

***Intangible Assets, Innovation Capability and Performance, A Comparative Analysis of the Textile and Apparel Industry of Sri Lanka***

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**ABSTRACT**

*The purpose of this paper is to exhibit the intangible assets influence on firm innovation and performance by constructing the relationship based on the three components of intellectual capital: namely human, organizational and social capital of the Textile & Apparel industry in Sri Lanka. The shift of the traditional tangible assets such as land, facility, work force, physical and financial capital which are considered as genuine capital, towards more subtle forms of intellectual capital creates a crucial factor for the achievement of innovation and firm performance. This paper investigates the multidimensional and contingent gradual effect of intellectual capital on innovation capability and firm performance. The convenient sampling technique was used for data collection in Sri Lanka. Structured questionnaires were administered as a research instrument to collect data from the executives and managers. The results reveal that the components of intellectual capital have significant positive relationship on innovation capability and firm performance. The findings of this research will be useful for the Textile & Apparel Industry to understand and apply intellectual capital management to create innovation in their organizations.*

**KEYWORDS:**

*Intangible Assets; Innovation capability; Firm performance; Organizational motivation*

**1. INTRODUCTION**

The importance of intangible assets known in different ways in the literature, such as intangible resources, intellectual capital, intangibles, intellectual property are the distinguishing features of the new economy. As economies are becoming knowledge- and technology-based, the intangible elements of firms are becoming fundamental determinants of firm current and future competitiveness as well as firm innovation and performance. Intellectual capital is the value driver of an enterprise and the most valuable of assets. It currently

constitutes between one-half and two-thirds of corporatemarket value of economy from last two decade's enterprises (Lev, 2001).

In a global knowledge-based economy, the issue of why some firms are more innovative and perform better than others is likely to be a crucial one. This question is in the centre of analysis of many business disciplines and the subject of never-ending debate (Sivalogathan & Wu, 2013). The deployment of superior resources leads to innovation capability of the firm, which as a consequence is expected to result in superior performance (Fahy and Smithee, 1999). In particular, intangible assets are considered to be the most important source of firm innovativeness and heterogeneity of performance because of relatively high barriers to duplication (Hall, 1992). But intangible assets contribute to firm innovativeness and better performance, could the lack of them explain firm??? On the other hand, the Dynamic Resource-Based View (Wernerfelt, 1984, Barney, 1991, Helfat, 2000, Helfat and Peteraf, 2003) and the Dynamic Capabilities Approach (Teece, Pisano and Shuen, 1997) while explaining how firms gain innovation capability and better performance, it is increasingly demanding environment dynamics, evolution of resources, and capabilities.

In this new economy, the traditional sectors like the textile & apparel industry in order to increase innovation and competitiveness to survive in global economy need to change from labor-intensive to knowledge-intensive production and focus on new products with more value-added, and therefore need to make constant investments in intangible resources (Owen, 2001). The new innovation capability and competitive landscape emphasizes flexibility and speed in responding to fast-changing environments. Many textile & apparel firms fail since they are not able to win a price competition and they do not change the traditional way of doing a business (Wu & Sivalogathan, 2013). In order to survive in the global economy firms need to focus on quality, brand, high-specialized products, reputation, and attractive design and need to establish cooperative links with science in an innovative way. Although the importance of intangible assets for present and future of this industry is strongly emphasized, in this field, very few of the identified studies have been conducted to investigate and compare this important issue in the textile & apparel industry.

### **THE TEXTILE AND APPAREL INDUSTRY IN SRI LANKA**

Today the textile and apparel industry has become one of the largest income-generating avenue in the country. In fact the textile & apparel industry

is one of the most lucrative foreign exchange earnings for the Asian region. It has contributed to 52% of the country's export earnings. In addition to that the industry directly employs nearly 300,000 people as workforce all over the country. There are 830 garment factories of which 157 are small, 438 - medium, and 235 - large scale factories(BOI, 2012).The industry spreads around the country & a number of factories can be seen operating in every district in the country including the Northern and Eastern Provinces. The significant character of this industry is 65% to 95% young women employees are being employed as workforce (ILO, 2001). Talking about textile and apparel industry, it uses low technology & it can be described as being a labour intensive industry (Perera, et al 2008). Thus, it is also the highest employing sector in the economy of the country. The apparel industry is labour intensive industry, so individual behavior & attitudes of these industry workers are very important to identify. Especially in the manufacturing industry, the labour is the crucial input (Datta et. al, 2003).

In the textile and apparel industry from the very beginning Sri Lanka's comparative advantage remained the low cost. Since the industry was under quotas for about 30 years most of the Sri Lankan manufacturing organizations have not taken steps in building their own competitive advantage in order to differentiate themselves from the competition. However when looking at the present scenario with the removal of quotas Sri Lankan textile and apparel manufacturers should adopt differentiation strategy where they should focus on delivering a product which is different from other similar category products produced by competitors.

