with more concentrated portfolios in mortgage-backed securities and high-risk trading activities (high operational risks/internal uncertainty) such as Lehman Brothers went bankrupt although it had high human capital specificity and complementary organizational and reputational assets. These highly concentrated firms/industries

⁵ See for example the blog by Erik Sherman titled “*Could Your Company Manage without Managers?*” August 15, 2013.

could then fall into cell (1) of the conceptual map in Table 2. Large, high reputation and diversified professional services firms combining for example accounting and financial and legal services for their customers could also be represented by cell (2) such as fig-4 accounting firms. The partnership governance and employment model could be used in this case. The closely held or private ownership of partnership firms allow for better control over investments in high human capital specificity and bundling with other intellectual capital such as reputation, advertising, and organizational complementary assets. Focusing on incentive/profit sharing compensation, autonomy for key employees to carry out their tasks and investments in firm-specific human capital such as internal electronic communication platforms (e.g., B2E intranet) and other relationship-specific investments (Lajili and Mahoney 2006), this governance solution allows for rents distribution and internal control within the partnership based on agreed upon conditions (e.g., property and residual rights of control). It could be seen as a response to a market failure in managing highly specific, co-specialized human capital (Williamson 1975, 1985, Mahoney 2005).

Cell (3) on Table 2 could describe the auto-manufacturing sector and the airline and aerospace industries in North America for example. Asset complementarities are high but the level of human capital specificity is not necessarily high (i.e., interchangeable employees or high automation of the production process in the auto and aerospace sectors for instance). The high uncertainty condition in this cell could reflect competitive pressures, unstable demand, changing technology, environmental or regulatory shocks. In this case, we predict firm governance with multi-stakeholder bargaining such as unions, suppliers, as well as investors (Ahmadjian and Robinson 2001; Ahmadjian and Robbins 2005; David et al. 2010; Yoshikawa et al. 2005). This is an interesting case to study in terms of the role of human capital in governance design in the future. For instance, in the US, the solution seems to be to negotiate with multiple stakeholders with some shocks and unstable outcomes (e.g., the bailout of the big three automakers in the US during the last financial crisis) while in some other countries such as Japan and Germany, the governance solution centered around including employees in the governance through the 2-tier board and co-determination structure. Recently, Boeing, the US aircraft company, has been in the news with its machinist union workers in Seattle negotiating an extension/renewal of their employment contract with concessions with regards to their pensions moving from traditional defined benefit plans to contribution benefit plans. To increase its competitiveness and strengthening its position globally, Boeing was ready to move the production of the carbon wings of its aircraft 777 to other states such as Alabama and North Carolina (showing that the degree of specificity of human capital and location are not relatively high) if no contract is approved by the union's vote. The vote eventually passed with thin margins.⁶ This example shows the balance of power and control between a large aerospace company and its employees particularly in high uncertainty and higher supply of labor and other incentives to build and hire in states/regions other than the

⁶ The full story and comments about Boeing and its machinist union labor contract negotiations can be found at <http://www.pbs.org/newshour/bb/business-jan-june14-boeing> 01-03 among other news outlets.

traditional ones. It further shows that human capital governance attributes are not static in time and do evolve from high to low specificity following changes in technology, business cycles, economy and regional development and tax incentives (i.e., a dynamic setting). Therefore, the conceptual map proposed in Table 2 assumes that some industries and occupations can move from one cell to another if certain conditions in uncertainty, human capital specificity and asset complementarities change over time.

Finally, cell (4) depicts a low uncertainty, low specificity but high asset complementarities. Given the lack of firm specificity in this case and the low level of uncertainty, firms may not have any competitive advantage derived from human capital. In this case, we argue that a market-based wage determination with some sharing of the costs of human capital investments is warranted. An example of industries operating under such a combination could be the regulated and/or governmental sectors such as education and utilities; branded and concentrated food industries (such as Kraft, Campbell Soup, and big breakfast cereal makers in the US); and public transportation companies, where human capital is general rather than highly specific, and demand for the product/service is stable and continuous (i.e., inelastic to a certain extent).

