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Decision-making logics with regard to innovation strategy in stable and dynamic environments

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Contents

- Some definitions
- Motivation
- State of the art and modelling
- Data and method
- Estimation results
- Conclusion

Some definitions (1)

- Business strategy: A firm's plan to generate [persistently] economic profits based on lower cost, better quality, or new products. (Yang, Kueng & Hong, 2015).
- Strategic decisions: internationalization, innovation, mergers and acquisitions,..
- Innovation: “the carrying out of new combinations” (Schumpeter, 1963 [1911]).
- Innovation: “(1) The introduction of a new good – that is one with which consumers are not yet familiar – or of a new quality of a good. (2) The introduction of a new method of production, that is one not yet tested by experience in the branch of manufacture concerned, which need by no means be founded upon a discovery scientifically new, and can also exist in a new way of handling a commodity commercially. (3) The opening of a new market, that is a market into which the particular branch of manufacture of the country in question has not previously entered, whether or not this market has existed before. (4) The conquest of a new source of supply of raw materials or halfmanufactured goods, again irrespective of whether this source already exists or whether it has first to be created. (5) The carrying out of the new organisation of any industry, like the creation of a monopoly position (for example through trustification) or the breaking up of a monopoly position” (Schumpeter, 1963 (1911), p. 66; we emphasize).

Some definitions (2)

- Oslo Manual (OECD, 2018:20, 4th edition)

  - "An innovation is a new or improved product or process (or combination thereof) that differs significantly from the unit's previous products or processes and that has been made available to potential users (product) or brought into use by the unit (process)."
  - "Innovation activities include all developmental, financial and commercial activities undertaken by a firm that are intended to result in an innovation for the firm."
  - "A business innovation is a new or improved product or business process (or combination thereof) that differs significantly from the firm's previous products or business processes and that has been introduced on the market or brought into use by the firm."

Some definitions (3)

- Decision-making logics or reasonings of causation and effectuation.
- Causation: involves planning and prediction-oriented techniques to deal with or ‘control’ the future.
- Causation: where entrepreneurs start from a certain goal (e.g. ten per cent market share increase) and decide on developing a plan consisting of means application, such as market segmentation, to attain this goal. (Sarasvathy, 2001)
- Accordingly, an entrepreneur can (stochastically) predict the future through planning (Wiltbank et al. 2009), so that (s)he can proactively take controlled risks.
- [This coincides with what Mintzberg and Waters (1985) call a deliberate strategy: The company deliberately develops a goal, after which a strategy is being developed and implemented to attain this goal.

Some definitions (3)

- Example of causation: How to Make Chocolate Mousse

1. Whip egg yolks and sugar: In medium mixing bowl using an electric hand mixer whip together egg yolks and granulated sugar on high speed until pale and fluffy, about 2 minutes.

2. Heat 3/4 cup cream: Warm 3/4 cup of the heavy cream in a 2-quart saucepan on the stovetop over low heat until hot.

3. Temper eggs with cream mixture: While whisking egg mixture slowly pour in warm cream mixture to temper egg yolks. Then pour combined egg yolk and cream mixture back into saucepan.

4. Cook mixture to 160 degrees: Cook over low heat, whisking constantly, until mixture thickens just slightly and reaches 160 degrees on an instant read thermometer. If you notice any clumps strain through a sieve and return to saucepan.

5. Melt in chocolate: Off heat add in chocolate, stir until melted.

6. Let cool to room temp: Pour mixture into a clean medium bowl, cover and chill, stirring about every 10 – 15 minutes until it reaches 70 degrees (or no longer warm), about 30 – 40 minutes total.

7. Whip remaining cream, fold into chocolate mixture: Whip remaining heavy cream until very stiff peaks form. Fold whipped cream into chocolate mixture until combined.

8. Divide mixture among dessert cups, chill: Pipe or spoon into dessert cups. Chill 2 hours. Top with sweetened whipped cream if desired and garnish with shaved or grated chocolate.

Source: https://www.cookingclassy.com/chocolate-mousse/

Some definitions (4)

- Decision-making logics or reasonings of causation and effectuation.
- Effectuation: expert entrepreneurs often adopt an effectual logic. Instead of starting with a given goal, entrepreneurs reasoning in an effectual way start from a given set of means and make decisions based on their level of affordable loss, which is dependent upon the available resources (Sarasvathy 2001).

