

This is the pre-print the article published in the **International Journal of Intellectual Property Management**. The final authenticated version is available online at:

Odrizola-Fernández, I.; Berbegal-Mirabent, J. (2020). The effect of open innovation strategies on business models. A multiple case study in the automotive sector. *International Journal of Intellectual Property Management*, 10(2): 180-198. <https://dx.doi.org/10.1504/IJIPM.2020.108084>

---

## **The effect of open innovation strategies on business models.**

### **A multiple case study in the automotive sector**

Open innovation allows information to be obtained by a company from outside in, and vice versa, in order to achieve improved relationships and better innovation performance in all parties involved in the business environment. This study explores how the adoption of an open innovation strategy changes the business model, specifically, in the case of small and medium enterprises (SMEs). Previous studies have mainly addressed this topic theoretically, and the original contribution of the approach in the present study stems from providing evidence from real cases. A multiple case study examines four cases in the automotive sector. A number of open innovation strategies are analysed, paying special attention to how they have shaped the company's business model and, ultimately, their impact on company performance. The overarching conclusion is that the implementation of open innovation strategies helps companies to focus on its strengths and boosts them. This leads to a redefinition of the business model, so that they are better adapted not only to the essence of the companies but also to the demands of the market.

Keywords: open innovation, business models, SMEs, case study

### **1. Introduction**

In recent decades, companies and markets have evolved considerably because of their ability to organise and transfer knowledge, regarding it as a competitive advantage (Van Wijk et al., 2008). Distribution channels, customer behaviour, supplier reliability, and the disruption of new technologies are altering the traditional way in which companies operate. This argument holds particularly true for small and medium enterprises (SMEs) which typically seek collaboration and cooperation with other companies in order to remain innovative and sustainable in the long term (Argote and Ingram, 2000; Díaz-Díaz and de Saá, 2014). The importance of open innovation in

SMEs is based on sharing the information and tools placed at the service of innovation, in order to create either synergies or new processes and products. SMEs have limited resources that need to be supplemented with collaboration between companies and economic agents in order to innovate and offer a value proposition to the client.

Despite acknowledging the importance and weight of SMEs in today's society, there are, however, few studies on open innovation and the way it affects business models (Laursen and Salter, 2006). The rationale behind the use of open business models is to “open” the business for the purpose of joining forces in all aspects. Some critical voices, however, refuse to see the advantage in cooperation between SMEs. These articles claim that knowledge and information sharing between companies can be a risk if they have different objectives, which is why they would fail in their cooperation (Lichtenthaler, 2008; Almirall and Casadesus-Masanell, 2010).

The objective of this paper is to study the impact that the implementation of open innovation strategies has on a company's business model, and consequently, on its performance. This study contributes to the existing literature in two main ways. First, the traditional limitation of current studies is overcome. Such studies conceptualise the adoption of open innovation strategies but do not use real examples to test their applicability. In this sense, a multiple case study was conducted on four companies that, due to the economic crisis, were struggling to survive because of redundancies, outstanding bills and promissory notes, and delays in payments between companies. Once these companies implemented open innovation practices, they were able to adjust their business models and to survive. The reference framework in this study is that used by Saebi and Foss (2015) who distinguished four means which companies might use to introduce open innovation strategies: market-based, crowd-based, collaborative and network-based. These four strategies rely on the identification of partners and company key resources that foster the company's value proposition, either through a main partner or several collaborators, thus obtaining information from outside the company or boosting intellectual property. Second, how the implementation of these four open innovation strategies changed the business model and their final impact on company performance was also examined. The business model canvas defined by Osterwalder and Pigneur (2010) was used, examining which of the nine building blocks were modified.

The context of the study is the automotive industry in Spain. This sector was chosen because of its importance and influence in the Spanish economy, for four fundamental reasons. First, Spain is the second largest vehicle manufacturer in Europe, and the first in industrial vehicles. Second, this sector generates a high degree of employability, both directly and indirectly. Third, the automotive sector contributes approximately 10% of GDP to the Spanish economy. Finally, manufacturers continue to invest in innovation in order to manufacture more efficient vehicles that use cleaner energy and autonomous driving (driverless cars).

