Open innovation in an emerging economy
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Abstract
Purpose – The purpose of this paper is to examine the performance of firms in Peru in relation to open innovation.

Design/methodology/approach – Data were acquired through a survey of Peruvian middle and senior managers.

Findings – Peruvian firms engaged in open innovation did report higher sales growth. The study indicated that involvement in open innovation included activities to reduce operating costs and improve internal processes, as well as exploiting the process to assist the development of new or improved products.

Practical implications – The practical implications of this paper, although restricted to Peruvian organizations, suggest that firms operating in an emerging economy may find involvement in open innovation which is an effective strategy for enhancing organizational performance.

Originality/value – The originality of the paper is the focus on open innovation in an emerging economy.

Keywords Open innovation, Emerging economy

Paper type Research paper

Introduction
A decade of political stability, macro-economic caution and the pursuit of free trade have enabled Peru to emerge as one of the strongest economies in Latin America (De Althaus, 2007; The Economist, 2009). As with many other emerging nations in 2009 Peru was adversely impacted by the major downturn in the Western economies and a global decline in demand for commodities (Tello and Tavara, 2010). By 2010 improving global demand for minerals led to a return in economic growth in Peru. In May 2011, Peru’s economy was reported as achieving an annual growth rate of 7.1 percent (Dube, 2001). Nevertheless, there is no certainty that Peru will be able to sustain economic growth over the longer term. This is because the country’s exports are heavily reliant upon China’s continued need for minerals and other commodities (The Sunday Times, 2011; Fahy and Maptone, 2011).

Schumpeter’s (1934) concluded from his analysis of the Great Depression that the most effective strategy for surviving major economic uncertainty is for organizations to focus on exploiting innovation to enter new markets or develop new products. Drucker (1985) posited that post-war business survival rates in periods of economic uncertainty are likely to be highest among firms which engage in innovation. Other studies have also concluded that innovation which focuses upon creating new products and services will assist firms to emerge from an economic downturn in a much stronger position than their competitors who choose to cut costs or improve internal efficiencies (Hall, 1980; Gilbert, 1990; Goodell and Martin, 1992; Ghemawar, 1993; Trott, 1998). This viewpoint in relation to the current global economic downturn has recently been endorsed by a survey of over 1,000 CEOs of major businesses conducted by IBM (2008).
Chesbrough (2003) posited that firms in the twenty-first century are more likely to be successful by engaging in “open innovation”. This involves forming collaborative relationships with other organizations as the basis for achieving competitive advantage, primarily through the development of new or improved products. The majority of published research on open innovation has tended to focus upon the nature of the organizational processes associated with the management of external knowledge. As a consequence there still remains an important void in the literature; namely empirical validation of claims that open innovation enhances financial performance (Lichtenthaler, 2011). A similar view about the lack of empirical data concerning the impact of open innovation on financial performance was expressed by Gianiodis et al. (2010). In addition Colarelli O’Connor (2006) raised the issue of whether open innovation is more valid in certain industries than others, is equally relevant across all countries and the degree to which innovation activities are directed towards enhancing existing organizational processes versus seeking to develop new products based upon radical innovation.

These various question raised by these researchers would indicate there is a need to empirically assess whether open innovation does lead to improved organizational performance and whether theories concerning the benefits of open innovation are as equally applicable in firms based in an emerging economy. The purpose of this study is to examine these questions in the context of the performance and role of open innovation among firms located in Peru.

Innovation management
The early focus of research on new product management was on internal processes and how market success could be increased through the effective management of these processes. This research led to general acceptance of the benefits of utilizing a standard, stage gate, linear new product management model (Cooper, 1994; Cooper and Kleinschmidt, 1995). The model did assume that usually all phases of the innovation process occurred inside a single organization. By the mid-1990s, firms in developed economies were beginning to question the traditional approach to innovation of seeking to retain ownership of proprietary knowledge and working in isolation during the development of new products. Growing evidence emerged of the proven success of adopting a collaborative orientation towards innovation (Dyer and Singh, 1998). A key reason for increasing acceptance of adopting a collaborative approach is this can generate new knowledge which when linked with existing understanding and business experience, results in the generation of new ideas that often challenge prevailing conventions within an industry (Oguz, 2001).