## **2. RESEARCH OBJECTIVES**

The Sri Lankan textile and apparel industry being the largest contributor to the Sri Lankan economy for last few decades, should cultivate its competitive advantage in order to be sustainable in the global textile and apparel market. Therefore, the research question is "To what extent do intangible assets and organizational motivation influence, as critical success factors. the innovation capability of the firms, resulting to firm performance".

Firstly, the key problem investigated in this research is whether innovation capability and firm performance are enhanced by intangible assets and which is more important for firm performance. Further, the proposed research will focus on the textile and apparel industry in Sri Lanka. The primary objectives of study are:

- To examine the Intangible Assets(IC) and Organizational Motivation (OM) as critical success factors in Innovation capability (InC) and Firms performance (FP) of the Textile &Apparel Industry in Sri Lanka.
- To examine the influence of Organizational Characteristics (Och) on Intangible assets, Organizational Motivation and Innovation Capability & Firm Performance.
- To analyze the mediate effect of Organizational Motivation between intangible assets and Innovation Capability.

### **3. LITERATURE REVIEW**

Intangible assets are complex constructs which can be classified into human, organizational, and social capital (Stewart, 1997, Bontis, 1998). While all three dimensions are sources of firm innovation capability and firm performance, they are not equally important. The theoretical considerations indicate that human capital is central to intangibles since it is the source of innovation and renewal (Stewart, 1997). However, the empirical research shows mixed results. For example, Bontis (1998) found that human capital without the support of organizational capital is practically useless. Li and Wu (2004) confirmed the more important role of organizational capital for firm performance. On the other hand, Wang and Chang's (2005) study found the human capital as the most crucial component. Still more empirical research is needed to investigate the importance of different intangibles categories for innovation capability and firm performance (Kaufmann and Schneider, 2004). In this context the challenge appears to investigate the importance of different intangible assets dimensions for firm innovation capability and firm performance.

In general the studies prove the main contention of the resource-based view – positive relationship between intangibles and firm performance (Bontis, Keow and Richardson, 2000, Riahi-Belkaoui, 2003, Li and Wu, 2004, Delios and Beamish, 2001, Chen, Cheng and Hwang, 2005). Different dimensions of firm current and future performance are considered, like survival and profitability (Delios and Beamish, 2001) or firm's market value and financial performance (Chen, Cheng and Hwang, 2005). Basically all studies indicated as a future avenue of research the need to carry out similar research in other industries and countries in order to show if the link between intangible assets and performance can be generalized. In addition, Firer and Williams (2003) suggested that associations between intangible assets and performance could

be investigated across time. Riahi-Belkaoui (2003) pointed out the need of applying different measures of intangible assets.

### **INTANGIBLE ASSETS, INNOVATION AND PERFORMANCE**

The economic importance of intangible assets has long been recognized. However, it has only recently begun to be researched. Intangible assets research is strongly grounded in practice (Petty and Guthrie, 2000). Early research on intangible assets focused extensively on their definitions and classifications. Consequently, in the literature neither one unified definition of intangible assets nor one general classification can be found. For example, Stewart (1997) illustrated intangibles as the sum of an organization's patents, processes, employees' skills, technologies, information of customers, suppliers, and old-fashioned experience. The very common view is that intangibles are contained in the difference between the market and book value of the firm.

Regarding contemporary classification schemes of intangibles, Sveiby (1997) divides intangibles into three groups: (1) employee competence (individual's ability to act in a wide variety of situations to create both tangible and intangible assets); (2) internal structure (patents, concepts, models, computer and administrative systems, ex. organizational structure or spirit); (3) external structure (relationships with customers, suppliers, brand names, trademarks, organizational reputation and image). Another classification scheme divides intangible resources into assets and skills (Hall, 1992). The widely accepted classification of intangible assets is the distinction between human capital, organizational capital and social capital (Stewart, 1997, Bontis, 1998). This classification will be applied for the purposes of the research.

Human capital represents the individual knowledge stock of an organization as represented by its employees (Bontis, Keow and Richardson, 2000). It comprises the competence, skills and intellectual agility of the individual employees (Roos, Bainbridge and Jacobsen, 2001) and it cannot be owned by the company (Bontis, 2001). It is considered to be the most important intellectual asset as it is the source of innovation and renewal (Stewart, 1997).

Firms, in order to share knowledge, need structural assets, such as information systems, laboratories, competitive and market intelligence and management focus (Stewart, 1997). Organizational capital is everything that gets left behind at the office when employees go home. On the contrary to human capital, organizational capital belongs to organization as a whole and it can be

reproduced and shared. Organizational capital is a critical link that allows intellectual capital to be measured at the organizational level of analysis (Bontis, Keow, Richardson, 2000).

