This is a repository copy of *Entrepreneurial orientation pathways to performance: A fuzzy-set analysis*.

White Rose Research Online URL for this paper:
http://eprints.whiterose.ac.uk/91082/

Version: Accepted Version

**Article:**

https://doi.org/10.1016/j.jbusres.2015.10.099

© 2016. This manuscript version is made available under the CC-BY-NC-ND 4.0 license
http://creativecommons.org/licenses/by-nc-nd/4.0/

**Reuse**
Unless indicated otherwise, fulltext items are protected by copyright with all rights reserved. The copyright exception in section 29 of the Copyright, Designs and Patents Act 1988 allows the making of a single copy solely for the purpose of non-commercial research or private study within the limits of fair dealing. The publisher or other rights-holder may allow further reproduction and re-use of this version - refer to the White Rose Research Online record for this item. Where records identify the publisher as the copyright holder, users can verify any specific terms of use on the publisher's website.

**Takedown**
If you consider content in White Rose Research Online to be in breach of UK law, please notify us by emailing eprints@whiterose.ac.uk including the URL of the record and the reason for the withdrawal request.
Entrepreneurial orientation pathways to performance: A fuzzy-set analysis

Ana Lisboa, Instituto Politécnico de Leiria
Dionysis Skarmeas, Athens University of Economics and Business
Charalampos Saridakis, University of Leeds

Revision: August 2015

The authors thank George Baltas, Athens University of Economics and Business, and Constantinos Leonidou, University of Leeds, for their careful reading and suggestions. The authors also acknowledge the support of FCT (within the project UID/Multi/04044/2013) and Centre for Rapid and Sustainable Product Development (CDRsp-IPL). Send correspondence to Ana Lisboa, Escola Superior de Tecnologia e Gestão, Instituto Politécnico de Leiria, Campus 2 – Morro do Lena, Alto Vieiro, Apartado 4163, 2411-901 Leiria, Portugal (ana.lisboa@ipleiria.pt); Dionysis Skarmeas, Athens University of Economics and Business, Department of Marketing and Communication, 12 Derigny Str., Athens 10434, Greece (dskarmeas@aueb.gr); Charalampos Saridakis, Leeds University Business School, University of Leeds, Maurice Keyworth Building, Leeds LS2 9JT, United Kingdom (b.saridakis@leeds.ac.uk).
Abstract

Most prior research on entrepreneurial orientation (EO) aggregates its features into a gestalt construct to investigate its influence on firm performance. This study deconstructs EO into innovativeness, proactiveness, and risk-taking dimensions, and focuses on the causal mechanisms by which those factors collectively affect performance. By drawing on the resource-based view of the firm and its dynamic capabilities extension, the study identifies multiple paths of complex causal recipes that can lead to certain organizational capabilities, competitive advantages, and performance. To do that, the study uses fuzzy-set qualitative comparative analysis (fsQCA), a technique that provides a holistic view of the examined interrelationships, compared to traditional net effect approaches that assume symmetric and linear relationships among variables. The study provides key conclusions and insightful implications for managers and researchers.

Keywords: entrepreneurial orientation; exploitation; exploration; competitive advantage; performance; fuzzy-set qualitative comparative analysis.
1. **Introduction**

Firms are under constant pressure to develop new product offerings that match customer needs better than their competitors (Yalcinkaya et al., 2007). The literature suggests that adopting an EO may help firms in this regard (Soriano & Huarng, 2013). EO refers to the philosophy and decision-making processes that guide a firm’s activities, and encompasses values and behaviors such as innovativeness, proactiveness, and risk taking (Covin & Slevin, 1989).

Yet, although research provides substantial evidence relating EO possession to firm performance, little understanding exists of how EO influences performance (Zahra et al., 2006). Most studies merge the components of EO into a combined gestalt construct when examining its direct link to performance (Wu, 2013) or the role of mediating variables in this link (Li et al., 2010). However, a firm can simultaneously present high levels of innovativeness and/or proactiveness and relatively low levels of risk taking; such variances between the components are essential for understanding the role of EO in explaining firm outcomes (Hughes & Morgan, 2007).

