Managing knowledge through human resource management practices in SMEs

Daria Sarti *
Department of Sciences for the Economy and for the Enterprise
University of Florence
Via delle Pandette 9, 50127 Firenze, Italy
E-mail: daria.sarti@unifi.it

Lucia Naldi
Jönköping International Business School
PO Box 1026, 551 11 Jönköping, Sweden
E-mail: lucia.naldi@jibs.hj.se

* Corresponding author

Abstract
The purpose of this paper is to investigate the key role of human resource system (HRS) in predicting innovation among Small and Medium Enterprises (SMEs) in an organizational learning perspective. Particularly, the specific moderation effect of HRS on the relation between the capability of firms to absorb knowledge and their innovation is here studied.

The hypothesis will be tested through a regression analysis on data collected through an on line questionnaire administered to representatives of a sample of 3223 small and medium sized firms in different industries in Italy. The analysis was carried out on a sample of respondents of 126 SMEs.

This paper puts in evidence that HRS affect SMEs innovation, also it proves that there is a moderation effect of HRS on the relationship between absorptive capacity and innovation.
This paper aims at contributing to the research concerning the development of human capital for innovation thorough HRS in small and medium firms (SMEs). The paper will contribute to research on SMEs by addressing two major questions, that are: does human resources systems enhance effectively innovation in SMEs? And, further: does it have a key role in reinforcing the relation between absorptive capacity and innovation?

Results suggest that the implementation of HRS is critical for SMEs' innovation processes. The paper aims at contribute to the investigation on the importance for SMEs to innovate through HRS. Results suggest that SMEs should pay more attention to HRS as a sort of organizational investment able to develop the overall human capital and, in turn, affect in a positive way the relation between the organization ability to explore and exploit critical external knowledge and its innovation achievement. Results could be useful giving some point of reflection to SMEs management as well as to policy makers willing to implement local policy for supporting SMEs development.

**Keywords** – Small and Medium Enterprises, Human Resource System, Absorptive Capacity, Innovation

**Paper type** – Academic Research Paper
INTRODUCTION

In the last two decades, particularly resource based view (RBV) scholars, have insisted on the relevance of internal assets as determinants of firms’ competitiveness (Barney, 1991; Kogut and Zander, 1992; Grant, 1996; Teece, 2000). A growing stream of literature, enriching current debate, highlights especially organizational processes and managerial actions that are implemented to use firm’s knowledge assets in order to successfully reach organizational objectives (De Winne and Sels, 2010; Ireland et al., 2003; Ray et al., 2004).

According to many authors human capital, that is knowledge and competencies of employees, is not sufficient per se for the organization’s success, so that in order to pursue organizational effectiveness human capital and knowledge assets should be developed and controlled for. In this sense, over the years the interest on the determinants of firms’ success has arisen especially demonstrating a relationship between practices devoted to managing and developing human resources and firm performance (Sels et al., 2006).

However, as widely recognized, only a few studies focus on the relationship between human resource practices and performance (Cardon and Stevens, 2004; Carlson et al., 2006; Fabi et al., 2007; Heneman et al., 2000; Hornsby and Kuratko, 2003; Katz et al., 2000; Tansky and Heneman, 2003) and further, most of the paper in the area of HRM-performance research, mainly focus on financial performance, turnover and productivity (Boselie et al., 2005; Huselid, 1995; Ichnioski et al., 1997; Wright et al., 2003). Despite the growing need for new product and new solutions in order to cope with the current market complexity, attention to innovation as an outcome variable has been neglected (Chow et al., 2008). This despite it represents an important indicator of operational performance (De Winne and Sels, 2010).

Also only a small number of studies have focused on the key role played by Systems of Human Resources (HRS) for firm’s innovation despite the general agreement on its importance.

Further the relationship between human resources (HR) and innovation is much more investigated by innovation scholars rather than from scholars concerned in HR management and development (De Leede and Looise, 2005). Also, as suggested in the Guest Editorial of a recent special issue on Innovation and HRD (Sheehan, Garavan and Carbery, 2014) the issue of HRD and innovation has been until now under-researched. In this sense this could represent a key area of investigation in the future into the Human Resource Development debate especially within that HRD perspective which specifically focus on organizational learning (Garavan et al., 2000).
The purpose of this study is to develop an analysis demonstrating the importance of HR Systems (HRS) for innovation in SMEs. In this sense this paper aims to demonstrate the positive relationship between HRS and innovation and to support the importance of HRS improvement by proving its key role in favoring the relationship between absorptive capacity and innovation. Particularly, here it will be considered the theoretical perspective focusing on the intensity of complementarities of HRSs in pursuing innovation processes among SMEs.

The paper try to link together two different streams of research. On the one side the literature in Strategic Human Resource Management highlighting that HR systems have a positive effect on innovation and on the other side those contributions among Absorptive Capacity debate supporting the role of HR system in affecting the innovation process. In this sense a positive moderation of HR system on the relation between Absorptive Capacity and innovation will be hypothesized and tested.