Social capital of the firm is the value of its franchise, its ongoing relationships with people or organizations to which it sells (Stewart, 1997). The main content of social capital is the knowledge of marketing channels and customer relationships (Bontis, 1998). Social capital is more often measured and counted than human and organizational capital. The ultimate form of social capital is shared knowledge (Stewart, 1997).

This study treats intangible assets as holistic construct (takes into account all of its different aspects rather than focusing on three dimensions) but examines its different aspects separately since different forms of intangible assets may have different implications for enhancing motivating factor. A firm's capacity to develop and apply its expertise and knowledge is highly related to its intangible assets. The most commonly given definition for intangible assets delineates this concept as the overall knowledge and capabilities that an organization can use in order to achieve a competitive advantage (Nahapiet and Ghoshal, 1998; Stewart, 1997; Youndt et al., 2004). Edvinsson (2003) described intangible assets simply: that is the pillars of the future of any enterprise; it's an indicator of whether an enterprise can operate effectively. Any enterprise that does not invest in invisible capital cannot possibly generate the momentum of innovation (Shu-Hsiao Tsen and Hsiang-Ling Hu, 2010). Therefore, we hypothesize that:

***Hypothesis 1:** Intangible assets of firm have positive and significant effect on innovation capability and lead to organizational performance.*

***Hypothesis 1a:** Human capital of firm has positive and significant effect on innovation capability and organizational performance.*

***Hypothesis 1b:** Social capital of firm has positive and significant effect on innovation capability and lead to firm performance.*

***Hypothesis 1c:** Organizational capital of firm has positive and significant effect on innovation capability and lead to organizational performance.*

#### **INTANGIBLE ASSETS, MOTIVATION AND INNOVATION CAPABILITY**

Viewed in combination, the effects of Intangible assets on Innovation capability and firm competitive advantage should be mediated by organizational

motivation of internal and external factors. This argument is consistent with the work of Zahra and George (2002) who claim that firms that focus extensively on learning from and exploring the environment can constantly renew their knowledge stock but cannot benefit from it unless they can exploit what they have learned from their environment. Similarly, in his seminal work on the role of exploration and exploitation in organizational motivation, March (1991) notes that Adaptive systems that engage in exploration to the exclusion of exploitation are likely to find that they suffer the costs of experimentation without gaining many of its benefits. They exhibit too many underdeveloped new ideas and too little distinctive competence. Therefore, the absorptive capacity theorists suggest organizational motivation should play a mediating role in the intangible assets and Innovation capability lead to firm competitive advantage and performance relationship. Although motivation in itself can lead to greater levels of Innovation capability, its real impact may depend on the extent to which there are individuals who are capable of exploiting the acquired knowledge, organizational norms for sharing and exchanging knowledge within the organization, and systems and structures in place for storing and withdrawing information in the organization.

*Hypothesis 2: Intangible assets and Organization Motivation of firm has positive and significant influence on innovation capability and organizational performance.*

*Hypothesis 2a: Organizational motivation will mediate the relationship between Intellectual capital and innovation capability lead to organizational performance.*

### **INTANGIBLE ASSETS, ORGANIZATIONAL CHARACTERISTICS AND INNOVATION CAPABILITY**

Several firm-level variables that can potentially affect the outcomes of this study were used as moderate variables. Firm size was measured as the total number of employees of the operation. Firm age was measured as the age when the firm was originally established in. Presence of an upstream value activity was measured by combining two items which asked about the firm status and the employee involvement in the business process. Numerous organizational factors beyond intangible assets may influence innovative capabilities. For example, large organizations may be more likely to develop innovative capabilities owing to their extensive resource bases (Henderson & Cockburn, 1994); however, smaller organizations may be more innovative owing to their flexibility (Cohen, 1995). Thus, controlled for any extraneous effects of organization size, size was measured as the natural logarithmic

transformation of the number of fulltime employees. Additionally, we controlled for age of organization, whether the organization has been established before. We controlled for prior performance, as associated slack resources in organizations could influence their innovative capabilities (Hill & Rothaermel, 2003). Lastly, pertaining to the nature of the organization, we measured how employees can contribute effectively to achieving organization goals. The nature of the organizations and employee contribution are competing in environment control which is known to influence their innovative capabilities.

*Hypothesis 3: Organizational characteristics will moderate the association between the intellectual capital and innovation capability and organizational performance.*

*Hypothesis 3a: Organizational characteristics will moderate the association between the organization motivation and innovation capability and organizational performance.*

