

Entrepreneurial Orientation and Open Innovation: Social Media as a Tool

Claudia Linde^(✉)

Institute of Entrepreneurship and Business Development,
Lübeck University of Applied Sciences, Lübeck, Germany
Claudia.linde@fh-luebeck.de

Abstract. The implementation of open innovation depends on the proclivity for open innovation. The proclivity for open innovation and its tool social media is an attitude of the management. One factor that could affect the proclivity for open innovation is the entrepreneurial orientation (EO). The aim of this paper is to give a literature review and to develop a theoretical concept for the relationship between the EO and the proclivity for open innovation. Special focus lies upon the application of social media as a tool for open innovation.

Keywords: Social media · Open innovation · Proclivity for open innovation · Entrepreneurial orientation · SME

1 Introduction

Innovations are a necessity for companies to be competitive [1]. Only approximately 10% innovations are successful on the market. Therefore, the economic risk of the company is very high. Furthermore, companies are in a rising competition. Products have a shorter product life, so the companies are required to develop new products and to innovate faster [2]. This could be a problem specifically for small and medium-sized enterprises (SME). SMEs have lower personal and financial resources in comparison to large companies [3]. As a result, SMEs do not always have the multidisciplinary competencies in-house which are essential to innovate [4].

The strategy open innovation could be used to counter these challenges. With this strategy the company opens up their innovation process [5] by using different tools and methods for the integration of external actors and also for the exploitation of intellectual property [6]. Social media is a tool for the integration of external actors which could be used for the communication, networking and collaboration with diverse parties like users, suppliers, corporate partners and stakeholders [7]. Social media is very fast and mostly low-cost relative to the amount of people reached [8]. With social media as a tool of open innovation companies could integrate users into the different phases of their innovation process [9]. Social media does not only reach one specific user, instead the company could integrate a greater amount of users. This could lead to a lot of ideas articulating the needs of the different types of users [10, 11]. The ideas developed by the users could be selected and refined by the employees of the company and also by the users [12]. This way of idea generation could reduce the uncertainty

about the market as well as the risk of failed innovation, the time of market launch and cost of R&D. Moreover, ideas generated by users could be more successful because they are based on the needs of the users and the market [10, 13]. Although social media could be a possibility to handle the limited resources of SMEs, only 15% of German speaking companies use social media as a tool of open innovation [9].

Whether the implementation of social media as a tool for open innovation could be successful depends on the ability of the company to adapt its innovation process and on an appropriate industry [14]. Both factors influence the ability of an organization to adapt its innovation process. This paper focusses on the internal factors. The internal factors could be barriers for the implementation of open innovation and its tool social media [14].

One barrier could be an inappropriate culture and structure. An open culture and structure are necessary for employees to accept the new strategy and the implementation of social media as a tool. The management of the company directly influence the culture of the company. So, it is important that management enables an open culture, structure and environment. Furthermore, managers have to support the implementation of open innovation [12, 15, 16] and therefore, the proclivity for open innovation is a fundamental attitude of management [17]. Thus, it can be assumed that the decision for the implementation of open innovation, and social media as a tool for open innovation depends on the proclivity for open innovation [17].

The factors that have an impact on the proclivity for open innovation of the management are understudied [18–20]. Examined factors are, for example, the effect of entrepreneurial orientation (EO) and job characteristics like skill variety, task identity and autonomy [18–20].

So far, there are few studies which investigate the effect of the EO on the proclivity for open innovation [19, 20]. On the basis of existing studies on EO [19, 20] it could be proposed that there is a direct relationship between the concept of EO and proclivity for open innovation. EO depends on the attitude of the management and their intention to take risks, promote innovations and behave proactively [21, 22]. The strategic processes like open innovation in the company could be influenced by EO [23].

The existing studies do not distinguish between companies in a service and manufacturing sector. Further moderating factors which may influence the EO and the proclivity for open innovation could be more considered. The evaluation of the impact of EO on the proclivity to implement tools is also missing [19, 20]. This paper concentrates on SMEs. For this companies could the implementation of open innovation a positive possibility to handle their limited resources. SMEs mainly implement the outside-in process of the three open innovation processes. Especially in this outside-in process social media is a possible tool.