The context of this analysis is the context of SMEs (Small and Medium Enterprises). The reason for this sort of choice arises not only from the general recognition of SMEs relevance in most of western economies but also from the SMEs specific organizational characteristics which make them (probably) the most suitable unit of analysis in order to study the effects of HR mechanisms on innovation. In fact, small and medium sized companies seem particularly adapt since “their transparency and lower complexity […] largely dependent upon the functioning and performance of the central actors, i.e., owners/managers and employees, and have less tolerance for inefficiency […] therefore the relationship between HR related variables and innovative output will be more straightforward and less obscured by other firm and management characteristics” (De Winnie and Sels, 2010: 1866).

Also, SMEs context represents a specifically interesting area for this kind of investigation since the evidence that in this kind of firms people represent the key repository of knowledge and HR practices (HRPs) massively contribute to the organization’s competitive advantage (Cardon and Stevens, 2004; Chandler and McEvoy, 2000; Katz et al., 2000).

Further, a number of authors bemoaned that within current literature only a few contributions analyse HR practices in SMEs compared to those investigating HR practices in larger firms. And this represent an important gap to be covered not only for the specific characteristics that distinguish SMEs from big-sized enterprises but also for the key role that this kind of company plays in the economy.
THEORY AND HYPOTESIS

Human Resource Systems and Innovation

In many streams of research a number of variables have been identified as predictors of organizational innovation. In the HRM strategic debate, the basic assumption is that human capital could represent a potential source of competitive advantage. According to empirical evidence within the strategic HRM research tradition, human capital, that is for example employee’s and owner or manager’s expertise and their level of education, may affect positively innovation (Smith et al., 2005; Hadjimanolis, 2000).

In the same broad stream of research, a group of studies have focused on the relationship between HR practices, as independent variables, and innovation, as the dependent variable, focusing on the basic principle that it is in particular through the way human resources (HRs) are managed that organizations can pursue competitive advantage as well as innovation. This is mainly due to the core role of individuals as “initiators” of the organizational learning process, knowledge creators and “repositories” who are directly and actively involved in the whole innovation process.

The contingent approach to the study of the relationship between HRM and innovation suggests that HR best practices do not exist. According to authors, consistency between HR Systems and other aspects of the organization, such as for example its strategy, is needed in order to achieve organizational success (Miles and Snow, 1984; Purcell, 1999; Wright et al., 1994). In this configurational perspective HR practices are more effective in influencing innovation if they are applied together.

In fact, according to Laursen and Foss (2003) HR practices enhance each other. In the current debate a number of studies have focused particularly on the link between “complementary knowledge stocks and innovation performance”. As suggested by Milgrom and Roberts (1995: 181), who first introduced the concept of edge worth complementarities, “doing more of one thing increases the returns to doing (more of) the others”. In this view, complementarities are systemic features and important source of path dependence. For a successful change firms have “to involve many, perhaps all, relevant variables of a system and involve them in specific ways” (Laursen and Foss, 2003: 247).
According to these studies the impact of bundles of interrelated HR practices can be greater than the sum of the impacts of all the individual practices (Huselid, 1995). Results from empirical analysis on 1900 Danish firms support these theoretical insights suggesting that HR practices jointly give raise to better innovation performance (Laursen and Foss, 2003). Therefore it many studies it is suggested that Systems of HR practices contribute in the explanation of innovation in a positive and significant way.

In the current strategic HRM literature an integrated approach to HRM is primarily supported by authors. Previous works in the strategic HRM suggest “the use of a system-level measure for both methodological and theoretical reasons” (Messersmith and Wales, 2011: 123). There is, in fact, a wide recognition in the strategic HRM literature on system-level analysis for HRM (Delrey, 1998; Hayton, 2003; Huselid, 1995). The use of an overall measure is widely supported as expressed also by Backer and Huselid (1998: 64) which suggest that on the one side “a single index reflects the notion of a single HRM system as a strategic asset” on the other “the typical index is a summation of individual elements of the HRM system, it implies that within the broad middle range of the index there are multiple ways to increase its value” (Backer and Huselid, 1998: 64), further, an unitary measure suggest the theoretical notion of sustainability of practices and equifinality. In this sense Delery and Shaw (2001: 176) exemplify the concept by stating that: “two firms may be able to develop the same level of skill amount their work forces using very different individual HRM practice”. Since the lack of specific evidence on the relation between HRS and innovation in SMEs the first hypothesis we want to test is:

Hp1: Human Resource System positively affects innovation.