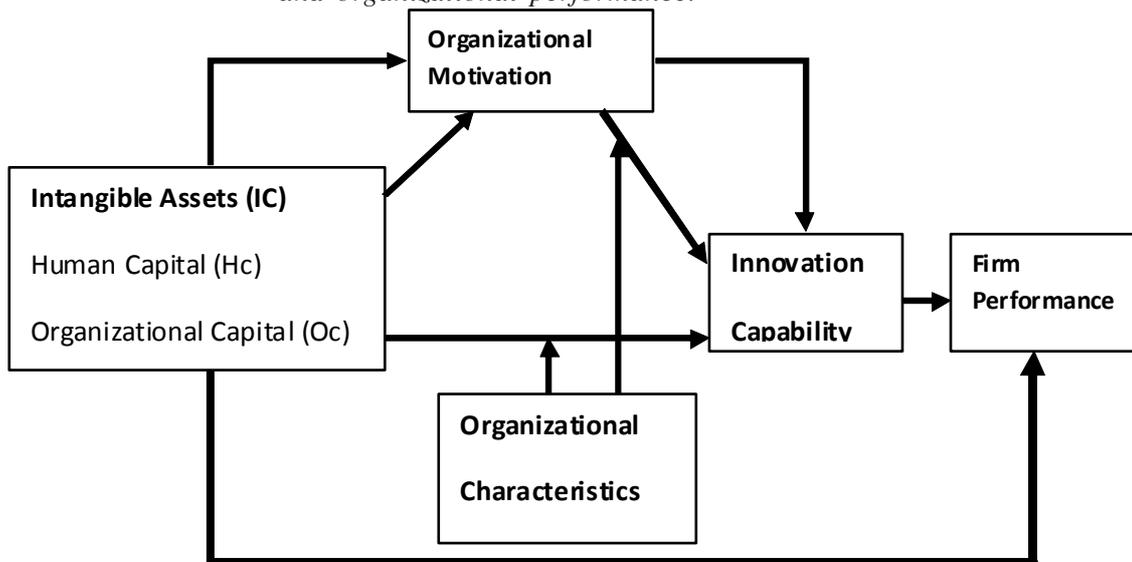


Figure 1: Conceptual Framework

#### 4. METHODOLOGY

The research strategy applied in the paper, will combine both quantitative and qualitative methods. The first empirical part of the research will follow quantitative approach. Among the sample, there were some organizations which were at the establishing stage and some organizations which were extended and therefore had no performance data. These instances reduced the number of organizations in the sample that were eligible for participation from 600 to 450. We received 316 filled questionnaires, after deleting missing data or unfilled some cases, 304 cases were retained for analysis yielding an effective response rate of 67%.

Items for the survey questionnaire were developed after an extensive review of the relevant literature on intangible assets in manufacturing industries, Innovation capability, and firm performance and organizational motivation in general. The total number of items included in the survey was 42 including those items that were used in this study and other items that were used in order to tap into other research questions. The Pilot tested survey that focused on the content of the study constructs was conducted with HR and line managers in four large companies. A five-point Likert-scale, with anchors ranging from (1) strongly disagree to (5) strongly agree are used for this measure. We tested our hypothesized using single indicator structural equation modeling with measurement error terms specified. Through the use of SPSS 21 and AMOS 20 with maximum likelihood estimation allowed for simultaneous estimation of our proposed relationships.

## **5. FINDINGS AND DISCUSSIONS**

### ***Description Statistics***

The demographic percentages are based on the questionnaires without missing data. As mentioned before, the respondents come from a variety of different organizations and comprised 55.3% males and 44.7% females. Their ages ranged from 20 to 59, around 50% being in the range of 25-35 years old. 17.4% are upper level managers, 55.9% are middle managers (including 20.4% are Officers and 35.5% are Executives), 21.7% are lower managers (Supervisors), and 4.9% are non-management personnel (Team leader). Respondents indicated that they come from organizations with sizes in the range of 100-over 3000 full-time equivalent employees. Around 78% come from 501-2000 employee size of firm.

Regarding education level, 2% are from O'level (10 years school education), 22.7% from A'level (advance level, 13 years school education), 18.4% from certificate (less than one year course), 28.0% from diploma (more than one year course), 25% from graduate degree (three to four years degree), 3.6% from master (one to two years post degree) and none of them have PhD (Doctoral degree).

Experience in this organization included 0-1 year (8.6%), 2-4 years (40.5%), 5-7 years (30.3%), 8-10 years (8.2%), and over 10 years (12.5%) in the same organization. The industries represented are dominated by those industries with a higher probability of importance of intangible assets. This sample

attempts to represent various levels within an organization in which intangible assets management processes would exist to encourage employees to participate in wealth generating or creating activities associated with intangible assets.

The strategic nature of the survey demands that executives and managers fill in the questionnaire developed for this study. However, while executives are the most knowledgeable sources of firm-level strategic phenomena, where the research shows that more than 50% are having above diploma and degree, which satisfy respondents' survey of intangible assets and innovation capability and firm performance in the textile & apparel industry in Sri Lanka.

Therefore, we can conclude that the responses came from key informants from each organization who have the knowledge and experience to address the issues under investigation in this study. See (Table 1).