The aim of this paper is the development of a theoretical concept for the relationship between the EO and proclivity for open innovation based on a literature review on proclivity for open innovation as well as its tool social media and EO. The special focus lies on the application of social media as a tool for open innovation.

2 Theoretical Background

2.1 Proclivity for Open Innovation and the Application of the Tool Social Media

The proclivity for open innovation refers to the potential and willingness of the management to open up its innovation process [17, 19, 20]. This could be defined by the predisposition and attitude of the management to the application and implementation of open innovation [17].

Open innovation is a strategy for innovation management [10] with the aim to expand the company's innovative capability and activities. The environment surrounding the company is strategically taken into account and integrated into the innovation process [24]. The opposite strategy is closed innovation where companies generate ideas internally and the innovation process is closed for the environment. Companies that use open innovation as a strategy could have the chance to get competitive advantages by combining internal and external know-how in a beneficial and economic way [5, 25]. Advantages are, for example, a better fit to the needs of the users, reduction of the R&D costs as well as the time-to-market [10]. Open innovation contains three main processes: outside-in, inside-out and coupled process. The outside-in process integrates external actors in the internal innovation process [24]. With the inside-out process, internal intellectual property (IP) would be exploited for example through venturing, licensing or spin-offs. The combination of integration of external actors as well as exploitation of internal IP is the coupled process [24]. Especially in the outside-in process social media could be an important tool for the integration of external actors [9].

Social media is increasingly used for the interaction and also collaboration with a crowd [9]. The tool includes social networks, mobile communities, blogs, open-source-platforms, etc. [7], which allows organizations to actively ask their customers about needs and ideas. Another way is to analyze the communication of users on different themes that are of interest for the company [26]. Furthermore, the company gets contact to lead users who could offer specific information for problem solutions. This offers the opportunity for companies to obtain special information about the needs of users. The needs refer to an absent product at the market as well as an obsolete offer of the company [10]. In this context users are called co-innovators [27]. They can be included in all phases of the innovation process from the idea generation, product development, creation of a prototype and product as well as market tests. In addition, users can also be involved in the marketing and distribution, for example through advertising by users. Due to the early involvement of users in the innovation process, the market risk is considerably lower than in closed innovation strategies [10].

Until now, research on the implementation of open innovation has been increasingly focused on organizational and structural requirements, such as the absorptive capacity of the organization [28]. Little research has been done on the proclivity for open innovation [17–20, 29]. The research of social media is limited to its application to innovation especially during the phase of ideation [12], the impact of social media on co-creation [26] and social media as a method of open innovation during the different phases of the innovation process [12]. So far, social media as a tool for open innovation

is hardly implemented in companies. Only 15% German speaking companies already use social media in R&D [9].

The decision to implement open innovation and apply social media in the open innovation process is commonly made top-down by management [16, 30]. Moreover, the configuration of organizational structures, processes and the innovation culture [31] as well as organizational innovations and strategic orientations are a responsibility of management [15]. The change of organizational structures and processes could only be successful if the management agrees with that change and pushes it forward [32]. Thus, only with a positive proclivity for open innovation management has the ability to apply open innovation and the tool social media [17].

The proclivity for open innovation depends on the attitude of management [17]. This raises the question of how the attitude of the management can be influenced so that they develop proclivity for open innovation. Factors which affect the proclivity for open innovation have been considered in fewer studies. One factor which affects the proclivity for open innovation is EO [19, 20]. EO is defined in the next section.

2.2 Entrepreneurial Orientation

The EO concept has its origin in strategic management. In the meantime, this concept is also of great importance in entrepreneurship [33]. The term EO was coined by Lumpkin and Dess [33, 34].

EO shapes the organization's policies and actions that enable entrepreneurial decisions and activities regardless of the age, size and sector of the company [35, 36]. Therefore, EO can be viewed as an entrepreneurial strategic process to achieve the vision and the generation of competitive advantages [35]. EO describes in which way a market entry with new products or services is implemented. Thus, it represents processes, activities and decision-making processes in which the new entry takes place [33].