Absorptive Capacity and Innovation

The complexity of business environment has increasingly highlighted the importance of knowledge as a key source of competitive advantage and innovation for firms. It is widely recognize that in order to cope with environmental complexity, succeed and in turn achieve a sustainable competitive advantage organizations need to be aware of the key importance of organizational learning (Argote and Ingram, 2000) as the “intentional” process which manifest itself through changes in the organization’s potential behaviours (Huber, 1991) as well as in the organizational
knowledge or performance (Argote and Ingram, 2000). Organizations learn if they recognize new external knowledge useful to the organization (Huber, 1991), assimilate it, and apply it to commercial ends (Cohen and Levinthal, 1990). This capability is referred to as absorptive capacity. Later absorptive capacity (ACAP) was reconceptualised as “a dynamic capability pertaining to knowledge creation and utilization that enhances a firm’s ability to gain and sustain competitive advantage” (Zahra and George, 2002, p. 185).

The concept of ACAP is embedded in the debate on dynamic capabilities originating from the evolutionary theory of the firm. Zahra et al (2006: 918) define dynamic capabilities as the ability to “reconfigure a firm’s resources and routines”. According to authors dynamic capabilities are beneficial in turbulent settings (Teece, 2007; Zahra et al., 2006) and allow to avoid the ‘competency traps’ (Teece, 2006). The concept of absorptive capacity has been widely studied in the last two decades also giving raise to various conceptualizations (Gebauer et al., 2012). Zahra and George (2002) consider it as a multidimensional construct. In this sense four dimensions of absorptive capacity were introduced coherently to previous theoretical speculations on organizational learning (Huber, 1991); the four dimensions are: acquisition, assimilation, transformation and exploitation (Zahra and George, 2002). The first two dimensions are grouped and described as elements of the potential absorptive capacity while the latter two dimensions are considered as components of the realized absorptive capacity. According to authors, firms in order to succeed need to manage all these dimensions. Jansen and colleges (2005: 999) explain those two macro areas of absorptive capacity, i.e. potential and realized absorptive capacity, as follows:

“Firms focusing on acquisition and assimilation of new external knowledge (i.e. potential absorptive capacity) are able to continually renew their knowledge stock, but they may suffer from the cost of acquisition without gaining benefit from exploration. Conversely, firms focusing on transformation and exploitation (realized absorptive capacity) may achieve short-term profits through exploitation but fall into a competence trap (Ahuja and Lampert, 2001) and may not be able to respond to environmental changes.”

Some authors, further, consider absorptive capability (ACAP) as a key resource that can support the adoption of innovation (Dewar and Dutton, 1986; Fichman, 2001). Most prior empirical studies revealed a recursive relationship between absorptive capacity and innovation (Lane et al., 2006) while some empirical research in strategic management have focused on the relation between ACAP and innovation considering absorptive capacity as the independent variable and innovation performance as the dependent variable (e.g. Gebauer et al., 2012). For example in his study on business units in two big companies operating respectively in the petrochemical and food-manufacturing sectors, Tsai (2002) suggests that innovation is driven by centrality in the network and by the units’
absorptive capacity. Further, in a study on 461 Greek enterprises it was demonstrated that absorptive capacity contributes, directly and indirectly, to innovation (Kostopoulos et al., 2011).

According to Knudsen and Roman (2004: 53) “developing absorptive capacity requires organizational behaviors that improve the ability of the organization to learn.” The same authors suggest three organizational behaviors as able to enhance absorptive capacity: environmental scanning, collecting information from key inter-organizational actors such as buyers and suppliers and the level of professionalism.

According to the authors, absorptive capacity is dependent on the level of professionalism of employees; in other words, a professional workforce suggests a “stock” of prior knowledge, which is determinant, according to Cohen and Levinthal (1990) to comprehend and apply new knowledge. This linkage may provide the theoretical explanation for the commonly found positive association between having a more professional staff and innovation (Damanpour, 1991; Fichman, 2001).

Also it is suggested that ACAP depends on organization’s ability to scan the external environment. In fact, to get informational resources for innovation firms need to scan the environment in which they are situated (Macdonald, 1995). The use of external sources of information (Damanpour, 1991; Delaney et al., 1996; Howell and Sheab, 2001) “may promote the development of innovative ideas within the organization […] help to identify organizational deficiencies and raise perceptions that there is a need for change” and to help key decision-makers in making decisions (Knudsen and Roman, 2004: 53).

In addition to environmental scanning, “inter-organizational networks may provide important informational resources that affect an organization’s ability to innovate. These inter-organizational relationships include networks of organizational buyers and suppliers.” (Knudsen and Roman, 2004: 54).

It was demonstrated that all those organizational behaviours affecting positively ACAP (i.e environmental scanning, the collection of satisfaction data, and workforce professionalism) are positively associated with innovation (Knudsen and Roman, 2004).

Further, the authors suggest that it is the level of professional skills of an organization’s workforce which plays the key role since it promes the other organizational behaviours that are: environmental scanning and the collection of satisfaction data from connected actors such as buyers and suppliers (Knudsen and Roman, 2004). In fact it was demonstrated that the level of workforce professionalism is positively associated with environmental scanning and
the collection of satisfaction data, thus creating an indirect path between innovation utilization and workforce professionalism.