The results of the descriptive results, the mean of all data was in the range of 3.80 to 4.00. The average mean of the human capital construct (5 items) was 3.956. The average mean of the social capital (5 items) construct was 4.013. The average mean of organizational capital construct (5 items) was 4.053. The average mean of organizational motivation construct (4 items) was 3.996. The average mean of innovation capability construct (5 items) was 3.973. The average mean of firm performance construct (6 items) was 4.218. The average mean of size of firm was 2.687. The average mean of the age of firm was 2.217. The average mean of awards winner was 3.585. The average mean of union present was 3.796. The construct with the highest mean (4.218) of firm performance, and the construct with the lowest mean (3.956) of human capital. However, all average of constructs was near 4 and above.

Table 1: Descriptive statistics of Sample Characteristics

Samples	Items	Count	Percent
Gender	Female	136	44.7%
	Male	168	55.3%
Age	20-25yrs	74	24.3%
	26-35yrs	149	49.0%
	36-50yrs	78	25.7%
	over 50yrs	3	1.0%
Married status	Single	116	38.2%
	Married	187	61.5%
	Widowed	1	0.3%
Education	O'Level	6	2%
	A' Level	69	22.7%
	Certificate	56	18.4%
	Diploma	85	28.0%
	Bachelor	77	25.3%
	Master	11	3.6%
Jobs	Manager	53	17.4%
	Officer	62	20.4%
	Executive	108	35.5%
	Supervisor	66	21.7%
	Assistant	15	4.9%
Experience	0-1 years	26	8.6%
	2-4 years	123	40.5%
	5-7 years	92	30.3%
	8-10 years	25	8.2%
	over 10 years	38	12.5%

**THE RELIABILITY, AND VALIDITY ANALYSIS**

The variable measurement scale for six key variables were developed based on previous literatures. We assessed the construct validity of these measures by examining their dimensionalities, and convergent, and discriminant validities. We used evidence from earlier research conducted confirmatory factor analysis to establish their construct validities. Cronbach’s alpha values are also reported to demonstrate inter-item reliabilities of the measures used.

The intangible assets measures developed for this paper are somewhat different from measures used in previous studies as amended questionnaires from the literature were used in this study. A one-factor solution in which all the items had high loadings (average loading = 0.742) and the single factor explaining 55% of the variance was obtained and the components of intangible assets as human capital, social capital, and organizational capital had high factor loading (average loading more than 0.65), and the Cronbach  $\alpha$  value (HC= 0.869, SC = 0.865, and OC = 0.878) respectively higher than standard. Therefore, the general recommendations of the commonly used Cronbach  $\alpha$  coefficient = 0.7 as the standard. Then, convergent validity of this measure was examined by demonstrating its relationship with theoretically related constructs. In addition, we computed composite reliability (CR), which is defined as the total amount of true score variance in relation to the total score variance. The component of intangible assets had composite reliability more than 0.9 (HC=0.905, SC =0.904, OC=0.911). As a general guideline, composite reliability of 0.7 or higher is considered good.

The intangible assets of an organization are likely to mediate the effect of organizational motivation on Innovation capability. However, motivation by itself can lead to greater levels of Innovation capability. However, a one-factor solution with the single factor explaining 43% of the organizational motivation variance emerged, with an average item loading of 0.658. The Cronbach  $\alpha$  coefficient value of 0.809. Also the composite reliability (CR) value of 0.885, is high and considered as good.

Several firms-level variables that can potentially affect the outcomes of this study were used as organizational characteristics or moderate variables. It was measured by firm size, firm age, and employee union and rewards winner. However, a two-factor solution with the single factor explaining 66% of the variance emerged, with an average item loading of 0.814. The Cronbach  $\alpha$  coefficient value of 0.884 because two sets of items were included to measure organizational characteristics. And the composite reliability (CR) value of 0.947 is high and considered good.

A significant part of management literature indicates that innovation capability has also come to be an important part of the competitive power of the competitive power of the firms. Innovation capability refers to the firm's ability to transform knowledge and ideas into new products, processes systems for the benefit of the firms (Lawson and Samson, 2001). However, a one-factor

solution with the single factor explaining 44% of the innovation capability variance emerged, with an average item loading of 0.666. The Cronbach á coefficient value of 0.874. And also the composite reliability (CR) value of 0.908 is high and considered good.

Firm performance was measured by using a perceptual measure of firm performance. Because it is notoriously difficult to obtain objective performance data for all firms, much of previous firm performance research also relies on managers' perceptual evaluations of firm success (e.g., Anderson et al, 2001, 2002; Venaik, Midgley, & Devinney, 2005). However, a one-factor solution with the single factor explaining 56% of the variance emerged, with an average item loading of 0.749. The Cronbach á coefficient value of 0.930. And also the composite reliability (CR) value of 0.947 is high and therefore is considered good. Hair et al. (2010) have stated that reliability is one of the indicators of convergent validity. High reliability shows that internal consistency exists, indicating that measures can represent the same latent construct. The Cronbach alpha of these constructs indicated that all constructs were highly reliable because all constructs were higher than 0.70, ranging from the lowest reliability of 0.809 of organizational motivation to the highest reliable construct of 0.930 of firm performance.