This study is aligned with the recent work of Chesbrough (2017) and Steen and Vanhaverbeke (2018, Chapter 14). Chesbrough (2017) points out the importance of promoting open innovation to transform business models. New opportunities can be found through knowledge sharing, and new business models can consequently be drawn. Steen and Vanhaverbeke (2018) carried out a theoretical study and developed a tool for SMEs that combines open innovation and the business model canvas. Although the approach is valid, this tool is based on static models, whereas open innovation is characterised by using dynamic strategies, and consequently the model is too rigid. In this respect, we posit that new research needs to be conducted that allows for the creation of flexible models.

Innovation is not only one of the main ways for companies to remain competitive in markets but it also helps society to progress. Researching which processes and factors obtain the best possible return with minimum resources is of special interest, and that is why this research is interesting for both professionals and academics. From an academic point of view, this work combines two different bodies of literature, one related to open innovation and one to business models. The case studies allow us to go one step beyond theory and analyse the effect of these models on real companies. On a practical level, the study provides recommendations about how SMEs can improve their performance. Specifically, similarly sized companies in the automotive sector are found to use open innovation strategies when facing difficulties in the market. By doing so they have obtained a higher turnover or client portfolio, reduced unnecessary costs, expanded to more profitable areas and interacted with strategic partners, not only in order to survive but also as a way to improve their position in the market. We believe the cases described can serve as a guide for companies in the same or similar sectors.

The rest of this paper is organised as follows: Section 2 discusses the theoretical foundations that support the work, next, Section 3 describes the research design, results are reported in Section 4 and the paper ends with the discussion and concluding remarks (Section 5).

## **2. Theoretical underpinnings**

### ***2.1. The need to innovate in the business model***

Business models began to expand in the 1990s and promised a great revolution in the business system (especially in internet companies). The etymology of this term clearly reveals its meaning. The word 'model' comes from the Latin word *modello* from the Italian Renaissance in the 16th century, and 'business' comes from the Latin *negotium*, a word formed by 'nec' and 'otium', meaning 'what is not leisure'. Initially, the combination of both words was primarily used to describe a tool that helped low-performing companies to identify their strengths and design a corrective strategy (Magretta, 2002). The business model is currently widely used in both academia and practice, and it is increasingly gaining importance as a business and management concept (Jonshon et al., 2008; Baden-Fuller and Haefliger, 2013).

As defined by Osterwalder et al. (2005: 17-18), a business model can be understood as *'a conceptual tool that contains a set of elements and their relationships and allows expressing the business logic of a specific company. It is a description of the value a company offers to one or several segments of customers and of the architecture of the company and its network of partners for creating, marketing, and delivering this value and relationship capital, to generate profitable and sustainable revenue streams'*. It is worth noting, however, that there is no generally accepted definition of a business model (Wirtz et al., 2016). In this respect, Da Silva et al. (2014) make an interesting critical comment about the inappropriate use of the term 'business model', which has often been confused with terms such as 'strategic plan', 'resource generation', 'economic model' or 'process model'. Magretta (2002) also distinguishes between business models and strategy and adds another variable with which to define the performance of a company: competitiveness. Wirtz et al. (2016) point out that the definition of a business model is usually standardised in several disciplines to help academics and practitioners avoid misinterpretation and vagueness of the definition. The overreaching conclusion is

that, regardless of the fact that some authors disagree over the definition, there is a widespread consensus on its usefulness in order to outline where a company stands, where it should head and how it should get to that desired stage (Amit and Zott, 2012; Foss and Saebi, 2017). It is therefore not surprising that companies, instead of exclusively investing time and money in a new product or process, also invest in business model design (Amit and Zott, 2012).

For a business model to last over time, it must adopt correction strategies, acknowledge the limitations of the company and generate value so as to face the turbulence of the market (Teece et al., 2010; Achtenhagen et al., 2013). According to Chesbrough (2010), experimentation in business models – meaning exploring opportunities and barriers – is of paramount importance in order to remain competitive in the marketplace and consolidate results. In other words, business models do not improve or worsen, but they evolve and are in constant movement. The mission of a company is not only to detect opportunities in the market, but also to generate value through permanent innovation, which should be perceived by both consumers and their environment. A business model is easy to adopt from the point of view of a researcher, however, but not from that of a practitioner. SME managers have little time to adopt these measures, because they focus more on sales, and they do not have a global vision as technological, human and financial resources prevent them from thoroughly monitoring the activities carried out in these areas (Owens, 2007). Business models therefore need to be more open and flexible to allow companies to successfully compete in the market.