**Human Resource System as the moderator in the relation between Absorptive Capacity and Innovation**

According to Cohen and Levinthal (1990), the ability of organizational units to absorb external knowledge depends on the level of their prior knowledge, their exposure to related external knowledge and also on combinative capabilities. Among these combinative capabilities authors comprise for example organizational characteristics such as determinants of ACAP such as communication and inter-functional coordination mechanisms (Cohen and Levinthal, 1990; Jansen et al., 2005; Lane and Lubatkin, 1998; Gupta and Govindarajan, 2000). In their concept development Minbaeva et al. (2003) consider that “in addition to the prior related knowledge, there should be a certain level of ‘organizational aspiration’ […] refers to the amount of energy expected by organizational members to solve problems” (p. 589).

Simultaneously current literature on HR suggest that system of HR practices may help to create and develop high levels of skills and motivation among employees (Huselid, 1995).

Our purpose is to further enrich current debate by proving the positive effect that HR systems, as organizational mechanisms, may have in shaping the organization’s absorptive capacity for innovation. In fact, as suggested by previous studies (e.g. Minbaeva et al., 2003) HR systems are able to produce a twofold effect on the one side to support and develop the “workforce professionalization”, in terms of employees’ ability, while on the other side HR practices are able to support the “organizational aspiration” (employees motivation as named by Minbaeva et al., 2003) in terms of energy and effort spent by employees.

Although HR practices may directly influence organizational outcomes such as innovation we think it may be better conceived as a variable that facilitates the effects of absorptive capacity on organizational performance. In this sense HRS, seen here as an organizational mechanism, might be considered as able to boost the effect of the main drivers of organizational performance.

In the conceptualization describing absorptive capacity as the independent variable affecting innovation performance there are some studies considering also the role of moderators which may strengthen or weaken this relationship.
Among this debate there are studies such as the one by van den Bosch, Volberda and de Boer (1999) who suggest the moderating effect of business strategy on the relationship between ACAP and innovation. Therefore whether or not absorptive capacity can be translated in innovation will depend on investments in human capital done by the firm through the implementation of HR systems of practices.

It was already discussed on the prominent role played by HRS in predicting innovation and there are also some studies suggesting the significant role of some HR practices (e.g. training and professional development activities) as means to enhance absorptive capacity (Cohen and Levinthal, 1990). Therefore we believe that there are a number of reasons to believe that absorptive capacity will have more impact on innovation for firms with higher degree of HRS.

It was suggested that HR practices have a positive effect on employees’ individual ability and motivation and in turn on their overall effort. Therefore in a context where high degree of motivation and effort among employees is favoured, a capability such as the absorptive capability, which is individuals related, will have a higher impact on innovation. Therefore HR practices may help in developing the organizational human capital and in turn may represent a key instrument in order to favour the relationship between organizational learning and innovation. There is evidence that absorptive capacity and innovation are affected by the human capital.

We recognize the moderating role of organizational characters in the relation between absorptive capacity and innovation. Since the relevance of organizational features in shaping innovation, we posit that for innovation processes, absorptive capacity is the more effective the more organizational mechanisms such as HR systems are implemented. Thus:

\[ \text{Hp2: HR system positively moderate the relationship between absorptive capacity and innovation in such a way that higher levels of HR system will reinforce the positive relationship between absorptive capacity and innovation.} \]

In this sense the paper tries to demonstrate that the managerial practice could play a relevant role despite it has been long disregarded in strategic literature (Kraaijenbrink et al., 2010). Indeed, the focus on the importance of developing HR systems for organizational learning and innovation might represent a flourishing arena of research among HRD scholars.
METHOD

5.1 The dataset

The dataset was built based on the Italian database AIDA\(^1\). It represents a database containing general and financial information about over 700,000 Italian firms created by Bureau Van Dijk.

The selection of firms to be included in the dataset followed two criteria: (1) they have a number of employees less than 250 and (2) belong to different industries that are: information technology, consulting, furniture, mechanical and textile. In order to define the sector ATECO 2007\(^2\) was used.

Of the 4,564 names (of firms) extracted from AIDA following the above mentioned criteria, for 3,223 was possible to get the e-mail address. The search (of all the email addresses) was conducted in the companies’ websites which were reached thanks to online search engines by using firm’s general data (i.e. name and postal address). In the end, firms for which a valid email address was found were included in the final dataset. Therefore 3,223 out of 4,564 firms, that is 71% of the total population taken from AIDA, were included in the survey.

5.2 Data Gathering

An invitation to fill the questionnaire reached 2,342 firm’s representatives via email. The questionnaire was directed to the top management, i.e. the entrepreneur or the HR manager or a managerial position who had a deep understanding of the HRM processes and firm performance.