### **MODEL ANALYSIS**

We assume that the direct model validation, found intangible assets of the enterprise has a certain role in influence on innovation capability, in which the role of the firm's organizational motivation has strongest coefficient of 0.483,  $p < 0.05$ ; followed by firm performance 0.424,  $p < 0.05$ ; intangible assets, the impact coefficient of 0.313,  $p < 0.05$  significantly. The impact factor of organizational characteristics is 0.029,  $p < 0.05$  not significance; here we found that the intangible assets of the firm have the most significant influence on innovation capability, this also confirms the intangible assets of the human, social, and organizational capital as the company's core intangible assets and research ideas.

Further, the organization motivation and firm performance have a most significant impact on innovation capability; this is different than expected, indicating the pursuit of intangible assets and innovation capability and some influence between intellectual capital and innovation capability. Organizational characteristics has no significant impact on innovation capability, but it may indirectly impact on innovation capability. Model control variables: firm size,

firm age, awards winner, and union present for innovation capability effects vary, it can be seen from the results in these four variables; only firm age on innovation capability not significantly affected, the coefficient of - 0.088,  $p < 0.05$ , indicating that firm age and innovation capability have certain negative correlation but not significant, startups often called faster than the age-old company's growth is relatively slow, but size of firm has significant negative affected on innovation capability, firm size affects the innovation capability, significant coefficients is -0.354,  $p < 0.05$ . The Awards winner and Union present were also significantly impact on innovation capability, coefficient was significant respectively 0.487, 0.595,  $p < 0.05$ .

### **MEDIATION AND MODERATION MODEL ANALYSIS**

#### ***Indirect (mediation) effects hypotheses:***

Methods to test mediation and intervening variable effects are abound in research. In this paper, the researcher relied on three methods to test for mediation – the Baron and Kenny (1986) procedure, the Sobel (1982) test, and path analysis (Table 2). All of these methods have different strengths and weaknesses associated with them and there is no agreement in the research literature as to the best way for testing mediation. We briefly described each method and the decision criteria to support a mediating effect, prior to reporting results based on these tests.

Hypothesis *H2*, and *H2a* proposed that the relationship between intangible assets and innovation capability is mediated by organization motivation. The results in Table 2, Figure 1 show that intangible assets have a significant impact on innovation capability to satisfy the first condition of the Baron and Kenny (1986) procedure for establishing mediation. Drawing from the more recent developments in the use of the Baron and Kenny (1986) procedure, testing the indirect effect of intangible assets on innovation capability requires a significant relationship between intangible assets and organization motivation and between organization motivation and innovation capability in the presence of innovation capital. There was support for the second condition based on the results of Hypothesis *H1* reported in the preceding section. Table 2, Figure 1 shows that organization motivation (OGM) and innovation capability (INNOC) are also significantly related in the presence of intangible assets ( $\hat{a} = .44$ ,  $p < .05$ ) – satisfying the third condition. Based on the support found for both of these relationships, the presence of an indirect relationship is supported between intangible assets and innovation capability through organization

motivation. Sobel (1982) test was further conducted to test the significance of the indirect effect of intangible assets on innovation capability. The result of this test provided further support for the significance of such an indirect effect (Sobel  $z = 4.263, p < .05$ ). Based on these results, Hypothesis  $H2a$  was supported.

In this mediating and moderating model, we included organizational characteristics as a moderating variable. Hypothesis  $H3$  proposed that the relationship between intangible assets and innovation capability is moderated by organizational characteristics. The results in Table 2, Figure 1 show that intangible assets are significantly and positively related to the dependent variable ( $\hat{\alpha} = 0.43, p < .05$ ) - satisfying the first condition of the Baron and Kenny (1986) procedure. The second condition that the independent variable (intangible assets) be related to the mediator (organizational motivation) was also satisfied, given the support found for Hypotheses  $H2$  reported above. Finally, as shown above, in the presence of organization motivation, and organizational characteristics, the effect of intangible assets on innovation capability was reduced ( $\hat{\alpha} = 0.43, p < .05$ ), while the impact of organization motivation was positive and significant ( $\hat{\alpha} = 0.44, p < .05$ ), and organization characteristics has positive impact ( $\hat{\alpha} = 0.43, p < .05$ ), satisfying the third and fourth conditions for establishing partial mediation. Thus, Hypothesis  $H2a$  was supported based on the original Baron and Kenny (1986) procedure. The results of the Sobel test provided further support for the significance of the indirect relationship between intangible assets and innovation capability through organization motivation in the model (Figure 1) when organization characteristics is moderating the Sobel results shown as insignificant (Sobel  $z = 3.895, p < .05$ ).