EO is defined as entrepreneurial behavior [34] and depends on the degree to which the management is risk prone, open to innovation and behave proactively [21, 22]. Thus, an appropriate management personality can promote EO within the company [34], and consequently influence strategic processes in the organization [23]. This way, EO influences the degree of entrepreneurship throughout the organization [33].

According to Covin and Slevin [37], EO is characterized by three dimensions: innovation capability, the willingness to take risk and proactivity [37]. Innovation capability describes the ability of a company to pursue ideas and generate innovations [33], referring to different types of innovation. Companies with a high willingness to take risk are more likely to invest resources in projects with unknown results [38]. Proactivity marks a forward-looking attitude towards the pursuit of new opportunities, for instance entering new markets. This is contrary to passive behavior of a company, where no response to new possibilities is shown [33].

Existing research on the direct impact of EO on the proclivity for open innovation and the inside-out, outside-in and coupled-processes shows that EO has a positive effect on proclivity for open innovation [19, 20]. In studies to date, no distinction was made between different industry sectors. The sample of Ju et al. [19] consists of

manufacturing SMEs and SMEs in the service sector. The internal, as well as the external framework conditions could be different in various industries, where the effect of EO on proclivity for open innovation can vary depending on these conditions [35, 39]. These studies should be specified. A further question is the evaluation of the impact of EO on proclivity for implementation of tools like social media [19, 20].

In the next section, a theoretical framework for the relationship between EO and proclivity for open innovation as well as the application of social media in the innovation process is developed.

3 Development of a Theoretical Framework

So far, only a few studies have researched the effect of EO on the proclivity for open innovation [19, 20]. Until now, the effect of EO on the three processes of open innovation (outside-in, inside-out and coupled process) was investigated in only one study. A positive effect on the proclivity in all three processes could be demonstrated [19]. Based on the results, the authors assume that the pursuit of the open innovation strategy in companies with a high EO is more successful than in companies with a low EO [20].

A high EO could enable a strategic reorientation and support a cultural change within a company [33, 40]. So EO could influence the implementation of open innovation as a strategy for innovation management [10]. The implementation of open innovation requires a rethinking of innovation management and a change of strategy when the innovation process has been previously closed. The decision for strategic change is distributed top-down [35]. Managers with an EO assess innovations in a positive way and perceive them as solutions for a necessary change [41]. It is necessary to adapt organizational structures and processes for the implementation of the open innovation strategy, typical factors influenced by management [15]. Only with agreement of the management the adaption could be successful [32].

One dimension of EO is the innovation capability, describing the ability of a company to pursue ideas and generate innovations [33]. The implementation of open innovation requires a high ability to innovate new products and also to change the internal innovation process. The organization and their structure have to adapt to the new strategy [42].

The next dimension of EO is willingness to take risks. The implementation of open innovation and also social media requires a high degree of openness and also willingness to take risk in the company. The company should consider which know-how should be published or protected. Social media applications cannot be well controlled because social media is highly dynamic [9] and thus increases uncertainty as well a risk of losing know-how. The use of open innovation may lead to additional costs for the company due to the enforcement, implementation and control of open innovation [10]. Especially for SMEs, these costs can be a barrier due to limited available financial resources [43].

The third dimension of EO is proactivity of management. Organizations with proactive management tend to be more alert to market trends and review new opportunities for the company [23]. With the implementation of social media the company

could gain information about the needs of the users, for instance by could observing market trends. For successful implementation of open innovation, proactivity of management is required [17]. Proactivity is characterized by a forward-looking attitude towards the pursuit of new opportunities such as new market entries. Even if a company is not the first mover, it can be as proactive and innovative when it pursues new opportunities, take quick actions and react foresightedly [33]. This also relates to understanding and satisfaction of customer needs [44].

The dimensions of EO (innovation capability, the willingness to take risk and proactivity [37]) show attitudes of the management which could be seen as necessary for the implementation of open innovation. Therefore EO with the three dimensions (innovation capability, the willingness to take risk and proactivity [37]) could be seen as a precondition for the open innovation processes and as complementary strategies [19, 20].