Invitation’s email were sent out in distinct waves for each industry involved. After the first wave of invitations, two further reminder email were sent to all the firms that had not completed the questionnaire yet. The first reminder was

\(^1\) AIDA is a Bureau van Dijk database containing economic data on firms operating in Italy. This database is similar to AMADEUS 200 (Europe) and OSIRIS (World).

\(^2\) This classification system is adopted by the Italian National Statistic Institute (ISTAT) and it is the Italian version of the European classification system that is Nace Rev.2.
sent approx after 1 month later, the second reminder after 2-3 weeks. Data were collected from January to June 2013.

Firms had the possibility to fill in the questionnaire on paper (and then send it back via fax or scanned via email) or through the online version of the questionnaire\(^3\).

Among the 135 responses collected, for the purpose of this research, 126 responses were considered as valid and used for the analysis accounting for a 5.4% response rate.

The overall response rate is very low if compared to a response rate, of at least 50%, obtained in two similar studies among, respectively, Spanish and Chinese SMEs (Jimenez-Jimenez and Sanz-Valle 2005; Li and Matlay 2006).

In relation to possible explanation to such a low response rate one could be linked to the topic of the questionnaire which is perceived as confidential by most companies. Secondly, the SMEs population is currently over surveyed. The growth in the academic interest on these firms may have increased the number of requests to enterprises to complete surveys and, in turn, may have lowered their response rate. This is particularly true for those firms belonging to the Made in Italy\(^4\).

Further the current crisis may have reduced the individuals’ overall attitudes toward surveys. In the end, the questionnaire might be perceived as quite long, the average response time was 20 minutes, and was requested to be completed by top management whose time is often scarce.

5.3 Variables of analysis and measures

*Innovation.* To measure *innovation* we adopted Covin and Sevin’s (1989) and Miller (1983)’s three semantic differential items. The scale demonstrates internal consistency with a coefficient alpha of 0.82.

*Absorptive Capacity.* ACAP was measured using the scale adopted and validated in previous studies (Jensen et al. 2005). The authors suggest four dimensions of ACAP that are: acquisition, assimilation, transformation and exploitation. For the four dimensions the authors suggest four different subscales. Specifically the original measure is

---

\(^3\) Out of the 95 valid questionnaire, most were filled through the on line platform, three were sent via fax and five were sent scanned via email.

\(^4\) In this sense I received emails declining my invitation and complaining the huge number of survey’s requests they receive and the fact that they have to respond first to mandatory surveys (such as the one held by the National Statistics Institute).
composed by 20 items. Five of them refer to acquisition, three items to assimilation, six items to transformation and six items to exploitation. For the purpose of this study two items measuring acquisition in the original scale were deleted since they were not coherent with the current context (i.e. “our unit has frequent interaction with corporate headquarters to acquire new knowledge” and “Employees of our unit regularly visit other branches”). Altogether the items used for the measure of ACAP in this study were 18. A factor analysis was performed. Results suggest that the variance explained by one-factor was higher than the variance explained by four-factor measure of ACAP so that we ended at using an overall measure for ACAP. The scale demonstrates internal consistency with a coefficient alpha of 0.93. Items were measured on a five-point scale on which 1 was “strongly disagree” and 5 was “strongly agree”.

Human resource system. HRS were measured using items adopted in previous HR research (e.g. Huselid 1995). Specifically the items were taken from Cassel et al. (2002) and asked respondents to indicate the perception about the functioning of that practice within the organization. Items were measured on a five-point scale where 1 is “Very Poor” and 5 is “Very Good”. According with Cassel et al. (2002) the HRS included the eight key HR domains (Delery and Shaw 2001; Huselid 1995; Wright and Snell 1991) that are: selection, equal opportunities, performance appraisal, incentive schemes, non monetary benefits, training and development, empowerment, formal HR strategy planning. In order to interpret the HR practices as a HR system, as an overall measure, in accordance with previous studies (Laursen and Foss 2003), a confirmative factor analysis was performed including all the eight practices. The scale demonstrates internal consistency with a coefficient alpha of 0.87.

Control variables. In the analysis we control for a number of possible confounding effects by including relevant control variables. Because larger companies may have more resources to innovate, we use the number of full-time employees to account for firm size. Also firm age, measured by the number of years since the company’s funding, was included. Prior research suggests that inertia may render older firms less innovative in international markets (Autio, Sapienza, & Almeida, 2000). We also dummy coded whether the firm had national or international operations to control for the strategy of the organization. Finally, we also controlled for sub-industry. In fact belonging to different sectors may affect innovation according to many contributions starting from evolutionary economic theory (Pavitt, 1984; Winter, 1984).
ANALYSIS AND RESULTS

Table 1 presents the descriptive statistics and correlation. In Table 2 we present the results of a hierarchical multiple regression analysis for innovation, measured by innovation orientation. Hierarchical regression analysis was used since it allows us to specify a fixed order of entry for variables in order to control for the effects of covariates and to test the effects of certain predictors independent of the influence of others.