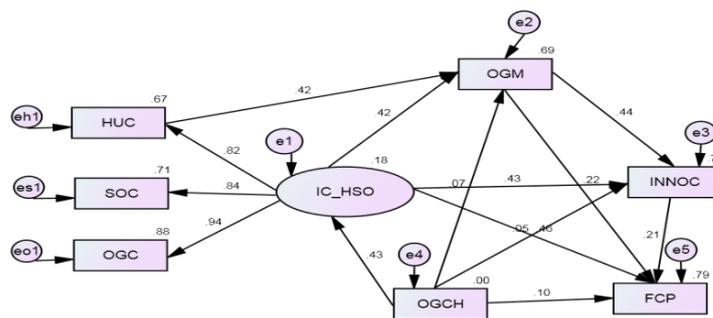


Figure 1: Mediating and Moderating Model of Innovation Capability

The innovation capability will mediate the relationship between organization motivation and firm performance. As reported in Table 2, Figure 1, organization motivation was significantly related to firm performance, testing the indirect effects of organization motivation on firm performance through innovation capability requires a significant relationship between organization motivation and innovation capability and between innovation capability and firm performance in the presence of organization motivation.

There was support for significant relationships between both organization motivation and innovation capability based on the results reported in the preceding section (Hypothesis *H2* and *H2a*). As reported in above, the beta coefficient of innovation capability remained positive and significant ( $\hat{a} = 0.21$ ,  $p < .05$ ) after controlling for organization motivation, satisfying *condition 3* for establishing the presence of an indirect relationship. However, the Sobel (1982) test for these hypotheses has reach significance ( $z_{\text{Sobel}} = 3.289$ ,  $p < .05$ ). As a result, while there is support for Hypothesis and based on the more recent version of the Baron and Kenny (1986) procedure, viewed in combination, the support is somewhat weaker compared to the support found for the previous hypotheses – indicating a relative lack of power to detect an existing mediated relationship in this case.

The hypothesized model (Figure 1) holds up well when tested against the confirmatory sample of 304 of textile & apparel industry of Sri Lanka. While the  $X^2$  value of 5.609 is statistically significant with 7 degree of freedom, the root mean squared error of approximation is (RMSEA = 0.000, and RMR = 0.004) which suggests a good fit since it is below the critical threshold of 0.08 as suggested by Browne and Cudeck (1989). Further, the Normed Fit Index (NFI = 0.997), the Goodness of Fit Index (GFI = 0.995), the Incremental Fit Index (IFI = 1.001), and the Confirmatory Fit Index (CFI = 1.000) are all between 0.99 and 1.0, suggesting that the research model fits the observed data well.

The results illustrate the positive and dis-ordinal mediating impact of organization motivation on the relationship between intangible assets and innovation capability. This suggests that when firms possess high levels of motivation, the relationship between intangible assets and innovation capability is positive and under low levels of organization motivation the relationship between intangible assets and innovation capability is negative. Finally, this positive impact of organizational motivation on the relationship between intangible assets and innovation capability suggests that there is a positive relationship between intangible assets capital and innovation capability.

**INTERACTION AFFECTS (MODERATION) HYPOTHESES.**

The moderation effect is present when the addition of the interaction terms to the model that contains the control, independent, and the moderator variables causes a significant change in the  $F$  value and the coefficients of the interaction terms are significant. Table 2 presents the results of the moderated regression analysis for innovation capability. In the first set of hypotheses, it was predicted that organization motivation will be more strongly related to innovation capability in cases when organization motivation and the three facets of intellectual capital are high. In Model 1, control, independent, and moderator variables were entered. Consistent with previous results, firm size is negatively and significantly related to innovation capability, and firm age is also negatively affect but not significant related to innovation capability.

Yet, in the presence of organizational characteristics, organization motivation was a significant predictor of innovation capability. In Model 4, four interaction terms were entered simultaneously causing a significant  $F$  change in the model ( $\Delta F = 80.17, p < .01$ ) suggesting the interaction terms explained additional variance over and above that accounted for by variables in the first step. While the interaction term of organizational characteristics was significant ( $\hat{\beta} = 0.122, p < .05$ ), only one of interaction beta coefficient was negative, but overall it supports Hypothesis  $H3$ . The interaction term of organizational characteristics and intellectual capital had also the same trend with a significant and negative coefficient. Thus, there was only minor support for Hypothesis  $H3a$ . The three facets of organizational characteristics (age, awards, and union) would have a positive moderating impact on the relationship between intangible assets and innovation capability. Model 5 in Table 2 reports the results of the moderated regression analysis. There was a significant  $F$  change after the inclusion of the interaction terms and two of the interaction terms had non-significant coefficient.