Further, a review of the literature reveals that, although some studies examine the links between the different dimensions of EO and firm performance (Theoharakis & Hooley, 2008), no research investigates the alternative complex combinations (i.e., causal recipes) of the individual dimensions of EO that lead to high performance.

In seeking to address these shortcomings, this study draws on the resource-based view (RBV) and dynamic capabilities (DC) theories to investigate the multiple pathways of complex antecedent conditions by which EO components facilitate product-development capabilities, new-product advantage, and performance (Figure 1).
Figure 1 here.

2. **Theoretical background**

2.1. RBV theory

The RBV theory envisions the firm as a unique combination of resources and capabilities, which serve as sources of competitive advantage and superior performance (Peteraf, 1993). Resources are tangible or intangible assets that firms use to conceive of and implement their strategies (Peteraf, 1993); capabilities are embedded, complex bundles of skills and processes that enable firms to deploy resources (Eisenhardt & Martin, 2000).

EO refers to a firm’s strategic orientation, reflecting the decision-making styles, practices, and methods that direct its activities (Lumpkin & Dess, 1996). An entrepreneurial firm engages in product-market innovation, assumes risks, and has an opportunity-seeking perspective (De Clercq & Zhou, 2014). Accordingly, the core components of EO are innovativeness, proactiveness, and risk taking (Covin & Slevin, 1989). Innovativeness reflects the firm’s tendency to embrace new ideas, favor change, and encourage experimentation (Hurley & Hult, 1998). Proactiveness conveys a forward-looking perspective that aims to spot, anticipate, and act on future market changes (Li et al., 2010). Risk taking reflects the firm’s willingness to take bold actions and devote resources to pursue opportunities with uncertain outcomes (Lumpkin & Dess, 1996). Thus, innovativeness, proactiveness, and risk taking embody a set of values and beliefs that shape how the firm intends to conduct business and compete (Hughes & Morgan,
As such, they serve as key strategic resources that guide the firm’s attempts to achieve superior performance.

2.2. DC theory

The DC theory suggests that possession of resources is a necessary but not sufficient condition for value creation (Newbert, 2007) and maintains that the capabilities through which firms develop and deploy resources, rather than resources per se, help create a competitive advantage and enjoy superior performance (Morgan, Vorhies, & Mason, 2009).

Exploration and exploitation capabilities can serve as the internal processes through which firms deploy innovativeness, proactiveness, and risk taking to match their market environment and facilitate the development of competitive advantage (Eisenhardt & Martin, 2000). Product-development explorative capabilities entail pursuing new product-development skills, processes, and knowledge, whereas product-development exploitative capabilities involve refining and extending existing product-development skills, technologies, and paradigms (Atuahene-Gima, 2005; Cui et al., 2014). Thus, product-development exploration and exploitation are the value-creating mechanisms that allow the firm to gain competitive advantage (Atuahene-Gima, 2005; Zahra et al., 2006).

2.3. New-product advantage and performance

This study focuses on two key features of new-product advantage: differentiation and speed to market. New-product differentiation refers to the quality and uniqueness of a firm’s product-development efforts (Ramaswani et al., 2009), and new-product speed to
market reflects the time efficiency of the firm’s product introduction into the market (Fang, 2008). To succeed in the highly competitive global-market environment, firms need not only to develop new offerings with features that are meaningful to customers but also to introduce them into the marketplace in a time-efficient way (Fang, 2008). New-product differentiation and speed to market are powerful determinants of firm performance (Yalcinkaya et al., 2007). Profitability, which refers to return on investment, return on sales, and profits, serves as an ultimate measure for firm performance and success (Vorhies & Morgan, 2005).

3. Method

3.1. Measures and sampling

The measures of innovativeness, proactiveness, and risk taking derived from Covin and Slevin’s (1989) work. The items used to measure product-development explorative and exploitative capabilities came from the studies by Atuahene-Gima (2005) and Yalcinkaya et al. (2007). The items used to measure new-product differentiation and speed to market originated from Ramaswami et al. (2009). Profitability items came from Vorhies and Morgan (2005).