In order to test the moderation effect (hypothesis 2) we have mean-centered the key independent variables before generating interaction terms (Aiken and West, 1991). In order to assess the potential threat of collinearity, we have estimated the variance inflation factors (VIF) and found that variables’ variance-inflation is well below the cut-off point of 10 (Hair, Black, Babin, Anderson, & Tatham, 2006) mitigating concerns of multicollinearity.

To test moderating effect, we multiplied HRS with ACAP and entered the multiplicative iteration items into the regression at the third step. In Table 2, Model 1 contains the control variables, Model 2 the introduces the independent variables (hypothesis 1) and Model 3 examines the moderating effect of HRS (hypothesis 2). The models show significant increase in explanatory power. Regarding the control variables, we can observe that firm size, national operations and belonging to specific industry are positively associated with innovation.

Effects of HRS on innovation among SMEs

Hypothesis 1 predicts that HRS intensity is positively related to innovation in SMEs. The coefficient of HRS intensity in Model 2, Table 1 is positive and significant, confirming that HRS is positively related to a company’s innovativeness. Therefore, hypothesis 1 is supported.

Moderation effect of HRS on the relationship between ACAP and innovation

Hypothesis 2 predicts that HR systems positively moderated the relationship between ACAP and innovation. We tested this hypothesis including in the third step of the model (model 3) the interaction term. Results shown in table 2 suggest that the moderator yields a positive and significant effect therefore, the results shows a pattern that is consistent with the moderation effect as suggested by hypothesis 2.

Further the moderation effect is displayed in Figure 1. Specifically, Figures 1 depicts the effects of HRS on the relationship between ACAP and innovation in such a way that higher levels of HR systems will reinforce the positive
relationship between ACAP and innovation. Figure 1 also shows that for very low levels of HR systems the relationship between ACAP and innovation becomes negative.

DISCUSSION AND CONCLUSIONS

Discussion and limitations

In current research the role of a firm’s HR systems in developing new products and services is not fully understand. In the light of the increasing importance of both innovation and HR systems in recent years, exploring how and under what conditions firms can benefit from their HR management to promote innovation is of primary importance. In this paper we explored the relationship between HR systems and innovation. Using data from Italian small firms, we found that HR systems influence firm innovativeness directly as well as by positively moderating the relationship between absorptive capacity and innovation. Although there is a large interest in literature on innovation and the role of organizational learning as well the key role of HR, the role of absorptive capacity and HR system role in predicting innovation was rarely examined.

In support of prior research (Shipton et al., 2006) our results indicate that HR systems—such as selection, equal opportunities, performance appraisal, incentive schemes, non-monetary benefits, training and development, empowerment, and formal HR strategy planning—facilitate innovation. This finding is also consistent with the argument that innovation activities are not longer carried out only by R&D staff, but require the active engagement and management of all employees and human resources (Paton and McCalman, 2008) in an organization.

Our results provide strong support for our second hypothesis that suggests that HR systems may also foster innovation by enhancing the positive effect of absorptive capacity on innovation. While this finding is consistent with previous studies showing that absorptive capacity enhances innovation (Cohen and Levinthal, 1990), it also sheds new light on this literature by identifying HR systems as important mechanisms through which firms can enhance the positive effect of absorptive capacity on innovation. To our knowledge, our study is the first empirical research aligning absorptive capacity and HR systems to the study innovation in firms. Specifically, our study
provides evidence of the moderating role of HR systems on the relationship between absorptive capacity and innovation. While previous evidence have proved that organizational learning affects positively innovation the findings of this study suggest that organizational learning is more effective in predicting innovation for higher degrees of HR systems.

Intriguingly, our results also show that for very low levels of HR systems, the relationship between absorptive capacity and innovation is negative. One possible explanation is that as HR systems reach very low levels firms are not able to turn high levels of absorptive capacity into innovation. In short, very low levels of HR systems my hinder the dissemination, re-combination and transformation of the knowledge of R&D specialists into new products and services. This explanation is consistent with the recent literature on absorptive capacity which stresses the important of organizational processes of knowledge recombination and transformation (Zahra and George, 2002).

From a practical point of view our study indicates that organizations aiming at developing innovation processes need to make efforts to create and sustain an integrated system of HR practices. Furthermore, HR systems can form the basis for boosting the innovation potential of the firm’s absorptive capacity. While investing in HR systems can be costly, especially for small business owners, the lack of these systems can be detrimental for innovation efforts.