At the beginning of the twenty-first century, as more organizations moved towards collaborating with each other to enhance the exploitation of innovation to achieve competitive advantage, Chesbrough (2003) coined the phrase “open innovation”. Chesbrough (2007) noted that not all companies utilize the same approach to open innovation and suggested the process can best be described as existing on a continuum ranging from a low to a high degree of “openness”. Lichtenthaler (2008) concluded that the degree of openness seems to rise with the degree of emphasis on radical innovation. Huang et al. (2010) proposed that open innovation leads to business growth by permitting organizations to leverage more ideas from a variety of external sources.
In relation to the role of open innovation some studies have examined the issue of knowledge transfer in R&D alliances and the need to develop internal organizational capability to absorb new knowledge which has been acquired (Fosfuri, 2006). Other research has focused upon user innovation in the context of how firms collaborate with users in the external exploitation of new knowledge in the development of new products (Bogers et al., 2010). Another field of research has addressed the relevance of business models in terms how open innovation enhances or accelerates the innovation process (West and Lakhani, 2008).

As noted by Lichtenthaler (2011) many of these studies have been of a qualitative nature, often focusing upon the activities of a single firm. Nevertheless, the assumption of many researchers has been that open innovation enhances organizational performance. This perspective provides the basis for the following hypothesis:

**H1.** Business performance will be higher among firms involved in open innovation.

The purpose of open innovation

Christensen et al. (2005) concluded open innovation is influenced by a number of different factors. These include:

1. the position of a firm in the market system;
2. the position of a firm’s products or services on the product life cycle curve; and
3. the scale of added value available through the introduction of new production technologies.

Elmquist et al. (2009) proposed that open innovation is usually distributed among a larger number of different actors. Birkinshaw et al. (2011) noted the management of these numerous relationships can mean the cost of open innovation will be extremely high.

Freel (2006) defined open innovation as any process associated with the use of external collaboration to assist the development of more successful new products or new production technologies. This view can be contrasted with that of Lazzarotti et al. (2010) who took a narrower view of what constitutes open innovation in their research study of Italian manufacturers. These researchers used cluster analysis to examine the two dimensions of the degree with which firms:

1. share information with a large number of organizations; and
2. the involve others in all aspects of their new product development activities.

On the basis of their analysis, Lazzarotti et al. (2010) proposed that the term open innovation should only be used to refer to firms which collaborate with large number of partners across all phases of the innovation process with the specific aim of developing new products. This perspective can be contrasted with Christensen et al. (2005) and Lichtenthaler (2011). Similar to Freel, these latter researchers perceive open innovation as a much broader concept. In their view any exchange of information between organizations which has the aim of enhancing performance through change in process or products should be considered as open innovation.

Both Kenworthy (1995) and Lundvall (1998) concluded that national and corporate culture can influence the willingness of organizations to collaborate with each other.
Gerard et al. (2009) examined collaboration between organizations in 17 different nations. In their view the two most critical factors influencing successful open innovation were corporate culture and the scale of investment associated with developing appropriate expertise within the firm.

Kuratko et al. (1993) and Lundvall (1998) proposed the role of learning in successful open innovation involves acquiring new knowledge about facts, principles and capability. The very important role of new knowledge acquisition to support open innovation was also noted by Niehaves’ (2010), Mohannak (2007), Moensted (2010) and Ojala and Tyrväinen (2009). These researchers posited that access to new knowledge is critical in ensuring an adequate response to changing external environments. A similar perspective is reflected in Chesbrough et al.’s (2006, p. 1) definition that “open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation”.

Chen et al. (2006) proposed the highest priority in open innovation should be given to the acquisition and exploitation of new knowledge that permits the development of new products and services. Wang and Rafiq (2009) noted that where two or more organizations are engaged in collaboration which is focused on developing new products or services, all participants must be able to incorporate new knowledge from external sources into their vision and strategy for achieving ongoing success. Saussois (2003) suggested that the rapid increase in the use of information technology to store, analyze and access data has the potential to greatly assist inter-organizational knowledge sharing because this can support the rapid identification of new markets or new product opportunities. Lichtenhalter and Lichtenhalter (2009) in their analysis of the main benefits of engaging in open innovation proposed that organizations perceive the activity will provide access to new sources of external knowledge that will enhance their new product development activities. These various perspectives provide the basis for the following hypothesis:

\[
\text{H2. The primary focus of firms engaged in open innovation is upon developing new or improved products or services.}
\]