This study focuses on manufacturing firms in Portugal. The random sample from the Portuguese National Statistics Institute database contained 2931 firms. The research team contacted all firms by telephone to check their eligibility, explain the study’s purpose, identify key informants, and check the accuracy of their email addresses. This process resulted in 1271 eligible firms. Then, the identified key informants received an invitation email requesting them to follow a link and participate in the survey. The online
survey consisted of an introductory page, an instruction page, four pages of questions, and an ending page. The initial email, together with two reminder emails (sent from the same email address), yielded 263 usable responses (20.69% response rate). Respondents commonly held senior-management positions, including managers (32%), chief executive officers (31%), and general managers (13%).

A comparison of respondents and a random group of 48 non-responding firms with respect to firm demographics showed no significant differences between the groups. Additionally, the results of Harman’s one-factor test suggest that common method bias is not a significant threat to the validity of this study.

3.2. Overview of fsQCA

Contrary to correlational methods, such as structural equation modeling (SEM), which estimate the net effect of an independent variable on a dependent variable, fsQCA identifies the conditions that lead to a given outcome (Cheng et al., 2013; Schneider et al., 2010; Stokke, 2007). In this way, fsQCA supplements conventional correlational analyses thanks to its three main advantages: (1) asymmetry (i.e., the relationships between independent and dependent variables are treated as asymmetric); (2) equifinality (i.e., multiple pathways lead to the same outcome); and (3) causal complexity (i.e., combinations of causal antecedent conditions lead to the outcome, and hence, the focus is not on net effects, but on combinatorial effects) (Fiss, 2011; Ganter & Hecker, 2014; Pajunen, 2008; Skarmeas et al., 2014).
4. Analysis

4.1. Measurement validation

The maximum likelihood estimation procedure in EQS assesses the validity of the measures. The measurement model results reveal a good fit ($\chi^2_{(709)} = 1506.86$, $p < 0.001$; NFI = 0.93; CFI = 0.96; IFI = 0.96; TLI = 0.95; RMSEA = 0.06). The study constructs have adequate composite reliability ($\rho > 0.79$) and average variance extracted ($\rho_{c(n)} > 0.56$) scores. The average loading size of each item on its intended construct is 0.80, which provides evidence of convergent validity. In addition, all possible pairs of constructs passed Fornell and Larcker’s (1981) test of discriminant validity.

4.2. Implementing fsQCA

Table 1 presents the derived complex solutions that illustrate the causal recipes (i.e., sufficient conditions), which lead to high membership in the five outcome conditions. Complex solutions, contrary to the parsimonious and intermediate solutions, make no simplifying assumptions (Elliott, 2013). After calculating the consistency scores for all possible complex causal combinations that lead to the five outcome conditions, a comparison with the usual cut-off consistency score of 0.80 follows. Combinations with consistency scores higher than this threshold remain in the final solution. Table 1 suggests that all five models (solutions) are rather informative. All consistency values are higher than 0.75 and most coverage values range between 0.25 and 0.65, as Woodside (2013) suggests.

Table 1 here.
4.2.1. Pathways to product-development exploration

Two pathways lead to high product-development exploration. The first one indicates that high innovativeness relates to high membership scores for product-development exploration. This pathway is fairly consistent (consistency =0.82) and explains a satisfactory amount of cases with high product-development exploration (coverage =0.77). The second pathway indicates that high proactiveness, with low risk taking also results in high product-development exploration. This pathway is slightly more consistent than the previous one (consistency =0.83), and explains a satisfactory amount of cases with high product-development exploration (coverage =0.45). The solution as a whole has a satisfactory consistency of 0.80 and a coverage of 0.83. Although high innovativeness is sufficient for high product-development exploration, no simple antecedent conditions (i.e., EO dimensions) are necessary for this outcome to occur.

4.2.2. Pathways to product-development exploitation

The solution for high product-development exploitation indicates two pathways. The first pathway suggests that high innovativeness and high proactiveness result in high product-development exploitation. Additionally, high innovativeness and high risk taking may also lead to high product-development exploitation. The solution is fairly consistent at 0.83, with a coverage value of 0.75. Innovativeness is a necessary (though not sufficient) condition for high product-development exploitation.