Several limitations of this study need to be acknowledged. However we believe that these limitations do not invalidate the results but can rather represent stimuli to empirical advancement and refinement. We point out some of these. First, while the cross-sectional nature of the data does not allow us to test the direction of the relationships hypothesized, we have based our arguments on theory and priors studies. Future longitudinal studies may shed light on whether reverse or reciprocal relationships exist. Second, our sample is specific and quite small. At the same time, our narrow focus allowed us to control of industry specific and country specific effects. Future studies may be conducted in other industries and country settings as well as using larger samples, to test the generalizability of our results. Third, the answers came only from one entrepreneur or owner-manager for each firm. Considering the firms team leadership, the only possible adjustment is to have more than one “owner-manager answering” from each firm. Another methodological limitation is that we have relied on self-reported measures of innovation orientation, HR systems and absorptive capacity. We have chosen self-reported measures because they allowed to capture the multi-dimensional nature of these constructs, which could not have been capture by secondary or objective data.
Implications for practice

This paper has several implications both in theoretical and empirical perspective. First it tries to fill a number of gaps in current literature. First this paper links two important theoretical perspectives, on the one side, the dynamic capability approach and innovation literature and, on the other, the strategic human resource management. This theoretical background represent the most suitable framework for the purpose of the analysis presented in this paper. Second, this paper investigates the SMEs which are on the one side an interesting context to analyse but are presently unexplored especially in terms of HR systems. Third this paper demonstrates the key role of a complementary HR system - which includes different HR practices - which, according to previous studies (see for example: Minbaeva et al. 2003), affects in positive way the employees’ contribution in a twofold perspective: through the development of employees’ motivation and through the development of their knowledge and skills. Especially, in this paper, the HR system, considered as a system able to implement the individual contribution, was proven to have a positive impact on the relationship between absorptive capacity and innovation.

In an empirical perspective this paper suggest to HR managers and HRD practitioners the need for the promotion of a workplace that promotes an overall HR system. The study reveal that absorptive capacity promotes innovation but HR managers should also be aware of the importance of specific “investments” in a system of HR practices which contributes in supporting employees overall participation to the organization.

References


Table 1: Descriptive statistics and correlations

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Innovation</td>
<td>2.98</td>
<td>0.83</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Firm age (log)</td>
<td>3.30</td>
<td>0.74</td>
<td>0.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>_Iq1_4_2</td>
<td>0.01</td>
<td>0.12</td>
<td>0.15</td>
<td>-0.07</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>_Iq1_4_3</td>
<td>0.03</td>
<td>0.17</td>
<td>0.04</td>
<td>0.14</td>
<td>-0.02</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>_Iq1_4_4</td>
<td>0.10</td>
<td>0.31</td>
<td>0.21*</td>
<td>0.18*</td>
<td>-0.04</td>
<td>-0.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>_Iq1_4_5</td>
<td>0.17</td>
<td>0.38</td>
<td>0.10</td>
<td></td>
<td>-0.06</td>
<td>-0.08</td>
<td>-0.16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>_Iq1_4_6</td>
<td>0.01</td>
<td>0.12</td>
<td>0.08</td>
<td>0.04</td>
<td>-0.02</td>
<td>-0.02</td>
<td>-0.04</td>
<td>-0.06</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>_Iq1_4_7</td>
<td>0.03</td>
<td>0.17</td>
<td>0.08</td>
<td></td>
<td>-0.02</td>
<td>-0.03</td>
<td>-0.06</td>
<td>-0.08</td>
<td>-0.02</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>_Iq1_4_8</td>
<td>0.01</td>
<td>0.09</td>
<td>0.04</td>
<td>-0.03</td>
<td>-0.01</td>
<td>-0.02</td>
<td>-0.03</td>
<td>-0.04</td>
<td>-0.01</td>
<td>-0.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>_Iq1_4_9</td>
<td>0.34</td>
<td>0.47</td>
<td>-0.08</td>
<td>0.07</td>
<td>-0.09</td>
<td>-0.12</td>
<td>-0.24*</td>
<td>-0.32*</td>
<td>-0.09</td>
<td>-0.12</td>
<td>-0.06</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Firm size (log)</td>
<td>4.09</td>
<td>0.98</td>
<td>0.34*</td>
<td>0.01</td>
<td>0.04</td>
<td>-0.06</td>
<td>0.10</td>
<td>0.25*</td>
<td>0.03</td>
<td>-0.02</td>
<td>0.05</td>
<td>-0.02</td>
</tr>
<tr>
<td>12</td>
<td>National operations</td>
<td>0.35</td>
<td>0.48</td>
<td>-0.32*</td>
<td></td>
<td>0.17</td>
<td>-0.13</td>
<td>-0.19*</td>
<td>0.28*</td>
<td>-0.09</td>
<td>0.23*</td>
<td>-0.06</td>
<td>-0.03</td>
</tr>
<tr>
<td>13</td>
<td>Absorptive capacity</td>
<td>3.67</td>
<td>0.62</td>
<td>0.43*</td>
<td>-0.05</td>
<td>0.17*</td>
<td>-0.05</td>
<td>-0.01</td>
<td>0.13</td>
<td>0.05</td>
<td>0.03</td>
<td>0.04</td>
<td>-0.01</td>
</tr>
<tr>
<td>14</td>
<td>HR practices</td>
<td>3.30</td>
<td>0.66</td>
<td>0.42*</td>
<td>-0.14</td>
<td>0.22*</td>
<td>-0.23*</td>
<td>-0.06</td>
<td>0.10</td>
<td>0.08</td>
<td>-0.01</td>
<td>0.08</td>
<td>0.12</td>
</tr>
</tbody>
</table>
Table 2: Results of the OLS regression analysis for firm innovativeness