On the basis of the existing studies on EO [19, 20] it could be proposed that there is a direct relationship between the concept of EO and the proclivity of open innovation. Although it cannot be assumed that all organizations implement open innovation and its three processes outside-in, inside-out and coupled process.

Most organizations implement the outside-in process [45]. Customers are primarily involved, followed by suppliers as well as governmental and commercial research institutes [46]. A study by van de Vrande et al. [43] shows that most SMEs involve their employees as a source of knowledge and their customers for knowledge generation. Rangus [17] assumes that employee integration, customer integration, external networking, and the outsourcing of R&D are relatively simple and appropriate activities to implement open innovation in SMEs [17, 29, 43].

Only a few SMEs implement formalized methods to use the inside-out process of open innovation [29, 43]. The reasons for this are the limited resources [3]. Frequently, they are unable to provide the necessary financing and contracts. Furthermore, it is common, that an innovation portfolio for risk compensation is not available. This refers to, for example, IP licensing, venturing and external investment [29, 43]. In order to identify and integrate innovations into the company, the company must employ appropriately qualified employees. In most cases SMEs do not have these employees. Another possibility is that they fear the loss of technological advantage. In the case of infringements of patents, SMEs have fewer opportunities to challenge them as do large companies [3].

The combination of the outside-in and the inside-out processes is the coupled process [24]. Based on the previous explanations it can be assumed that the implementation of the coupled process might be too complex for SMEs especially due to limited resources.

Therefore, it can be proposed that the EO has a positive effect on proclivity for open innovation within the outside-in, inside-out process and coupled process. But the application depends on the size and resources of the company.

Proposition 1: The EO of the management is positively related to the proclivity for open innovation in the context of the outside-in process.

Proposition 2: The EO is positively related to the proclivity for open innovation in the context of the inside-out process.

Proposition 3: The EO is positively related to the proclivity for open innovation in the context of the coupled process.

With social media as a tool for open innovation, companies could integrate users in the different phases of their innovation process. Especially in the outside-in process social media is an important tool for the integration of users. Each organization has to decide itself, to what extent innovation projects are useful for the application of open innovation tools. For this reason, consideration should also be given to the degree of openness of the company and thus to the publishing of internal know-how as well as IP via social media. Due to the possibilities of social media, the potential for know-how, creativity and the resulting possibility to generate innovation are endless [9]. Social media applications have high dynamics and cannot be completely managed and controlled [9], this requires a high degree of openness by the company and the management [28]. Companies operate under uncertainty and risk. Further risks can be the loss of know-how, an increased complexity in the process and also smaller differentiation from the competitors [46]. Therefore the management needs a high innovation capability, the willingness to take risk and proactivity, which are the dimensions of EO [37]. Furthermore, the proclivity for open innovation is necessary for the decision on the application of social media [17].

As a result, it can be proposed that EO and the proclivity for open innovation have a positive effect on the application of Social Media as a tool within the outside-in process and also in the coupled process.

Proposition 4: EO and the proclivity for open innovation are positively related to the application of social media within the outside-in process.

Proposition 5: EO and the proclivity for open innovation are positively related to the application of social media within the coupled process.

Open innovation cannot be implemented in every industry and company. It is necessary to examine whether the industry and thus the company is suited to adapt its innovation process to this approach [14]. Some industries are not suitable for an open innovation process, for example the military [10]. The internal as well as the external framework conditions could be different in various industries, whereby the effect of EO on the proclivity for open innovation varies, depending on these conditions [35, 39]. In the studies to date, no distinction was made between different sectors. For example Ju et al. [19] consider manufacturing SMEs and SMEs in the service sector.

Wales [47] also believes that many heterogeneous samples have been investigated in research to date. While these provide positive insights, studies in specific contexts can provide even more accurate information on the relationship between EO and different variables [47]. It can be assumed that the proclivity for open innovation differs in various industries. Therefore investigation should be made in a homogeneous sample from one industry.