The business model canvas began to spread in 2010 when Osterwalder and Pigneur created the nine building blocks that are currently studied in business schools and universities, in one of the most commonly cited books by academics (Osterwalder and Pigneur, 2010). This model has become a simple diagnosis tool for companies and entrepreneurs when analysing company strengths and weaknesses, competence, distribution channels, and how they relate to stakeholders. The resulting picture shows how a company creates value for customers.

The business model canvas is divided into three main parts. The left involves performance, both internal (production and strategic partners) and external (costs), while the right side focuses on income (e.g., sales and distribution channels). Generally,

the blocks covering income and the expenses structure are analysed empirically. In contrast, the other blocks involve impressions, management decisions or perceptions, from a psychological point of view. The value proposition is found at the centre, and is the core offering of the company. These three main parts are, in turn, subdivided, creating the nine building blocks with which the canvas is structured. Figure 1 shows the canvas and Table 1 provides a short description of each block.

Insert Figure 1 about here

Insert Table 1 about here

## ***2.2. Towards open business models***

SMEs have limited resources to implement new processes and products as they tend to lack financial, human resources and technological expertise (Vrgovic et al., 2012). They only have their own resources with which to face the market, and do not always have the best ideas for development into a value proposition on the market (Schneider and Spieth, 2013). Open innovation is therefore presented as a possibility for business models in SMEs. This was suggested in Chesbrough (2006) Chapter 1 'Why business models need to open up?' He noted that in order to remain competitive and save costs, many companies chose to move to India or China. While this strategy might be profitable in the short term, if a company does not innovate, it will not be sustainable in the long term. Using only a short-term strategy is not enough. Companies can take a different approach, accelerating innovation by fostering collaboration not only between departments, but also with key strategic partners outside the company pertaining to the supply chain. Instead of working alone, they started working together more closely, looking for win-win relationships.

Open innovation strategies in SMEs might fail if the strategy is not coherent with the business model (West and Gallagher 2006). Following Saebi and Foss (2015), it is certainly important to ensure the correct association between open innovation strategies and business models, and these authors created a framework containing four main innovation strategies, dependent on the structure of the company and its capacity for

absorbing external information. The four strategies (market-based, crowd-based, collaborative and network-based) are divided into four quartiles, representing the degree of depth and scope in the search for knowledge. A market-based strategy is oriented towards the selection of a specific and homogeneous supplier or partner (quality), while a crowd-based strategy supports the selection of many and heterogeneous partners (quantity). In a collaborative innovation strategy, collaboration is closer and several external agents intervene, such as universities, governments, companies and partners. Finally, the network-based innovation strategy involves an innovation platform where customers, suppliers and companies interact in a common framework to develop a project together.

Steen and Vanhaverbeke (2018) went a step further and proposed the 'Open innovation canvas', which combines the principles of open innovation and the business model canvas. This approach, however, clashes with the essence of open innovation activities. An open innovation canvas involves an internal analysis of the company and does not consider other companies and stakeholders as part of the company. In other words, open innovation involves many agents providing new market opportunities, using and making the partners' resources available in order to innovate, exploit intellectual property, and so on. Another difference lies in the business model, where the emphasis is on the value proposition (Osterwalder et al., 2014). The business model canvas is more static and does not reflect the dynamism of open innovation. The idea of creating an open business canvas is interesting, but a clearly open approach must be taken into consideration in order to combine the two ideas. As this study is based on open innovation strategies, its results are different to those of previous studies and are demonstrated through their impact on some of the nine blocks of the business model canvas, with a special focus on value proposition.

Van der Meer (2007) studied Dutch companies, and concluded that they apply the principles of open innovation depending on the culture and organizational structure of SMEs, which shapes the resulting business model. Lee et al. (2010) stressed the relevance of business models in open innovation by SMEs, in both the exploration (R&D) and exploitation phase (commercialisation). This study is useful because it is based on concepts such as strategic alliance, collaboration, cooperation and networking, elements that are necessary for open innovation to emerge amid all parties involved in the innovation process, and that can affect the company's business model.