4.2.3. Pathways to new-product differentiation
Regarding new-product differentiation, the results suggest two pathways. The first one indicates that high innovativeness and high risk taking, with low product-development exploration and high product-development exploitation result in high new-product differentiation (consistency=0.89; coverage=0.31). The second pathway indicates that high innovativeness and low proactiveness, with high product-development exploration and high product-development exploitation may also lead to high new-product differentiation (consistency=0.89; coverage=0.36). The solution as a whole has high consistency of 0.87 and a satisfactory coverage of 0.43.

4.2.4. Pathways to new-product speed to market

The solution for new-product speed to market derived two pathways. The first one indicates that low innovativeness and high proactiveness, with low risk taking and high product-development exploration result in high new-product speed to market (consistency=0.89; coverage=0.33). The second pathway indicates that high innovativeness and low risk taking, with low product-development exploration and high product-development exploitation can also lead to high new-product speed to market. The second pathway is more consistent (consistency=0.90) and explains a satisfactory amount of cases (coverage=0.31). Overall, the solution has a high consistency of 0.88 and a satisfactory coverage of 0.40.

4.2.5. Pathways to profitability

The model examining high profitability suggests four pathways. The first one indicates that if all three EO components are high, and product-development exploration
with product-development exploitation are also high, along with low new-product speed to market, profitability will be also high (consistency=0.92; coverage=0.32). The second pathway indicates that high innovativeness, high risk taking, high product-development exploration, high product-development exploitation, along with high new-product differentiation and high new-product speed to market, will also result in high profitability (consistency=0.92; coverage=0.37).

Also, the derived pathways suggest that, under certain conditions, low innovativeness may also lead to high profitability (see the third and fourth pathways). For example, low innovativeness, low proactiveness, low product-development exploration, low product-development exploitation, and low new-product speed to market, may lead to high profitability, as long as risk taking and new-product differentiation are high (third pathway-consistency=0.91; coverage=0.24). Finally, low innovativeness and low risk taking may also lead to high profitability, provided that proactiveness, product-development exploration, product-development exploitation, new-product differentiation, and new-product speed to market are all high (fourth pathway-consistency=0.94; coverage=0.23). The solution as a whole has a high consistency of 0.89 and a very satisfactory coverage of 0.53.

4.3. Illustration of SEM results

Table 2 presents relevant results of a supplementary analysis of the proposed research model using SEM. Innovativeness positively relates to product-development exploitation ($\beta = 0.43$, $p<0.01$). Innovativeness and risk taking positively relate to product-development exploitation ($\beta = 0.39$, $p<0.00$ and $\beta = 0.19$, $p<0.01$, respectively).
In addition, innovativeness and product-development exploration positively relate to new-product differentiation ($\beta = 0.43$, $p< 0.00$ and $\beta = 0.30$, $p< 0.01$, respectively), whereas product-development exploitation negatively relates to new-product differentiation ($\beta = -0.29$, $p< 0.01$). Proactiveness positively relates to new-product speed to market ($\beta = 0.30$, $p< 0.01$), whereas risk taking negatively relates to new-product speed to market ($\beta = -0.20$, $p< 0.05$). Finally, proactiveness, and product-development exploitation positively relate to profitability ($\beta = 0.26$, $p< 0.05$ and $\beta = 0.35$, $p< 0.00$, respectively).

Table 2 here.

5. Discussion and conclusion

SEM can merely show the existence of a statistically significant, monotonically increasing or decreasing relationship between two variables. However, net effects do not reflect all aspects of reality because, in any given dataset, not all cases support an exclusive negative or positive relationship between the independent and the dependent variables (Woodside, 2013). Table 3 illustrates the recipes that associate with high membership scores in the five outcome conditions.

Table 3 here.

Regarding the influence of EO dimensions on product-development exploration, the solution suggests that high innovativeness is a sufficient (though not necessary) condition for high product-development exploration. Interestingly enough, the results also suggest that even a low risk-taking firm, which is less willing to take bold actions, may also have high product-development explorative capabilities, as long as the firm
simultaneously behaves in a proactive, forward-looking manner. Indeed, a forward-looking, proactive firm, which spots, anticipates, and acts timely on future market changes, may compensate for its low risk-taking behavior, and therefore develop product-development explorative capabilities.