Proposition 6: The proclivity for open innovation is different in various industries.

Technological turbulences are defined as rapid technological changes within an industry. Based on their results, Ju et al. [19] assume that SMEs in an industry with technological turbulences are concentrating more on the outside-in process to improve their own innovations. A high EO does not lead SMEs to establish the coupled process in technologically turbulent environments [19].

External factors like existing network structures, legal framework conditions and the environment could affect the opening of the innovation process [48]. It has already been confirmed empirically that external factors influence the effect of EO on company performances [39]. A corresponding effect for the relationship between EO and proclivity for open innovation can be proposed.

Proposition 7: Technological turbulences and external factors moderate the relationship between the EO and the proclivity for open innovation.

The organization’s age and size can lead to different internal and external frame conditions [39].

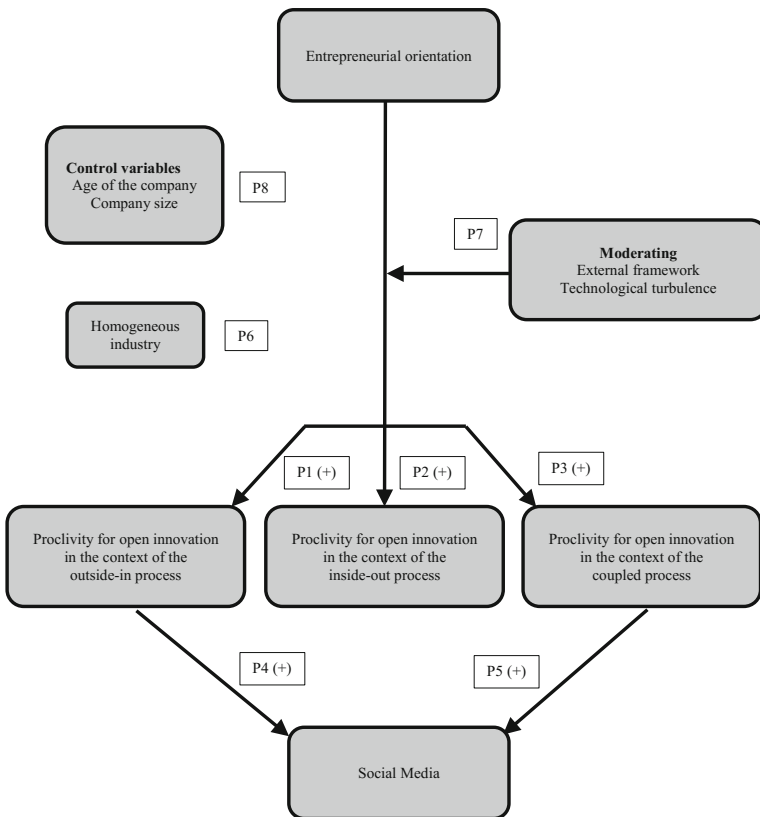


Fig. 1. Theoretical concept to the effect of EO on proclivity for open innovation and its tool social media

In order to implement open innovation, the corporate culture has to be open for innovation. This means that the culture provides the framework for the creation of innovations, while the employees can be creative, necessary spaces exist and something new would be regarded as something positive [2]. The cultural change is necessary, as otherwise the Not-Invented-Here (NIH)-syndrome may occur [10]. This is seen as the greatest barrier in the implementation of open innovation [24]. The syndrome occurs less often in young companies or in rapidly changing industries. Rather, it arises in older established companies with previously closed structures [5]. Therefore, it can be proposed that the company's age has an influence on the proclivity for open innovation.

Due to the company's size the existing financial and personal resources differ. SMEs have lower human and financial resources in comparison to large companies [3]. Because of these limited resources SMEs may not have the necessary multidisciplinary competencies in-house for the development of innovations [4]. Therefore it can be proposed that the company's size and age has an influence on the proclivity for open innovation.

Proposition 8: The relationship between EO and proclivity for open innovation should be controlled for the organization's size and age.

From the theoretical derivation, it can be assumed that EO has a positive effect on the proclivity for open innovation. However, differences can arise depending on internal and external frame conditions as shown in Fig. 1.