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm age (log)</td>
<td>-0.11</td>
<td>-0.06</td>
<td>-0.06</td>
</tr>
<tr>
<td></td>
<td>(0.100)</td>
<td>(0.089)</td>
<td>(0.087)</td>
</tr>
<tr>
<td>Industry dummy 2.q1_4</td>
<td>1.78***</td>
<td>0.94*</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>(0.505)</td>
<td>(0.466)</td>
<td>(0.482)</td>
</tr>
<tr>
<td>Industry dummy 3.q1_4</td>
<td>0.24</td>
<td>0.80*</td>
<td>0.63+</td>
</tr>
<tr>
<td></td>
<td>(0.409)</td>
<td>(0.378)</td>
<td>(0.377)</td>
</tr>
<tr>
<td>Industry dummy 4.q1_4</td>
<td>0.49*</td>
<td>0.43*</td>
<td>0.46*</td>
</tr>
<tr>
<td></td>
<td>(0.224)</td>
<td>(0.198)</td>
<td>(0.194)</td>
</tr>
<tr>
<td>Industry dummy 5.q1_4</td>
<td>0.57**</td>
<td>0.39*</td>
<td>0.31</td>
</tr>
<tr>
<td></td>
<td>(0.212)</td>
<td>(0.191)</td>
<td>(0.189)</td>
</tr>
<tr>
<td>Industry dummy 6.q1_4</td>
<td>0.48</td>
<td>0.23</td>
<td>0.19</td>
</tr>
<tr>
<td></td>
<td>(0.493)</td>
<td>(0.436)</td>
<td>(0.426)</td>
</tr>
<tr>
<td>Industry dummy 7.q1_4</td>
<td>1.15**</td>
<td>0.97**</td>
<td>0.88**</td>
</tr>
<tr>
<td></td>
<td>(0.377)</td>
<td>(0.334)</td>
<td>(0.329)</td>
</tr>
<tr>
<td>Industry dummy 8.q1_4</td>
<td>0.21</td>
<td>-0.06</td>
<td>-0.13</td>
</tr>
<tr>
<td></td>
<td>(0.689)</td>
<td>(0.608)</td>
<td>(0.595)</td>
</tr>
<tr>
<td>Industry dummy 9.q1_4</td>
<td>0.19</td>
<td>0.08</td>
<td>0.05</td>
</tr>
<tr>
<td></td>
<td>(0.157)</td>
<td>(0.139)</td>
<td>(0.137)</td>
</tr>
<tr>
<td>Firm size (log)</td>
<td>0.17*</td>
<td>0.14*</td>
<td>0.16**</td>
</tr>
<tr>
<td></td>
<td>(0.069)</td>
<td>(0.062)</td>
<td>(0.061)</td>
</tr>
<tr>
<td>National operations</td>
<td>-0.89***</td>
<td>-0.71***</td>
<td>-0.72***</td>
</tr>
<tr>
<td></td>
<td>(0.154)</td>
<td>(0.139)</td>
<td>(0.136)</td>
</tr>
<tr>
<td>Absorptive capacity</td>
<td>0.29**</td>
<td>0.33**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.111)</td>
<td>(0.110)</td>
<td></td>
</tr>
<tr>
<td>HR practices</td>
<td>0.35**</td>
<td>0.40***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.111)</td>
<td>(0.110)</td>
<td></td>
</tr>
<tr>
<td>Absorptive capacity* HR practices</td>
<td></td>
<td></td>
<td>0.31*</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.127)</td>
</tr>
<tr>
<td>Constant</td>
<td>2.65***</td>
<td>2.63***</td>
<td>2.52***</td>
</tr>
<tr>
<td></td>
<td>(0.447)</td>
<td>(0.394)</td>
<td>(0.388)</td>
</tr>
<tr>
<td>Observations</td>
<td>126</td>
<td>126</td>
<td>126</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.368***</td>
<td>0.519***</td>
<td>0.545***</td>
</tr>
<tr>
<td>Adj. R-squared</td>
<td>0.30</td>
<td>0.46</td>
<td>0.49</td>
</tr>
</tbody>
</table>

Note: N=126, Standard errors in parentheses, *** p<0.001, ** p<0.01, *
Figure 1: The moderating effect of HR practices on the relationship between absorptive capacity and innovation.