Emerging economies

Craig and Douglas (1997) noted that in emerging economies the tendency is for firms to compete on the basis of lowest possible price. This can result in firms within supply chains exhibiting an adversarial, transactional orientation. They suggested a move towards a more collaborative relationship only occurs once firms adopt strategies based upon differentiation. Batra (1997) noted that a key reason why firms are biased towards price-based competition is because the average consumer income in many emerging economies is relatively low and there is a high level of customer price sensitivity.

In those cases where a more collaborative orientation begins to appear within an emerging economy, this often occurs first among overseas firms which have entered the market (Appiah-Adu, 1998). The success achieved by these foreign firms by avoiding the creation of adversarial relationships may lead domestic companies to begin to recognize the benefits of greater inter-firm collaboration. Arnold and Quelch (1998) noted that foreign firms should accept that the transfer of long established marketing practices used in developed economies will take time to occur in an emerging economy. This is because both customers and suppliers need to acquire the new competences required for adopting a new approach in the management of the marketing process.
In relation to new product management in emerging economies, Mu et al. (2007) concluded that in China many firms are still only at the stage of accepting the benefits of a stage gate approach to the management of process. This means that emphasis remains focused on improving co-operation between different departments within the organization. As a consequence only the larger and more sophisticated companies have moved towards adopting process models involving external collaboration to enhance performance. Ren et al. (2010) also concluded that many Chinese managers remain focused on how marketing innovation should be implemented across different levels within their own firms. Only a few companies have begun to exploit inter-firm relationships in order to identify new forms of competitive advantages based upon open innovation. Zou et al. (2010) examined growth strategies for firms in China. They concluded that few firms perceive the benefits of participating in business networks to assist the development of new products. They observed one exception to this conclusion is to be found among China’s high-tech firms. In this sector participation in networks has become an increasingly important factor in terms of influencing the success of companies’ new product development programmers.

Another key factor in terms of adopting a more collaborative orientation is the need for members of the supply chain in an emerging economy to perceive the benefits in moving away from relying upon traditional arms-length relationships. On the basis of their research in Vietnam, Tuang and Stringer (2008) concluded this shift will only occur when stronger trust and commitment develops between manufacturers and companies within a country’s distribution system. The speed with which developed economy marketing practices are adopted in emerging economies will vary. For example, in the case of the financial services industry in the Middle East, Appiah-Adu et al. (2001) found that many banks were still not exhibiting many of the factors which Kohli and Jaworski (1990) consider constitute evidence of a marketing orientation. In their comparison of marketing practices between North and South America, Pels et al. (2004) concluded that in South America the vast majority of firms use a limited mix of marketing practices to reach their primary customers. They identified a growing emphasis on relationship and network marketing practices, but these are not yet integrated into the marketing strategies used by most organizations. These perspectives provide the basis for the following hypothesis:

\[ H3. \] Few firms in an emerging economy will engage in open innovation.

**Research aims and methodology**

The increasing importance of India and China in the global economy has tended to cause these countries to be the prime focus of research on marketing practices in emerging economies. Hence there is less available evidence on the marketing processes in other countries such as those in South America. As noted by Dadzie et al. (2008) although many South American countries have faced periods of political instability, their economies are more advanced than in some other areas of the world such as Africa. This difference reflects the fact that South America has benefitted from:

- ongoing investments by American and European companies and financial institutions over the last 100 + years;
- the influence of being located near the USA; and
a regular inter-flow of citizens between the North and South American nations (Bacot et al., 2004).

As a consequence it seems reasonable to assume that domestic firms in countries such as Peru will have been influenced to a certain degree by management practices of organizations based in the developed nations.

Given that much of the literature on open innovation is based upon studies of firms located in developed economies, the question arises of whether theories concerning the importance of open innovation are as equally applicable in firms based in an emerging economy. The aims of this study are to examine this question in the context of the management of open innovation among firms in Peru.