All propositions of this paper are shown in Fig. 1.

4 Conclusion

Initial studies have verified the positive effect of EO on the proclivity for open innovation. In one of these studies, this effect was also examined in three main processes [19, 20]. In the studies to date, no distinction was made between different industries [19, 20]. The internal as well as the external framework conditions can be differentiated in various industries, whereby the effect of EO on the proclivity for open innovation can be influenced [35, 39]. Also the moderating effects have to be considered.

In this paper a theoretical concept was developed. The propositions show that appropriateness to implement open innovation depends on the industry sector. Not every industry is suitable, for example the military. When the organization as well as the industry sector fits, a corresponding EO could influence the proclivity for open innovation. Thus, the management's attitude is a key factor for the implementation of open innovation. With proclivity for open innovation the company could be more inclined to implement social media as a tool. This could be a reason for the lower application of social media in German speaking companies.

The theoretical framework created, has not been empirically tested. Therefore, future research could test the theoretical concept and examine the impact of EO on the proclivity for open innovation and its tools within an industry. This also includes a further possibility to investigate the difference between large companies and SMEs. Since not all organizations implement all main processes of open innovation, future

researches should also consider the impact on the individual processes. An interesting study would also be a comparison between different countries as well as between large companies and SMEs.

References

1. Pleschak, F., Sabisch, H.: Innovationsmanagement (in German). Schäffer-Poeschel Verlag, Stuttgart (1996)
2. Vahs, D., Brem, A.: Innovationsmanagement. Von der Idee zur erfolgreichen Vermarktung (in German), 4th revised and expanded edn. Schäffer-Poeschel Verlag, Stuttgart (2013)
3. Vanhaverbeke, W., Vermeersch, I., Zutter, S.: Open innovation in SMEs: how can small companies and start-ups benefit from open innovation strategies? Research report, Flanders DC study (2012)
4. Bianchi, M., Campodall'Orto, S., Frattini, F., Vercesi, P.: Enabling open innovation in small- and medium-sized enterprises: how to find alternative applications for your technologies. *R&D Manag.* **40**(4), 414–431 (2010)
5. Chesbrough, H.: Open innovation: a new paradigm for understanding industrial innovation. In: Chesbrough, H., Vanhaverbeke, W., West, J. (eds.) *Open Innovation: Researching a New Paradigm*, pp. 1–12. Oxford University Press, New York (2006)
6. Antikainen, M.J., Väättäjä, H.K.: Rewarding in open innovation communities – how to motivate members. *Int. J. Entrep. Innov. Manag.* **11**(4), 440–456 (2010)
7. Grabs, A., Bannour, K.M., Vogl, E.: Follow Me! Erfolgreiches Social Media Marketing mit Facebook, Twitter und Co. (in German), 3rd revised edn. Rheinwerk Verlag, Bonn (2015)
8. Hilker, C.: Erfolgreiche Social-Media-Strategien für die Zukunft. Mehr Profit durch Facebook, Twitter, Xing und Co. (in German). Linde Verlag Wien Ges.m.b.H., Wien (2012)
9. Rekece, R., Zimmermann, H.-D., Meili, C.: White Paper: Open Innovation Monitor 2012. Status Quo, Trends und Zukunftsperspektiven (in German). Die Innovationsgesellschaft mbH, St. Gallen (CH) (2012)
10. Reichwald, R., Piller, F.: Interaktive Wertschöpfung: Open Innovation, Individualisierung und neue Formen der Arbeitsteilung (in German), 2nd revised and expanded edn. Gabler GWV Fachverlage GmbH, Wiesbaden (2009)
11. Piller, F.T., Reichwald, R.: Wertschöpfungsprinzipien von Open Innovation. Information und Kommunikation in verteilten offenen Netzwerken (in German). In: Zerfaß, A., Möslein, K.M. (eds.) *Kommunikation als Erfolgsfaktor im Innovationsmanagement: Strategien im Zeitalter der Open Innovation* (in German), 1st edn, pp. 105–120. Gabler GWV Fachverlage GmbH, Wiesbaden (2009)
12. Mount, M., Martinez, M.G.: Social media: a tool for open innovation. *Calif. Manag. Rev.* **56**(4), 124–143 (2014)
13. Vanhaverbeke, W., van de Vrande, V., Chesbrough, H.: Understanding the advantages of open innovation practices in corporate venturing in terms of real options. *Creat. Innov. Manag.* **17**(4), 251–258 (2008)
14. Ili, S., Albers, A.: Chancen und Risiken von Open Innovation (in German). In: Ili, S. (ed.) *Open Innovation. Prozesse, Methoden, Systeme, Kultur* (in German), pp. 43–60. Symposium Publishing GmbH, Düsseldorf (2010)
15. Elenkov, D.S., Manev, I.M.: Top management leadership and influence on innovation: the role of sociocultural context. *J. Manag.* **31**(3), 381–402 (2005)