**6. CONCLUSIONS AND RECOMMENDATIONS**

In this study, we found that intangible assets facilitated by organization motivation that lies outside and inside of the firm have an indirect effect on innovation capability and firm performance. These practices were positively related to innovation capability, which, in turn, was related to firm performance. While the positive relationship between intangible assets and innovation capability was a strong and consistent finding throughout all the analyses performed, the relationship between intangible assets and firm

performance seems to be weaker and depends on the organization motivation and innovation capability of other contextual variables. Results also supported a direct relationship between innovation capability and firm performance. No support was found for the moderating role of organizational characteristics in strengthening the relationship between intangible assets and innovation capability. Overall, the findings of this study extend both knowledge management and innovation management literatures in important ways, it shows that the knowledge management, and resource base view framework are a useful theory for opening up the black box between intangible assets, innovation and performance in export oriented firms.

The skills level of Sri Lankan workers is a positive factor when considering the textile & apparel manufacturing industry. Sri Lanka has a highly trainable work force in the Asian region that has a much higher literacy rate which is similar to the developed countries (Porter, M.E., 1998). Considering the motivation level of the workers, to work in the textile & apparel manufacturing industry at the operator level, it should be noted that textile & apparel industry is the major employment provider for Sri Lankan economy. Modern management practice in the textile & apparel manufacturing industry considers employees as a valuable assets. Most of the organizations have a good level of employer-employee relationships. Instead of labour unions the apparel manufacturing organization in Sri Lanka has workers' councils. On the other hand since most of the Sri Lankan manufacturers lack knowledge of foreign markets as well as data on fashion forecasting, there is an emerging demand for a supporting service in the area of marketing research and fashion forecasting agencies.

A final note on contribution to innovation capability research: The existence of both intangible assets and also an organization motivation path to innovation capability and ultimately firm performance is what essentially differentiates this model of innovation capability that would be applicable to manufacturing firms or organizations operating within their own national boundaries. That is, while the addition of the organization motivation path is a contribution to the intangible assets literature which has traditionally explored knowledge capital, exploration of the internal path is a contribution to the innovation capability literature which has traditionally focused on the external path. This study opens up new avenues for further theoretical and empirical advancements in intellectual capital research. Future studies can test these interactions on larger sample sizes to examine whether the results also hold for larger sample sizes.

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*Table 2: Intellectual Capital and Innovation Capability Model Summary*

Variables	Model1	Model2	Model3	Model4	Model5	Model6	Model7
Innovation Capability (INNOC)	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>
IntangibleAssets(IC_HSO)	0.777 (0.000)	0.735 (0.000)	0.387 (0.000)	0.368 (0.000)	0.597 (0.000)	0.751 (0.000)	0.154 (0.319)
Organizational Motivation (OGM)			0.487 (0.000)	0.475 (0.000)	0.792 (0.000)		2.137 (0.000)
Organizational Characteristics (OGCH)		0.105 (0.008)		0.070 (0.046)		0.122 (0.354)	-0.079 (0.771)
IC x OGCH						-0.028 (0.892)	1.014 (0.001)
OGM x OGCH							-1.416 (0.095)
IC x OGM					-0.495 (0.026)		-1.540 (0.015)
IC x OGM x OGCH							0.652 (0.406)
$\beta$	0.503	0.252	0.528	0.359	-0.335	0.189	-0.924
$R^2$	0.604	0.614	0.690	0.694	0.695	0.614	0.715
$F$	461.31	238.97	334.35	226.47	227.53	158.80	106.11
$Sig.$	0.000	0.000	0.000	0.000	0.000	0.000	0.000

*Source: Survey data*

Table 3: Summary Descriptive Statistics and Correlation Matrix (N=304)

Variables	HUC	SOC	OGC	OGM	INNOC	FCP	Size	Age	Awards
SOC	0.691** 0.000	-							
OGC	0.769** 0.000	0.791** 0.000	-						
OGM	0.782** 0.000	0.658** 0.000	0.748** 0.000	-					
INNOC	0.688** 0.000	0.689** 0.000	0.751** 0.000	0.797** 0.000	-				
FCP	0.739** 0.000	0.718** 0.000	0.798** 0.000	0.795** 0.000	0.799** 0.000	-			
Size	-.468** 0.000	-.275** 0.000	-.338** 0.000	-.397** 0.000	-.354** 0.000	-.397** 0.000	-		
Age	-.194** 0.001	-.089 0.122	-.133* 0.021	-.029 0.613	-.088 0.124	-.070 0.220	0.690** 0.000	-	
Awards	0.504** 0.000	0.443** 0.000	0.551** 0.000	0.489** 0.000	0.487** 0.000	0.567** 0.000	-.199** 0.000	0.001 0.983	-
Union	0.595** 0.000	0.527** 0.000	0.562** 0.000	0.557** 0.000	0.595** 0.000	0.664** 0.000	-.456** 0.000	-.280** 0.000	0.458** 0.000

\*\* indicates statistical significance at the 1% level (2-tailed),

\* indicates statistical significance at the 5% level (2-tailed), Source: Survey data