The limited availability of commercial databases in Peru led to the decision to survey, middle and senior managers currently enrolled in the Catholic University of Lima’s post-graduate programmes in business administration in mid-2011. To assess organizational performance the study utilized the technique used by Chaston and Mangles (1997). This approach measures average sales growth over the last three years on a five point scale ranging from “sales declined by more than 10 percent” through to “sales increased by more than 10 percent”.

Most open innovation studies are of a qualitative nature (Van der Meer, 2007). This situation creates an obstacle for researchers because there is a lack of accepted survey tools for empirically assessing organizations’ involvement in open innovation. An exception to this generalization was a study undertaken by Lazzarotti et al’s (2010) of Italian firms. Their measurement of participation in open innovation involved examining the purpose, aims and rationale for involvement using a five point scale ranging from “strongly disagree” to “strongly agree.” The following questions provide the basis for calculating the overall mean of the level of open innovation within an organization:

(1) The purpose of open innovation involvement:
   - expand skills, competences or creativity;
   - expand the organization’s competence base;
   - increase idea generation capability; and
   - increase internal flexibility of the organization.

(2) The aims of open innovation involvement:
   - reduce or share the risks of innovation; and
   - reduce or share the costs of innovation.

(3) The rationale for involvement in open innovation:
   - achieve technological leadership;
   - improve performance by means of innovation;
   - refine or revise products/services through innovation;
   - gain access to new expertise; and
   - focus greater emphasis on more radical forms of innovation.

Results
Usable responses were received from 239 individuals who as summarized in Table I, are employed in number of different industry sectors. A visual inspection of the data
indicated some degree of variation between sectors but an ANOVA to assess variation was not statistically significant at \( p < 0.05 \). This outcome led to the decision to use all of the usable responses in the analysis of performance and open innovation.

Cronbach \( \alpha \)s were calculated to test the reliability of the multiple measurement variables associated with assessing open innovation. All values were greater than 0.70. Hence all variables could be used to calculate the overall mean utilized in a regression analysis (Hair et al., 1998). The respective mean scores for purpose, aims and rational, were 3.29, 2.82 and 3.08, yielding an overall mean score for open innovation of 3.11.

A regression analyses of business performance in relation to involvement in open innovation was statistically significant at \( p < 0.05 \) (Table II).

Cluster analysis was undertaken to determine the type of innovation being undertaken by firms. The ANOVA for the cluster analysis generated a value of \( F = 2.972 \) which was significant at \( p < 0.05 \). A breakdown of the four types of innovation is provided in Table III.

A second cluster analysis was undertaken to examine whether the focus of innovation was to develop improved or new products versus cost reduction or improvement in internal processes. The ANOVA for the cluster analysis generated a value of \( F = 26.90 \) and was significant at \( p < 0.05 \). The cluster analysis generated four types of organization activity. These are summarized in Table IV.

### Conclusions and discussion

Regression analysis of business performance in relation to involvement in open innovation was statistically significant at \( p < 0.05 \). On the basis of this result it seems reasonable to propose this research supports \( H1 \) that “business performance will be higher among firms involved in open innovation”. Chesbrough (2007) proposed that sustaining business performance in the twenty-first century can be made more certain by firms engaging in collaboration with other organizations. This viewpoint is supported by the results from this current study; namely those organizations in Peru involved in open innovation did appear to enjoy higher business performance.

<table>
<thead>
<tr>
<th>Sector of employment</th>
<th>% of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture/fisheries</td>
<td>12.7</td>
</tr>
<tr>
<td>Mining/extractive industries</td>
<td>16.0</td>
</tr>
<tr>
<td>Retailing/distribution</td>
<td>12.5</td>
</tr>
<tr>
<td>Transportation</td>
<td>11.1</td>
</tr>
<tr>
<td>Information technology</td>
<td>8.9</td>
</tr>
<tr>
<td>Financial services</td>
<td>14.6</td>
</tr>
<tr>
<td>Media</td>
<td>5.8</td>
</tr>
<tr>
<td>Tourism/leisure</td>
<td>13.3</td>
</tr>
<tr>
<td>Other</td>
<td>5.1</td>
</tr>
</tbody>
</table>