4.2 Low asset complementarities case

Cells (5) through (8) on Table 2 refer to the interactions of low asset complementarities with the levels of human capital firm-specificity and the extent of internal and/or external uncertainty. Cell (5) refers to a situation where employees develop firm-specific skills and abilities but could be relatively easily “unbundled” from the firm’s asset mix. This could describe for example a University Professor who becomes the Dean of its faculty or school or a different university. The high uncertainty condition could refer to causal or performance ambiguity (Ouchi 1980; Rumelt and Lippman 2003; Coff 1999) thus internal uncertainty in addition to any environmental uncertainty (for example a shortage or unavailability of certain human capital skills, regulatory changes) could lead to employee turnover risk. Professional and management consulting firms (usually small to medium size) and entrepreneurial or start-up firms could fit into this quadrant (cell 5). Teece (2011) distinguishes between “intrinsic talent” and “contextual talent” where the former refers to the value human capital would create without the support of complementary assets from the firm such as a firm brand or a platform or IT system owned by the firm. The latter would characterize a talent that is enabled and would lead to higher value in the context of a particular brand or firm such as organizational or reputational capital. In this case, managing talent and particularly intrinsic talent leads to a flexible and more employee-friendly governance system with relational or psychological contracts with both monetary and non-monetary components in incentive compensation and less monitoring are warranted. Reducing the risk of turnover because the firm-specific component of human capital is weakened by the low asset complementarities in the business model is a priority to help create and sustain any human-capital based competitive advantage in this case. For example, in sports franchises, hockey or soccer professional players could switch from one team

to another and command higher compensation/contract due to their highly specific and sought after performance and talents. Due to high uncertainty (both internal and external), most often, medium term renewable employment contracts and negotiated high performance-based compensation characterize such a situation.

Cell (6) is similar to a large extent to cell (5) but because of the low uncertainty condition, it suggests that the relational contract could be of a longer duration given the lower degree of external and internal uncertainty. High-end branded fashion design firms rely on talented employees and a stable and loyal customer niche. Their positioning and product differentiation command a premium on the products/services they offer and thus joint ventures or relational contracts (e.g., vertical network organizations or VNO) between the various suppliers, retailers and customers could be devised and sustained over a generally long period of time (Ouchi 1980; Lajili and Mahoney 2006).

Finally, cells (7) and (8) depict situations where the low human asset specificity combined with low asset complementarities would favor a market-based employment contract including outsourcing and off shoring solutions to compete on low cost human resources. The duration of the contracts depends on the level of uncertainty and in particular external or environmental uncertainty (e.g., market demand, technological shocks...etc.). These human capital attributes suggest that no competitive advantage could be created through human capital investments or embedding human capital into governance design and strategy formulation but rather the low-cost approach to sourcing general skills and abilities and the speed with which firms could reconfigure and divest or acquire their human resources would ultimately determine their survival. Examples of industries for cell (7) are self-employed trades in construction or infrastructure industries, real estate brokers and retail sales employees. Cell (8) depicts pure market-based wages that could be easily outsourced to the lowest cost regions. Amazon's web-based platform called "Mechanical Turk"⁷ for matching jobs and/or tasks with suppliers (workforce) and users (employers) is a case in point. This web-based platform allows job seekers and job suppliers to connect quickly, efficiently, and effectively. It is well-suited for general, widely available and common jobs. In that sense, market-based governance and the price/wage discovery process works well for this type of general human capital.