16. Burcharth, A.L., Knudsen, M.P., Søndergaard, H.A.: Neither invented nor shared here: the impact and management of attitudes for the adoption of open innovation practices. *Technovation* **34**, 149–161 (2014)
17. Rangus, K.: Proclivity for open innovation: construct development, determinants and outcomes. Doctoral dissertation, Ljubljana (2014)
18. Deegahawature, M.: Managers' inclination towards open innovation: effect of job characteristics. *Eur. J. Bus. Manag.* **6**(1), 8–16 (2014)
19. Ju, P.-H., Chen, D.-N., Yu, Y.-C., Wei, H.-L.: Relationships among open innovation processes, entrepreneurial orientation, and organizational performance of SMEs: the moderating role of technological turbulence. In: Kobyliński, A., Sobczak, A. (eds.) *BIR 2013. LNBIP*, vol. 158, pp. 140–160. Springer, Heidelberg (2013). doi:[10.1007/978-3-642-40823-6_12](https://doi.org/10.1007/978-3-642-40823-6_12)
20. Hung, K.P., Chiang, Y.H.: Open innovation proclivity, entrepreneurial orientation, and perceived firm performance. *Int. J. Technol. Manag.* **52**(3/4), 257–274 (2010)
21. Covin, J.G., Slevin, D.P.: The influence of organization structure on the utility of an entrepreneurial top management style. *J. Manag. Stud.* **25**(13), 217–234 (1988)
22. Miller, D.: The correlates of entrepreneurship in three types of firms. *Manag. Sci.* **28**(7), 770–791 (1983)
23. Lumpkin, G., Cogliser, C.C., Schneider, D.R.: Understanding and measuring autonomy: an entrepreneurial orientation perspective. *Entrep. Theory Pract.* **33**(1), 47–69 (2009)
24. Gassmann, O., Enkel, E.: Open Innovation. Die Öffnung des Innovationsprozesses erhöht das Innovationspotenzial (in German). *Z. Führ. Organ.* **75**(3), 132–138 (2006)
25. Chesbrough, H.W.: *Open Innovation. The New Imperative for Creating and Profiting from Technology*. Harvard Business School Publishing Corporation, Boston (2003)
26. Piller, F., Vossen, A., Ihl, C.: From social media to social product development: the impact of social media on co-creation of innovation. *Die Unternehm.* **66**(1), 7–27 (2012)
27. Reichwald, R., Meyer, A., Engelmann, M., Walcher, D.: *Der Kunde als Innovationspartner. Konsumenten integrieren, Flop-Raten reduzieren, Angebote verbessern* (in German), 1st edn. Betriebswirtschaftlicher Verlag Dr. Th. Gabler GWV Fachverlage GmbH, Wiesbaden (2007)
28. da Mota Pedrosa, A., Välling, M., Boyd, B.: Knowledge related activities in open innovation: managers' characteristics and practices. *Int. J. Technol. Manag.* **61**(3/4), 254–273 (2013)
29. Rangus, K., Drnovšek, M., Di Minin, A.: Proclivity for open innovation: construct development and empirical validation. *Innov. Manag. Policy Pract.* **18**(2), 191–211 (2016)
30. Chesbrough, H., Crowther, A.K.: Beyond high tech: early adopters of open innovation in other industries. *R&D Manag.* **36**(3), 229–236 (2006)
31. Yadav, M.S., Prabhu, J.C., Chandy, R.K.: Managing the future: CEO attention and innovation outcomes. *J. Mark.* **71**, 84–101 (2007)
32. Saguy, S.I.: Academia-industry innovation interaction: paradigm shifts and avenues for the future. *Procedia Food Sci.* **1**, 1875–1882 (2011)
33. Lumpkin, G., Dess, G.G.: Clarifying the entrepreneurial orientation construct and linking it to performance. *Acad. Manag. Rev.* **21**(1), 135–172 (1996)
34. Yang, H., Dess, G.G.: Where do entrepreneurial orientations come from? An investigation on their social origin. *Entrep. Firm Emerg. Growth* **10**, 223–247 (2007)
35. Rauch, A., Wiklund, J., Lumpkin, G., Frese, M.: Entrepreneurial orientation and business performance: an assessment of past research and suggestions for the future. *Entrep. Theory Pract.* **33**(3), 761–787 (2009)
36. Covin, J.G., Wales, W.J.: The measurement of entrepreneurial orientation. *Entrep. Theory Pract.* **36**(4), 677–702 (2012)