### **3. Research design**

#### ***3.1. Research approach***

This paper focuses on the role of SMEs in the implementation of open innovation strategies in business models, as a way of sustaining and encouraging innovation and company survival. This study explores this process using a qualitative approach, which is considered as the most suitable for topics related to innovation activities and business models (Rajala et al., 2012; Frankenberger et al., 2014; Alves Aranha et al., 2015). This paper is based on the theoretical framework developed by Saebi and Foss (2015) and it proposes a multiple case study in the automotive sector. Many studies confirm the utility of qualitative analysis to study innovative processes (Nord and Tucker, 1987; Nutt, 1986; Schnabl, 1995; Repenning and Sterman, 2002; Klein and Knight, 2005; Wiles et al., 2011).

#### ***3.2. Background***

At the background of this study are SMEs in the Spanish region of the Valencian Community, composed of the provinces of Castellón, Valencia and Alicante. According to the National Institute of Statistics (INE; <https://www.ine.es>), there were 164,638 SMEs in 2018. The sector share of GDP takes into consideration all the other sectors related to the automotive industry (distribution, insurance, finance, etc.), the total contribution to GDP being around 10% in 2017 (the Spanish Association of Manufacturers of Automobiles and Trucks, ANFAC).

The automotive industry involves more than 100,000 million euros in Spain, and Spain is not only the country with the second highest production of motor vehicles, but also manufacturers the most industrial cars in Europe ([www.sernauto.es](http://www.sernauto.es)), and the eighth most worldwide. Another important point is that Spain has 1,000 companies that manufacture equipment and components for the automotive sector. According to the ANFAC report in 2017, there are 17 factories in Spain that manufacture motor vehicles, totalling an annual production of 2,819,565 units in 2018, of which 2,215,599 units are passenger cars/sedans and 603,966 are industrial vehicles, with 84.44% being exported. The main manufacturers are Volkswagen, Citroen, Ford, Iveco, Mercedes, Seat and Renault. The Ford factory in Almussafes, Valencia, is a focus in the region, as many SMEs in the area work directly or indirectly for this company. Specifically, 15% of companies that supply components to Ford or other automotive industries are



concentrated in Valencia, 10%-15% in Castellón and only 5% in Alicante (ANFAC).

### **3.3. Facts**

Data was collected from October 2018 to January 2019 through interviews. The interviews were semi-structured and aimed at examining the way the companies implemented open innovation strategies, and their impact on the business model and, ultimately, on company performance. A total of 15 interviews were conducted in four companies. Respondents had managerial profiles (CEO, CFO, sales manager, project manager and operators depending on the size of the company) and were knowledgeable about the strategy of the company. The topics discussed during the interviews were related to the origin of the company, how the company manages its strategies to achieve its annual objectives and the strategic plan for the next three years (in order to see the company's positioning forecast in the medium term). Information was triangulated with in-site visits, the company webpages, annual reports and other material available online. Finally, additional data was also obtained from [www.informa.es](http://www.informa.es). This platform provides commercial, financial, sectoral and marketing information about companies and entrepreneurs, and analyses their recent balance sheets and income statements.

Table 2 shows the main characteristics of the companies studied. The names of the companies have been changed to guarantee anonymity. The data below allows a comparison between companies in the same sector based on their year of creation, activity, size (employees and turnover), gross benefits (before interest, taxes, amortization and depreciation), net profit, management of cash flow and returns. Although other ratios could be considered, the rationale behind those shown is that they have been widely used to evaluate the financial health of companies.

Insert Table 2 about here

Insert Table 3 about here

According to Tables 2 and 3, there are differences in the 10-year comparison (2007-2017). Turnover in Nezbanur's – first recovering and then stable at levels similar to those in 2007 – and especially Vesihk, has improved considerably, as both companies have increased their operating results and EBITDA. The turnovers of Trondis and RLC

have fallen drastically. The profit and ratios of Trondis have decreased, however it should be noted that its profitability is greater in terms of turnover, and that cash flow has also improved. RLC has adjusted its turnover level, but both its EBITDA and turnover profit have improved considerably. Financial and economic profitability ratios do not seem to have improved much. The analysis of the companies in 2017 suggests that they are in good financial health and have positive EBITDAs, which means that the businesses are running properly. The average payment periods of the four companies exceed those of the average collection. In other words, they maintain adequate management of their capital, except in the case of Trondis, which shows a difference of 44 days – probably due to the type of business that the company runs, in which case adjustments are made via bank financing or contributions from partners. Finally, it should be noted that Nezbanur, Vesvihk and Trondis show a positive financial leverage, not verified in the case of RLC though. Maintaining negative leverage means that the average cost of debt is lower than the economic cost, which could only be compensated for by selling products or services at higher prices – creating greater profit margins or managing company assets more efficiently. The return on assets (ROA) in Vesvihk and RLC is positive, over 5% in both cases.