Some definitions (5)

- Example of effectuation:
- Late at home, you open the fridge and ask yourself: given what I have here, what could I prepare for dinner?

Motivation

- Causation, or planning, positively relates to an SME's innovativeness.
- But does a combination of causation and effectuation be advantageous, in particular in dynamic, changing contexts?
- Illustration: You have prepared a dish for you and for two friends, following the recipe. A third friend arrives unexpectedly. You can share with you four what you have prepared but each will not have enough.

- Or you can accommodate it by adding an improvised but complementary salad.

State of the art and modelling (1)

Causation logic or planning allows companies to anticipate information gaps, optimise resource flows, and control goal achievement. It accelerates and guides entrepreneurial activities such as product innovation and the subsequent organisation of the company to sell the new product (Delmar and Shane, 2003).

Similarly, decision-making happens in a much quicker and more efficient way when business planning is in place. This, in turn, positively relates to innovation success (Salomo, Weise, and Gemünden, 2007).

H1(+): A causal decision-making logic is positively related to a company's innovative performance.

State of the art and modelling (2)

Companies strictly sticking to plans are unable to undertake the necessary changes during company development (Brinckmann, Grichnik, and Kapsa 2010). They refrain from undertaking risks, and are less flexible and innovative, as portrayed in studies of strategic flexibility (Barringer and Bluedorn 1999), adaptability (Dean and Thibodeaux 1994) and innovative performance (Meeus and Oerlemans 2000).

Instead, an incremental strategy development approach (Brews and Hunt 1999) allows for increased entrepreneurial activities. The argument goes that next to planning, adopting a concurrent effectual decision-making logic might be necessary to be innovative (Andries, Debackere, and van Looy 2013).

H2(+): Effectuation amplifies the relationship between causation and innovative performance. A company simultaneously adopting a causal and an effectual decision-making logic is more innovative than a company only opting for a causal one.

State of the art and modelling (3)

Introducing the context.
It is more difficult to follow pre-defined strategic plans in uncertain environments (Mintzberg 2003) because, in such environments, entrepreneurs face unexpected contingencies (Fisher 2012). The argument goes that linear thinking and planning – which is inherently part of the causal decision-making logic – is better suited for stable environments characterised by certainty, as well as for predictable and routine circumstances (Vera and Crossan, 2004).

In contrast, in dynamic environments, business planning becomes ineffective because entrepreneurs face unexpected contingencies not accounted for in pre-defined plans (Fisher 2012; Mintzberg and Waters 1985; Suikki, Tromstedt, and Haapasalo 2006).

H3(-): Environmental dynamism negatively moderates the relationship between causation and innovative performance.

State of the art and modelling (4)