**Table I.**

Respondents’ sectors of employment

<table>
<thead>
<tr>
<th>Regression analysis</th>
<th>Adjusted ( R^2 )</th>
<th>Mean square</th>
<th>( F )</th>
<th>( p )</th>
<th>( t )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisational performance in relation to involvement in open innovation</td>
<td>0.332</td>
<td>15.45</td>
<td>4.23</td>
<td>0.04</td>
<td>9.39</td>
</tr>
</tbody>
</table>

**Table II.**

Regression analysis results
On the basis of the data in Table III it would appear that only 25.4 percent of Peruvian firms specifically focus upon involvement in open innovation to develop new or improved products. Hence it would appear that this research is unable to validate H2 that “the primary focus of firms engaged in open innovation is upon developing new or improved products or services”. This conclusion would appear to be at variance with the prevailing view in the literature that the main benefit of engaging in open innovation is to assist organizations enhance their new product development activities (Lichtenthaler and Lichtenthaler, 2009). It should be noted, however, that this perspective is based upon studies of firms in developed economies. It may be the case that in countries such as Peru, organizations perceive the need not just to focus on new products to enhance performance, but also to concurrently upgrade other areas of their operations. Support for this latter viewpoint is provided by the fact that Table III indicated that for 27.1 percent of Peruvian firms engaged in open innovation, no particular aspect of innovation was identified as being more important than any other.

Table IV provides a breakdown of the nature of innovation activities within Peruvian firms and compares these results with those generated by Lazzarotti et al.’s study of Italian firms. The number of firms engaged in closed innovation was relatively similar for both countries (Peru 39.3 percent versus 36 percent in Italy). More firms in Peru...
participated in limited external collaboration with a small number of partners (17.6 percent versus 9 percent in Italy) and also more firms were involved in a high level of external collaboration with many partners (33.5 percent versus 11 percent in Italy). Fewer Peruvian firms were involved in product innovation collaboration (20.8 percent versus 43.0 percent in Italy). However, the number of firms engaged in closed innovation was relatively similar for both countries (Peru 39.3 percent versus 36 percent in Italy). This latter result would appear to suggest this study is unable to support H3 that “few firms in an emerging economy will engage in open innovation”.

This conclusion is at variance with some of the other studies which have been undertaken on marketing practices in emerging nations. In China (Ren et al., 2010) and other emerging economies in Asia (Tuang and Stringer, 2008) researchers have concluded that open innovation is not widely utilized. Once possible reason for this difference between Asia and Peru is that suggested by Dadzie et al. (2008); namely South America countries are located nearer to the USA and hence are more likely to adopt practices which have proved beneficial to organizational performance of firms based in that part of the world.

**Management implications**

Entrepreneurship and importance of developing next generation products or services receives significant emphasis in university business and management studies programmers in the USA and Europe. To a certain degree this emphasis reflects the perspective that the survival of existing firms in a period of high economic uncertainty is dependent upon priority being given to sustaining competitive advantage through the development of radical new products (Gassmann et al., 2010). As noted by Naqshbandi and Sharan Kaur (2011), however academics and management practitioners do need to consider the context in which open innovation is being utilized and to assess the “appropriability” of this strategy in relation to market circumstances, performance goals and internal competences. The literature tends to present the view that the primary role of open innovation is that of supporting new product innovation. This perspective may be entirely valid in the case of Western nation firms facing increasing global competition. In view of the results generated by this current study for firms in Peru, an equally valid viewpoint could that for firms located in emerging economies open innovation also has an equally important role in reducing operating costs and enhancing internal organizational processes.

As demonstrated by Breznitz and Murphee’s (2011) study of organizational strategies of Chinese companies, differences in culture, economic strength and the political aims of industrialization in an emerging economy may lead to the evolution of business strategies and management practices somewhat at variance with new product management frameworks posited in the academic literature. These latter writings tend to focus upon managerial practices in Western nations; thereby indicating there may be a need for an expansion of management research concerned with organizational processes and practices in the world’s emerging economies. This current study sought to begin to address this shortfall, but certainly more studies in Peru and elsewhere in the world are needed. When such additional data become available then perhaps these will assist academics and marketing practitioners to avoid the temptation of assuming theories concerning the management of companies based in Western democracies will remain totally valid when applied to the management of firms elsewhere in the world.
References


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Further reading


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