#### **4. Results**

This section illustrates the different categories of open innovation strategies suggested in the Saebi and Foss' (2015) framework. Each category is exemplified by a case study which demonstrates the experience of the company in the automotive sector in the Spanish region of Valencia. This part also explains each company's origin, any problems they faced, how open innovation was introduced and its impact on the business model. The last part connects this to the nine building blocks as defined in Osterwalder and Pigneur's (2010) business model canvas.

##### ***Designing a business model for market-based innovation strategy***

###### *Origins*

Nezbanur is a family business created in 1992 in Valencia that sells Opel vehicles in Spain as an official dealer. The company has a second line of business in purchasing and selling used vehicles.

### *Challenge*

The company employed 15 workers in 2007, but had to dismiss half of them to curb fixed expenses (mainly salaries). Sales dropped year after year from 1,500,000 euros in 2007, to 850,000 euros in 2009 as a result of the economic downturn and clients taking longer to buy a car. The company then focused their efforts on the main office workshop. The few savings they had left were used to reform their facilities, streamlining the workshop to make it more efficient. The workshop was old and lacked proper logistics for the reception of vehicles due to a lack of adequate facilities, which is why vehicle repairs could not be done at the lowest cost and in the shortest time possible. The company knew that the official repairer would increase their charges for spare parts and repairs. Customers took longer to change their vehicle and had their cars fixed more often, which led to the Opel brand becoming an official repairer. Another source of income was selling multi-brand second-hand cars. They also offered a competitive price, and could obtain a good profit margin if the purchase was done correctly.

### *Strategy*

The strategy used by this company is based on choosing a partner and going hand in hand. This allows the company to take advantage of all the latest management and technological innovations and increase customer satisfaction. The company buys the improvements registered by the Opel brand; in other words, it acquires the intellectual property of the head office. This has a double objective: on the one hand, the benefits of standardisation, regulation and automation of the brand processes implemented in the business; and, on the other hand, the intellectual property that applies has an almost guaranteed success rate since it is tested and applied in the company's official workshops in different countries, and is also highly valued by the end customer. In short, given that, in this case, the main partner is a multinational company with economic, human and technological resources available for a minority, SMEs take advantage of this situation by improving competitiveness, becoming leaders in the market and being less prone to turbulence (Hamel and Välikangas, 2003).

### *Impact on the business model*

This open innovation strategy affects the business model canvas, encouraging company revenues in particular, as new sources of income are promoted by investing in the workshop (key activity). All this is supported by the strategic partner that attracts

consumers of the own brand (Opel) and serves as a locomotive strategy for other potential customers (key partnerships). Another aspect that produces a significant impact is frequent contact with the customer. The replacement of parts and regular service produce a more continuous contact with customers by fostering customer loyalty and a customer-centric approach. Nezbatur's value proposition lies in the idea of understanding customers and recognising what they need, and thus income is perceived not only in cars sales but also in subscriptions by offering customers a fee per year which covers all the car parts except the labour employed (revenue streams).

In the figures displayed in Table 2, we can see that although Nezbatur's turnover has decreased by 15% compared to 2007, the operating result has improved by 35%, and the company is more profitable now that 10 years ago. Their average payment periods have improved by seven days and their collection periods by eight days. This is mainly due to the fact that the open innovation strategy they applied has been based on selecting a single partner (OPEL), boosting their own brand workshop and improving sales from the workshop (recurring income) and to a lesser extent from car sales. Another indicator that reveals the success of the strategy is EBITDA, which improved considerably.