5 Discussion and conclusion

The current paper develops a governance-based approach where human capital investment and capability building are core elements to help to explicitly and systematically leverage this critical asset in the future. Our contributions in this paper are two-fold: First, we delineate the role that human assets play in prominent governance and firm theories in the strategy, organization and labor markets literatures. Such an analysis helps to highlight the various components of the human asset governance question which have been addressed by some theories but

⁷ The website for Amazon's workplace distribution platform is: <https://www.mturk.com/mturk/welcome>.

neglected by others. For example, in TCT human capital has approached both asset specificity and uncertainty dimensions with a focus on costs while in AT, asymmetric information, task programmability and team production input and output measurement (i.e., internal uncertainty or causal ambiguity (Coff 1997, 1999; Ouchi 1980) lead to a focus on compensation contracts and incentive compatible theoretical solutions. An integration of the common threads within these organizational and economic theories with regards to human capital helped to delineate the most important attributes or characteristics of human capital that are believed to significantly impact corporate governance design as it embeds human capital and strategic human resource systems in the future. These human capital attributes consisted of asset specificity, uncertainty and the degree of asset complementarities (i.e., physical and human capital investments).

The second contribution of the current paper consists in the development of a framework that address the creation, distribution and sustainability of human capital-based competitive advantages and the governance mechanisms needed to support them. The framework combines the human capital attributes, namely, human asset specificity, uncertainty (both of the internal and external types) and the extent of asset complementarities to propose a governance mode that would best accommodate human capital leveraging in modern corporations. It thus maps different human resource policies as they relate to building and investing in human assets to different human capital governance design including hierarchy (or firm governance), contract-based governance (e.g., outsourcing and/or off shoring) and market-based (or arms' length) employment contracts.

Some suggestions for future research include empirically testing and validating the conceptual framework proposed in this paper. For example, various firms with different human resource strategies could be examined to shed more light into the impact of human capital investments and capability building on the governance choice and particularly on the way human capital is managed and leveraged to create and sustain a competitive advantage. Both quantitative and qualitative methodologies could be used to shed more light on the relationships between human capital specificity, uncertainty/risk, and asset complementarities in the optimal design of governance mechanisms (Crook et al. 2011; Wang et al. 2009; Canonico et al. 2013). There is a certain degree of endogeneity and causality between governance design and human capital attributes. The latter affects governance mechanisms design (i.e., the main argument held throughout this paper) but we also recognize that governance design can also impact human capital attributes. For example, the degree and incentives for a firm to invest in firm-specific human capital given a high degree of external or environmental uncertainty will directly impact the extent of human capital asset specificity and related investments (e.g., employee training and development) inside the firm. Empirical studies could test of the presence and impact of such causality effects and endogeneity problems between human capital attributes and governance design in future research. Also, further investigation of how specific and general human capital (together or separately) contribute to firm value and how firms can leverage both types to generate rents is worthy of more research attention in the future. Governance structures that include more employee involvement and board representation (i.e.,

stakeholder governance) could be compared to other systems, namely the Anglo-Saxon model of shareholder-based governance where such representation does not usually exist and shareholders tend to have more control over managerial decisions, allocation of resources and investments (e.g., two-tiered vs. one-tiered governance systems). The influence and impact of globalization and changes in equity ownership structures around the world suggest that conflicts of interests between various stakeholders, namely providers of capital or shareholders, management and employees (David et al. 2010; Ahmadjian and Robinson 2001) will persist. Future studies could examine more closely the impact of ownership structure on investments in human capital as it interacts with other complementary assets and under conditions of uncertainty following this paper's conceptual framework. Institutional, social and cultural considerations with regards to human capital have to be explicitly modeled and recognized in international studies testing the proposed framework (Aguilera and Jackson 2003; Yoshikawa et al. 2005). Finally, a thorough investigation is needed to understand how human capital interacts with other organizational assets and how its contribution to corporate success and rent-generating potential could be figured out by "unbundling" it. If complementary specialized physical or other intangible capital (such as brands) cannot be unbundled from human capital, the governance structures that would balance and best manage these combinations will outperform their peers. This paper attempts to systematically and explicitly examine the role that human capital and its various attributes play in selecting efficient and value-maximizing governance structures by integrating various organizational theories with regards to human capital in prior literature. It represents a first and necessary step towards embedding human capital strategies and organizational change and development (i.e., a dynamic capability building view) into optimal governance design.

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