Regarding the influence of EO dimensions on product-development exploitation, innovativeness is a necessary, though not sufficient condition (as opposed to the finding for explorative capability). High levels of product-development exploitative capabilities require innovation’s combination with either a proactive or a risk-taking posture. Again, the results reveal the existence of a substitute relationship between a forward-looking and a risk-taking behavior.

Conventional wisdom assumes that an entrepreneurial posture facilitates only discovery-led activities. However, firms that adopt a combination of innovative and proactive posture or a combination of innovative and risk-taking posture can also develop an incremental type of firm innovation. The firm’s openness to new ideas, products, or processes acts as a springboard to invest in product-enhancing technologies and progressive improvements in product quality. The proactive posture sets the stage for firm action and renewal of existing product skills and knowledge. Further, the risk-taking posture enables the firm to take bold actions and devote resources to refine and extend its current knowledge bases and routines. Thus, the results show that under certain conditions, all three dimensions of EO provide an enriching environment for product-development exploitation.
Taken together, the pattern of results supports the argument that treating EO as a multidimensional construct makes sense. Indeed, different combinations of EO dimensions lay the foundation for different types of product-development capabilities.

Regarding the antecedent conditions for new-product differentiation, the results suggest two causal recipes. High innovativeness and high product-development exploitation appear in both recipes. An innovative posture, combined with exploitative capabilities, is a necessary (though not sufficient) condition for high new-product differentiation advantage. The influence (positive or negative) of product-development explorative capabilities on new-product differentiation seems to depend on the combination of additional antecedent conditions. More specifically, the results suggest that a high risk-taking posture can counterbalance a firm’s low explorative capability, and therefore lead to high new-product differentiation advantage (first pathway). Alternatively, the merits of a firm’s high explorative capability can compensate for a low proactive posture, and also lead to high new-product differentiation advantage (second pathway). The results reveal a non-linear relationship between product-development explorative capabilities and new-product differentiation advantage, with the moderating action of the firm’s EO posture (i.e., pro-active or risk-taking). These findings provide new insights into the existing literature, which so far acknowledges exploration, by promoting discovery and experimentation of new ideas, as a necessary source of differentiated, unique products (Yalcinkaya et al., 2007).

Contrary to the antecedent conditions for new-product differentiation, innovative posture is not a necessary condition for new-product speed to market. Low innovativeness can lead to new-product speed to market advantage if the firm combines a
highly proactive posture with product-development explorative capabilities. However, if innovativeness is high, a firm can achieve a new-product speed to market advantage, even if the firm has low product-development explorative capabilities. Also, the results indicate that low risk taking is the only necessary (though not sufficient) simple antecedent condition for high new-product speed to market, because this condition appears in both pathways. Yet, the expected positive effects of product-development exploration and product-development exploitation on new-product speed to market depend on the combination of additional antecedent conditions that occur in specific causal recipes. Again, fsQCA reveals the existence of asymmetric relationships among variables. Firms can counterbalance the disadvantage of low explorative capabilities in experimenting on new alternatives by adopting an innovative posture that favors creativity. By virtue of favoring change and improving existing product skills and technologies, firms can achieve time synergies and benefits from prompt introduction of enhanced products into the market.

Finally, the results reveal multiple configurations to high profitability. The derived pathways suggest that (i) no necessary simple antecedent conditions exist for high profitability and (ii) EO dimensions, product-development capabilities, and new-product advantages can contribute either positively or negatively to profitability depending on the combination of simple antecedent conditions that occur in any given recipe. For example, literature suggests that both new-product differentiation and new-product speed to market have beneficial effects on firm performance (Sheng et al., 2013). The study findings show that new-product differentiation can lead to high profitability under certain conditions; however, this competitive advantage may not be necessary (first
pathway). Regarding new-product speed to market, two of the pathways suggest a beneficial effect on profitability, whereas two other pathways reveal a deleterious effect. The findings on EO components and product-development capabilities suggest similar conclusions. Managers operating in complex environments can achieve high profitability through several pathways comprising different combinations and levels of EO dimensions, product-development capabilities, and new-product advantages. FsQCA reveals new patterns in the dataset, beyond the obvious net effects of regression-based techniques, and therefore provides information that is of greater value to managers and researchers.
References