### ***Designing the business model for crowd-based innovation strategy***

#### *Origins*

Vesvikh specialises in designing, developing and producing components and services for the automotive industry. Founded in 1998 as a service provider company, it currently has more than 150 employees and a turnover of 20 million euros, and is a highly diversified company in the automotive sector. Their products range from the design and manufacture of metallic structures, and the technical and acoustic insulation of vehicles, to specialisation in the assembly sequence of submodules through the implementation of containment actions and applied engineering.

#### *Issues*

Problems arose during the economic crisis in September 2008. Vesvikh contributed a high percentage to the national turnover with only two lines of business. While this specialisation was successful before the economic downturn, once the stagnation of the markets started, the company was subject to the evolution of the national market characterised by little product diversification. As sales started to decrease, so did

turnover, and the company was forced to downsize. As manufacturers, their structural costs were also too high and constantly endangered the company's viability, without any possibility of making changes in the short term, thus forcing the company to resort to external financial (banks) and dismiss several employees.

### *Strategy*

To overcome this situation, the company started looking for external sources of innovation (research groups, universities, suppliers, customers, competitors) through a chain of information flowing between agents with the aim of innovating within the company. In its beginnings, Vesvihak was a company that acted only as a service provider with a marked business unit. During the crisis, therefore, the company redirected its efforts to three main objectives: to broaden its business lines, to develop new patents that could be sold in other markets/sectors, and to expand its presence abroad with the clear objective of diversifying its sales nationally and internationally. Vesvihak adopted an open innovation strategy so that the information flow from inside out and vice versa all took place in the most profitable areas of the company. An open innovation strategy relies on many parties being involved, which is the key to success. The more stakeholders intervene, the better the innovation achieved. Quantity prevails (the many) over quality (the few), and will lead to more innovation due to the joint forces of communities and platforms in the company.

Vesvihak has grown into one of the most important companies in the sector, with six lines of business (metal frames, technical foams, module assembly and sequencing, applied engineering solutions, logistics services, automotive components design) and exports comprising 20% of its turnover, thus increasing sales in foreign markets every year. This enabled the company to obtain the Q1 quality award in 2016, a certificate awarded by Ford and considered the most prestigious recognition of excellence in quality in the automotive sector.

Vesvihak is currently developing a European project of data processing for decision-making. This project aims, on the one hand, to improve innovation processes through a business intelligence tool and, on the other, to upload all information to the company's cloud, together with other applications that implement the internal and external collaborative information workflow. The objective is to use tools that improve interoperability, and to have functionalities that should enable information sharing or collaborative work. In this project, in order to obtain the maximum amount of

information, the company works together with other stakeholders such as governments, same-sector companies and universities (Project Imdiga/2017/123).

### *Impact on the business model*

The idea of business diversification is at the core of Vesvihk's change. The company opens new markets with strategic stakeholders by developing new products (key partnership). These new products, developed by employees and partners, enable Vesvihk to operate in national and international markets and expand its presence (customer segment). The company's strategy leads to a reduction in operating costs (structural cost) and its value proposition resides in product innovation, as Vesvihk's products are in high demand by customers due to their quality and competitive price. As a result, sales have grown exponentially year after year, to exceed 16 million euros in 2017. This open innovation strategy has been very efficient, and this is perhaps the most remarkable case, as the company has managed to innovate in other sectors, supported by stakeholders who have provided knowledge in order to open new lines of business in new markets. This strategy of open innovation has clearly improved the company's business model, not only from a qualitative point of view – due to reduction of structural costs, target segments, key partners and value proposition recognised by customers – but also from a quantitative one, as corroborated by ROA, ROE, EBITDA and benefit rates.

### *Designing a business model for collaborative innovation strategy*

#### *Origins*

Trondis was created in 1983 and emerged to serve the supply chain of locomotive companies, such as Ford or IBM in the Valencian Community. This company offers supply solutions and the servicing of electronic components, instruments for testing, measurement and analysis, and industrial and consumer computing. They have worked since the beginning with major manufacturers to ensure product quality. Its business lines are electronic and communications instruments, electronic components and computer systems for the industrial automotive sector.

#### *Issues*

Trondis obtained its greatest benefit in 2007, however, in 2009 their orders halved, resulting in 50% of the turnover of the previous year, and incurring losses for the first

time in their history. Suppliers wanted to be paid almost immediately, the quality of their products was unacceptable and, in addition, customers were late in paying, creating an overly lengthy payment period. Financing was insufficient to ensure cash flow. This was a clear case of a solvent company with an enormous lack of liquidity that had to change its strategy in order to face crisis.