37. Covin, J.G., Slevin, D.P.: The development and testing of an organizational-level entrepreneurship scale. In: Ronstadt, R., Hornaday, J.A., Peterson, R., Vesper, K.H. (eds.) *Proceedings of the Sixth Annual Babson College Entrepreneurship Research Conference on Frontiers of Entrepreneurship Research 1986*, pp. 628–639. P&R Publications, Waltham (1986)
38. Wiklund, J., Shepherd, D.: Knowledge-based resources, entrepreneurial orientation, and the performance of small and medium-sized businesses. *Strateg. Manag. J.* **24**, 1307–1314 (2003)
39. Wiklund, J., Shepherd, D.: Entrepreneurial orientation and small business performance: a configurational approach. *J. Bus. Ventur.* **20**, 71–91 (2005)
40. Covin, J.G., Slevin, D.P.: A conceptual model of entrepreneurship as firm behavior. *Entrep. Theory Pract.* **16**(1), 7–25 (1991)
41. Damanpour, F., Schneider, M.: Characteristics of innovation and innovation adoption in public organizations: assessing the role of managers. *J. Public Adm. Res. Theory* **19**(3), 495–522 (2008)
42. Elmquist, M., Fredberg, T., Ollila, S.: Exploring the field of open innovation. *Eur. J. Innov. Manag.* **12**(3), 326–345 (2009)
43. van de Vrande, V., Jong, J.P., Vanhaverbeke, W., Rochemont, M.: Open innovation in SMEs: trends, motives and management challenges. *Technovation* **29**, 423–437 (2009)
44. Vora, D., Vora, J., Polley, D.: Applying entrepreneurial orientation to a medium sized firm. *Int. J. Entrep. Behav. Res.* **18**(3), 352–379 (2012)
45. Enkel, E., Gassmann, O.: Neue Ideenquellen erschließen – Die Chancen von Open Innovation (in German). *Mark. Rev. St. Gallen* **26**(2), 6–11 (2009)
46. Enkel, E.: Chancen und Risiken von Open Innovation (in German). In: Zerfaß, A., Möslin, K.M. (eds.) *Kommunikation als Erfolgsfaktor im Innovationsmanagement: Strategien im Zeitalter der Open Innovation* (in German), 1st edn, pp. 177–192. Gabler GWV Fachverlage GmbH, Wiesbaden (2009)
47. Wales, W.J.: Entrepreneurial orientation: a review and synthesis of promising research directions. *Int. Small Bus. J.* **34**(1), 1–15 (2016)
48. Torkkeli, M.T., Kock, C.J., Salmi, P.A.: The “open innovation” paradigm: a contingency perspective. *J. Ind. Eng. Manag.* **2**(1), 176–207 (2009)