Table 1. Complex solutions for the outcome conditions

<table>
<thead>
<tr>
<th>COMPLEX SOLUTION</th>
<th>Raw Coverage</th>
<th>Unique Coverage</th>
<th>Consistency Coverage</th>
</tr>
</thead>
</table>

Product-development exploration findings

Model: \( f_{explorat} = f(f_{innovat}, f_{proact}, f_{risk}) \)

<table>
<thead>
<tr>
<th>Term</th>
<th>Raw Coverage</th>
<th>Unique Coverage</th>
<th>Consistency Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>( f_{innovat} )</td>
<td>0.772488</td>
<td>0.381454</td>
<td>0.820427</td>
</tr>
<tr>
<td>( f_{proact} \cdot \neg f_{risk} )</td>
<td>0.451221</td>
<td>0.060187</td>
<td>0.827299</td>
</tr>
</tbody>
</table>

solution coverage: 0.832675; solution consistency: 0.796893

frequency cutoff: 10.000000; consistency cutoff: 0.853007

Product-development exploitation findings

Model: \( f_{exploita} = f(f_{innovat}, f_{proact}, f_{risk}) \)

<table>
<thead>
<tr>
<th>Term</th>
<th>Raw Coverage</th>
<th>Unique Coverage</th>
<th>Consistency Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>( f_{innovat} \cdot f_{proact} )</td>
<td>0.688088</td>
<td>0.090097</td>
<td>0.835917</td>
</tr>
<tr>
<td>( f_{innovat} \cdot f_{risk} )</td>
<td>0.659544</td>
<td>0.061553</td>
<td>0.851292</td>
</tr>
</tbody>
</table>

solution coverage: 0.749641; solution consistency: 0.824159

frequency cutoff: 10.000000; consistency cutoff: 0.854590

New-product differentiation findings

Model: \( f_{npdiffer} = f(f_{innovat}, f_{proact}, f_{risk}, f_{explorat}, f_{exploita}) \)

<table>
<thead>
<tr>
<th>Term</th>
<th>Raw Coverage</th>
<th>Unique Coverage</th>
<th>Consistency Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>( f_{innovat} \cdot f_{risk} \cdot \neg f_{explorat} \cdot f_{exploita} )</td>
<td>0.312468</td>
<td>0.066545</td>
<td>0.894682</td>
</tr>
<tr>
<td>( f_{innovat} \cdot \neg f_{proact} \cdot f_{explorat} \cdot f_{exploita} )</td>
<td>0.359195</td>
<td>0.113272</td>
<td>0.890339</td>
</tr>
</tbody>
</table>

solution coverage: 0.425740; solution consistency: 0.873912
New-product speed to market findings

Model: \( f_{npspeed} = f(f_{innovat}, f_{proact}, f_{risk}, f_{explorat}, f_{exploita}) \)
\begin{align*}
\sim f_{innovat} \ast f_{proact} \ast f_{risk} \ast f_{explorat} & \quad 0.334717 \quad 0.095773 \quad 0.890741 \\
f_{innovat} \sim f_{risk} \ast f_{explorat} \ast f_{exploita} & \quad 0.306113 \quad 0.067170 \quad 0.899734
\end{align*}
solution coverage: 0.401887; solution consistency: 0.882645

frequency cutoff: 1.000000; consistency cutoff: 0.901635

Profitability findings

Model: \( f_{profit} = f(f_{innovat}, f_{proact}, f_{risk}, f_{explorat}, f_{exploita}, f_{npdiffer}, f_{npspeed}) \)
\begin{align*}
f_{innovat} \ast f_{proact} \ast f_{risk} \ast f_{explorat} \ast f_{exploita} \ast \sim f_{npspeed} & \quad 0.320047 \quad 0.064764 \quad 0.922484 \\
\sim f_{npspeed} & \\
f_{innovat} \ast f_{risk} \ast f_{explorat} \ast f_{exploita} \ast f_{npdiffer} \ast f_{npspeed} & \quad 0.367042 \quad 0.097077 \quad 0.916881 \\
r \ast f_{npspeed} & \\
\sim f_{innovat} \sim f_{proact} \sim f_{risk} \sim f_{explorat} \sim f_{expl} \sim f_{npdiffer} \sim f_{npspeed} & \quad 0.243757 \quad 0.050014 \quad 0.905916 \\
\sim f_{innovat} \ast f_{proact} \sim f_{risk} \ast f_{explorat} \ast f_{exploit} & \\
a \ast f_{npdiffer} \ast f_{npspeed} & \quad 0.229624 \quad 0.028540 \quad 0.936486
\end{align*}
solution coverage: 0.531284; solution consistency: 0.891550