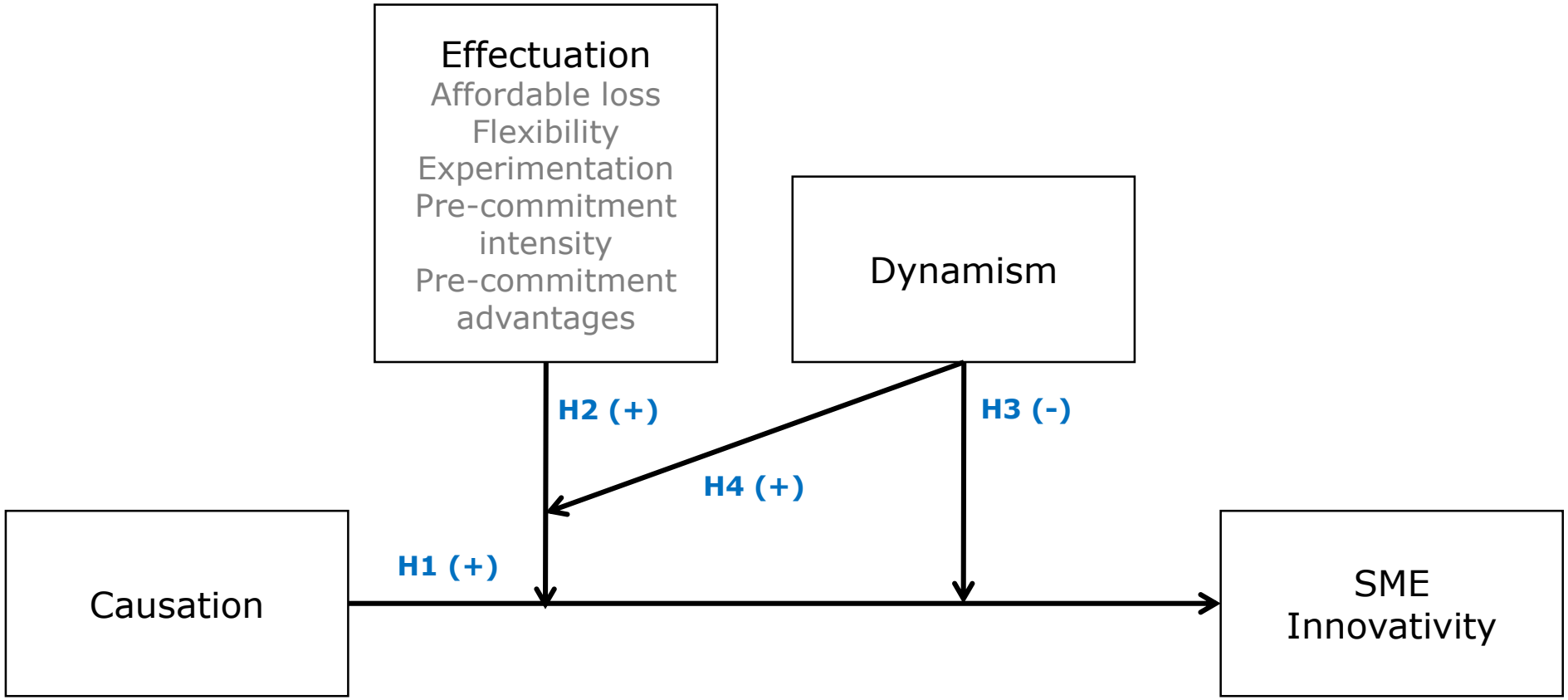
Hmieleski and Baron (2008) show that deviating from original plans leads to better performance, but only in dynamic environments. In such environments, flexible processes that adapt to contingencies are needed (Fisher 2012) for more innovativeness.

We posit that in a dynamic environment, the rigidity of a causal logic can be relaxed by simultaneously adopting an effectual one (Fisher 2012). In strategic management, this relates to the fact that companies simultaneously adopt deliberate and emergent strategies (Mintzberg and Waters 1985).

Combining causal and effectual logics as an imperative to be flexible, survive and stay entrepreneurial in dynamic environments.

H4(+): Environmental dynamism moderates the synergetic effect of a causal and an effectual decision-making logic on innovative performance. The more dynamic the environment is, the stronger is the positive effect of a concurrent focus on causation and effectuation.

State of the art and modelling (5)



Data and method

Innovativity

'In the last three years, my business has marketed very many new lines of products or service'

'In the last three years, changes in product or service lines have been usually quite dramatic'

Context Dynamism

The discontinuity and rate of change in the industry

'My company must change its marketing practices frequently (e.g. semi-annually)', 'The rate at which products / services are getting obsolete in my sector is very high', and *'The modes of production / service development change often in a major way'*

Effectuation (Chandler et al. 2011)

'We allowed the business to evolve as opportunities emerged' and 'The product / service that we now provide is substantially different than we first imagined'.

Causation (Chandler et al. 2011)

'We designed and planned business strategies' and *'We had a clear and consistent vision for where we wanted to end up'.*

Data and method

- Belgian Science Policy Project (BELSPO) - SMESESAP
  - Belgian SMEs
- Survey 1 - 2012
  - *IV: Effectuation, causation, context dynamism*
- Survey 2 - 2013
  - *DV*: *Innovativity*
- Total: 161 Belgian SMEs

Data and method

- **Linear regressions on Innovativity**
  - Bloc 1: **Control Variables**
    - Gender, Founder, Company age, Company size, Industry
  - Bloc 2: **Causation, Effectuation & Dynamism**
    - Each effectual dimensions tested separately
  - Bloc 3: **Simple interactions** (effectuation X causation ; causation X dynamism ; effectuation X dynamism)
  - Bloc 4: **Triple interaction** (effectuation X causation X dynamism)
- **Johnson-Neyman procedure (bootstrapping)**
  - Identification of the significativity intervals for the effects of the causal logic on the firm innovativity, for each level of the moderators (effectuation and dynamism)

Estimation results

The results show that causation is positively, consistently and significantly related to innovative performance.
We thus find strong support for *Hypothesis 1*.

Moreover, we find a significant moderation effect of effectuation for the aggregate construct, supporting *Hypothesis 2*.

We also find some support for *Hypothesis 3*, with consistent negative interaction effects between causation and environmental dynamism.

We do not find support for *Hypothesis 4*. The three-way interaction effect is not significant across the different regressions, except for pre-commitment advantages.

Figure 2: Two-way interaction between causation and effectuation

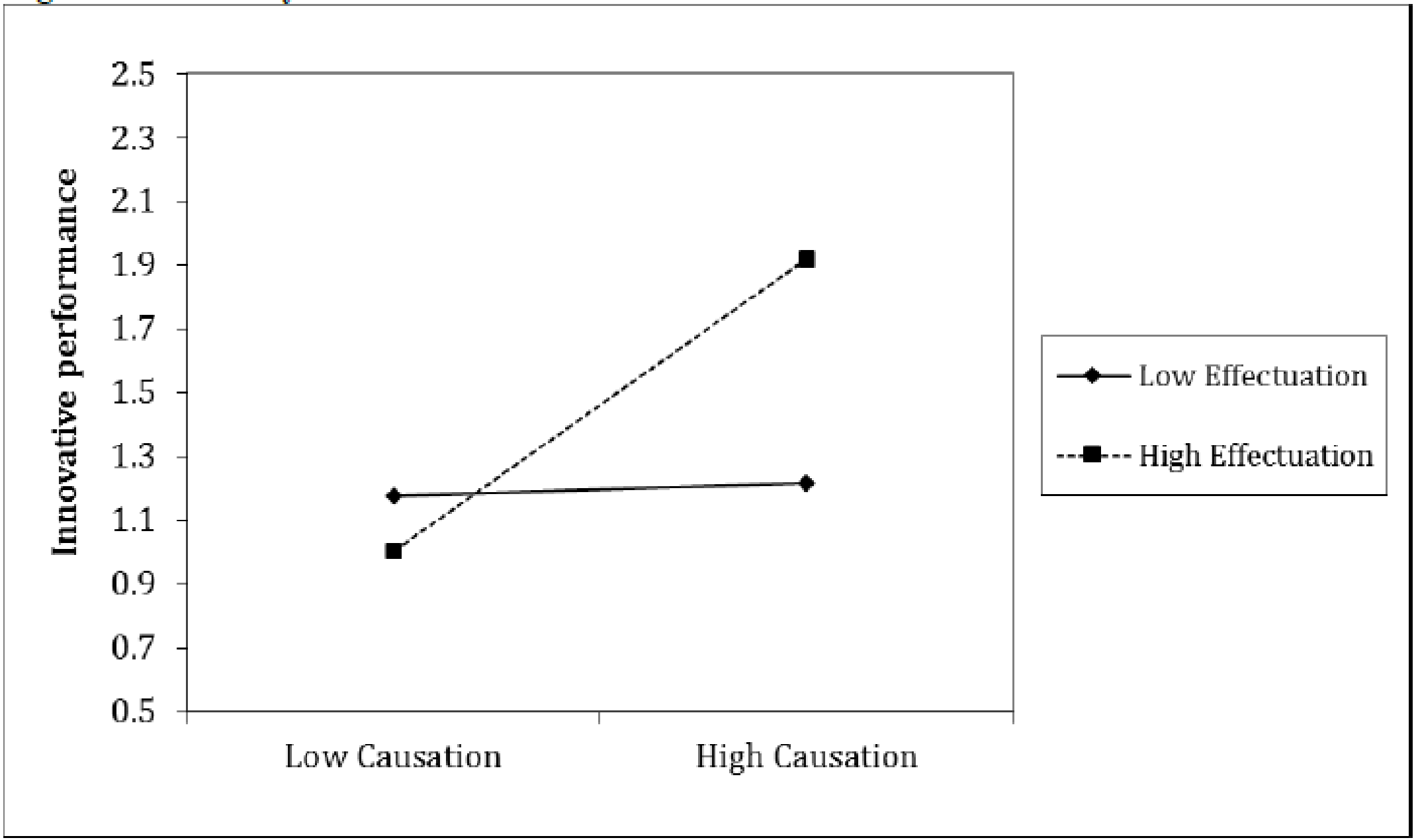


Figure 4: Two-way interaction between causation and environmental dynamism

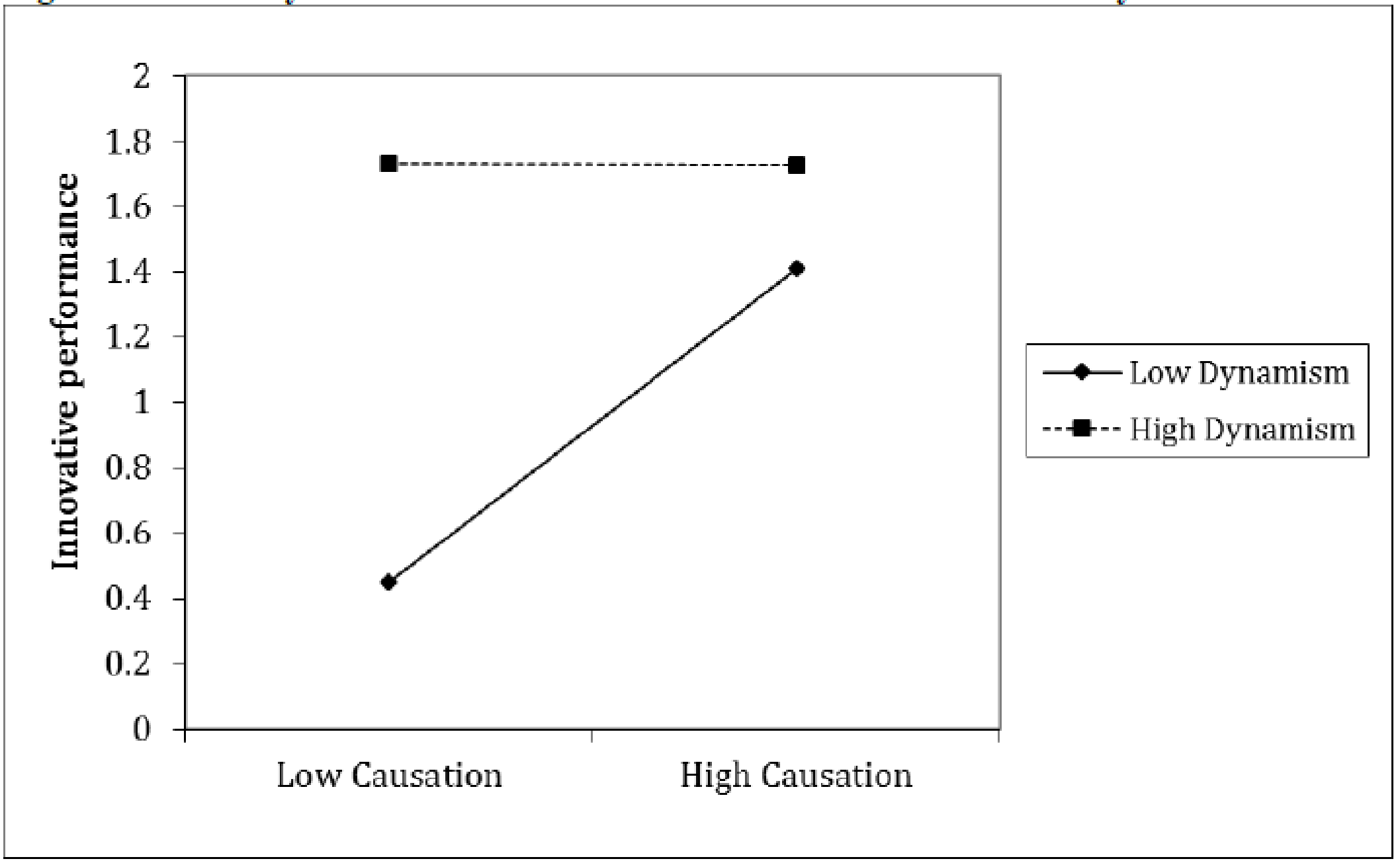
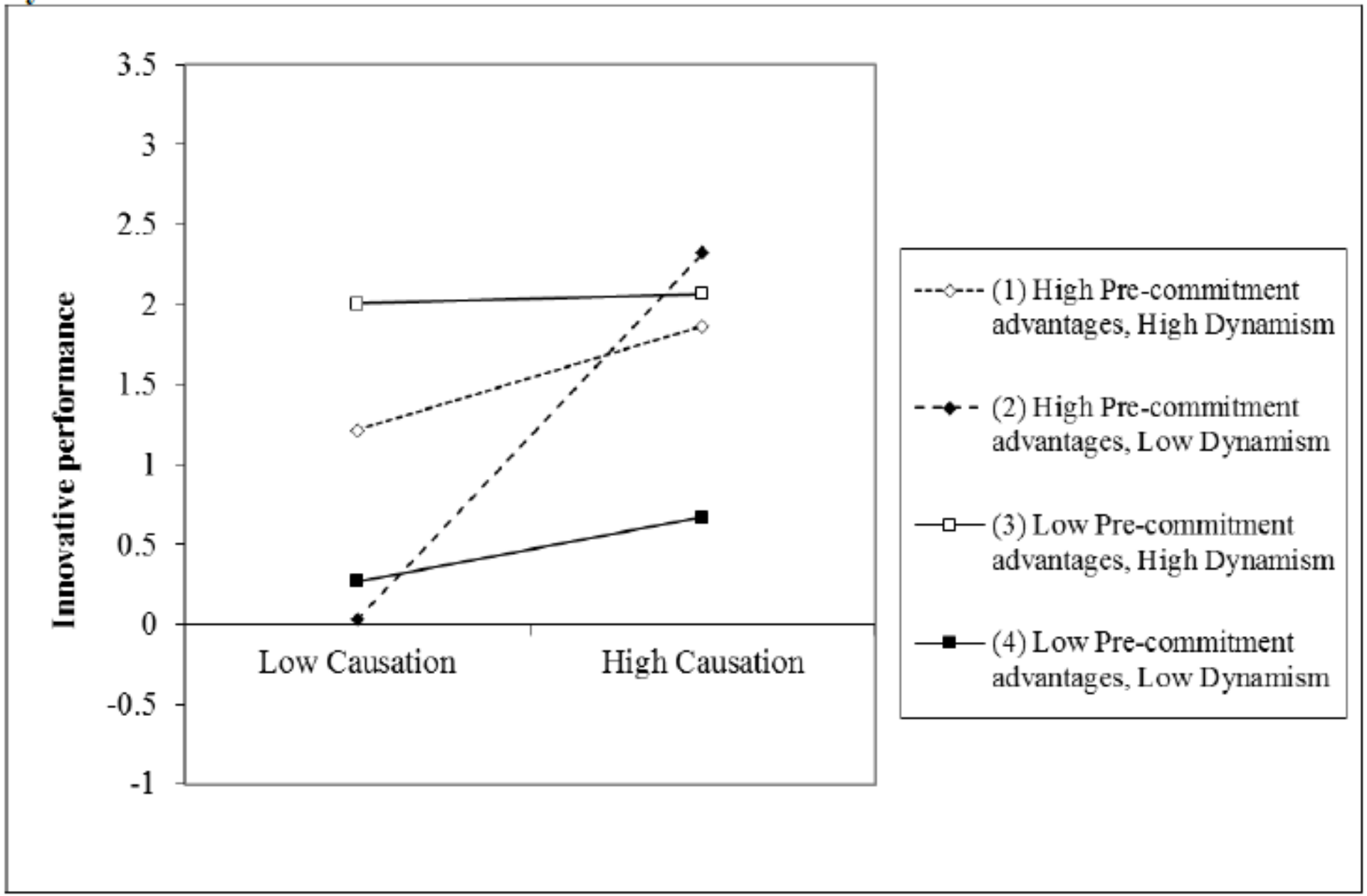


Figure 10: Three-way interaction between causation, pre-commitment advantages, and dynamism



Conclusion

- Causal logic is associated with more innovation in SMEs

  - when combined with an effectual logic
    (in particular in terms of pre-commitments of stakeholders)
  - in stable environments

- Identification of the limiting conditions for the use of causal logics in innovation.

- Research avenues:
  - How much pre-commitments is a construct shared with causation (Chandler et al. 2011)?
  - And in emerging economies?
  - Contextual dynamism. Uncertainty: rate of change and (un)predictability.

Thank you very much for your attention!

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