frequency cutoff: 4.000000; consistency cutoff: 0.905916
Table 2. SEM results

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Standardized estimate</th>
<th>(t-value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovativeness→Product-development exploration</td>
<td>0.39 (4.32)*</td>
<td></td>
</tr>
<tr>
<td>Innovativeness→Product-development exploitation</td>
<td>0.43 (4.79)*</td>
<td></td>
</tr>
<tr>
<td>Innovativeness→New-product differentiation</td>
<td>0.43 (3.82)*</td>
<td></td>
</tr>
<tr>
<td>Innovativeness→New-product speed to market</td>
<td>-0.00 (-0.02)</td>
<td></td>
</tr>
<tr>
<td>Innovativeness→Profitability</td>
<td>-0.14 (-1.29)</td>
<td></td>
</tr>
<tr>
<td>Proactiveness→Product-development exploration</td>
<td>0.11 (1.13)</td>
<td></td>
</tr>
<tr>
<td>Proactiveness→Product-development exploitation</td>
<td>0.18 (1.89)</td>
<td></td>
</tr>
<tr>
<td>Proactiveness→New-product differentiation</td>
<td>0.14 (1.27)</td>
<td></td>
</tr>
<tr>
<td>Proactiveness→New-product speed to market</td>
<td>0.30 (2.51)*</td>
<td></td>
</tr>
<tr>
<td>Proactiveness→Profitability</td>
<td>0.26 (2.31)*</td>
<td></td>
</tr>
<tr>
<td>Risk-taking→Product-development exploration</td>
<td>0.19 (2.42)*</td>
<td></td>
</tr>
<tr>
<td>Risk-taking→Product-development exploitation</td>
<td>0.12 (1.53)</td>
<td></td>
</tr>
<tr>
<td>Risk-taking→New-product differentiation</td>
<td>0.01 (0.06)</td>
<td></td>
</tr>
<tr>
<td>Risk-taking→New-product speed to market</td>
<td>-0.20 (-2.18)*</td>
<td></td>
</tr>
<tr>
<td>Risk-taking→Profitability</td>
<td>-0.14 (1.49)</td>
<td></td>
</tr>
<tr>
<td>Product-development exploration→New-product differentiation</td>
<td>0.30 (2.95)*</td>
<td></td>
</tr>
</tbody>
</table>
Product-development exploration → New-product speed to market 0.08 (0.84)

Product-development exploration → Profitability 0.03 (0.35)

Product-development exploitation → New-product differentiation -0.29 (-2.74)*

Product-development exploitation → New-product speed to market 0.15 (1.65)

Product-development exploitation → Profitability 0.35 (3.27)*

New-product differentiation → Profitability 0.16 (1.86)

New-product speed to market → Profitability -0.04 (-0.57)

* p< 0.05.
Table 3. Configurations for achieving high levels of the outcome conditions.*

<table>
<thead>
<tr>
<th>Antecedent condition</th>
<th>Outcome condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovativeness</td>
<td>Product-development exploration</td>
</tr>
<tr>
<td></td>
<td>1st 2nd Conclusion</td>
</tr>
<tr>
<td>Proactiveness</td>
<td>Ø</td>
</tr>
<tr>
<td>Risk-taking</td>
<td>Ø</td>
</tr>
<tr>
<td></td>
<td>Ø</td>
</tr>
</tbody>
</table>

*Black circles indicate high presence of a condition, and white circles indicate low presence (i.e., absence) of a condition. Large black (white) circles indicate a core-necessary condition of presence (absence). “Ø” indicates a peripheral (not necessary) condition. Blank spaces in a pathway indicate “don’t care”.
Figure 1. Conceptual model

- Innovativeness
- Proactiveness
- Risk-taking

Product development exploration → New product differentiation
Product development exploitation → New product speed to market

Profitability