### *Strategy*

The success of Trondis lay in working closely with trusted laboratories and suppliers in a collaboration framework so that they could calibrate their equipment properly. The companies all gather optimal environmental and technological characteristics to ensure that calibration processes were carried out in appropriate and traceable conditions (Dodgson et al., 2006). The trust in both collaborating parties allows the company to offer a differentiated service to its customers. Trondis started in the automotive and computer world. Through the R&D department and in collaboration with its strategic partners, the company has been able to diversify its products for other sectors, such as communications, health, teaching and renewable energies, and also to research in other areas. This has built trust between partners and has allowed the company to expand its range of services by offering comprehensive solutions, highly valued by end customers. To obtain these results, Trondis maintains a direct information channel between the collaborating companies, which is why the company responds better and faster to customer orders and solves problems without involving intermediaries. In summary, the cooperation between suppliers and partners allows them to guarantee a quality product due to their similar technological levels.

### *Impact on the business model*

The company transformed its business model through open innovation by carrying out very specific work for its clients. This sort of business in the industrial and medical sector addresses a technical segment which is hard to attain because of the severe entry barriers. Policy makers and customers require high quality and legal standards for their products (key segment). Trondis uses very specific resources (measurement devices) to carry out measurement (key resources). This strategic collaboration with laboratories lead its customers to value the products for measurement reliability and promptness in product delivery. The success of Trondis was based on an open and reliable collaboration. Nevertheless, service quality is not everything, as customers are also willing to pay for delivery time. Having ensured better quality and knowing that the

company was perceived as a quality supplier due to its response time, Trondis negotiated terms of payment to avoid delays, thus balancing cash flow. In addition, the company changed its method of payment. Revenues ensure steady income to a payment modality service operator that performs on-site checks periodically, but also lends their equipment to other companies (key revenues). In consequence, the company's value proposition resides in the quality of its products. Equipment ensures accuracy in the markets in which the company operates, experience, and permanent innovation, while collaboration with suppliers and partners allows the customer to select Trondis as their first option.

Despite having reduced its income by almost 50%, the company has managed to adapt to the market in which it operates, obtaining a return of 8% in 2017, compared to 2% in 2007. The great advantage of Trondis has been its use of an open innovation strategy based on collaboration, which has improved its cash flow up to 44 days (the difference between payments and collections). That is to say, Trondis has managed to considerably improve its rate of collection and payment management, which stood at 117 days in 2007, jeopardising the company's viability. Company ROA stays positive despite its decrease, but ROE increases. The company's business model has been a success, as Trondis is currently solvent and liquid. In 2007, it was solvent but lacked liquidity, which also jeopardised the company's viability.

### ***Designing a business model for a network-based innovation strategy: RLC***

#### *Origin*

RCL is a company founded 40 years ago, which manufactures precision gear and components adaptable to small places, operating in the automotive, vending and electromechanical sectors.

#### *Issues*

During the crisis in 2009, RCL was a company with a significant turnover of 10,000,000 euros and benefits of 200,000 euros. This company's situation has changed in the last decade. RCL invoiced less, until it reached the current turnover of 5,000,000 euros, but maintained the same amount of benefits when earning half of its turnover in 2009 as compared to its peak years, thus becoming much more profitable. This means that RCL selects only the most profitable projects, using half the resources. In other words, the company has adjusted its departments by employing the minimum number of



staff required and by selling non-strategic assets, such as machinery, for cost saving purposes.

### *Strategy*

This company bases its strategy on market diversity. RCL collaborates with a network of partners that belong to different sectors, such as electro-mechanical, vending, automotive, differential and switch gear, air conditioning, security and hospitality. The partners participate in the research and development activities of the company. At present, this company belongs to AVIA, an automotive cluster that is formed of SMEs, multinationals, technological institutes and public administrations. These sort of clusters benefits not only from new ideas or projects, but also foster training, possible alliances, productivity and communication between companies. In addition, AVIA constantly provides contacts and benefits from other projects due to the close collaboration between SMEs.

### *Impact on the business model*

RCL only focuses on the businesses that are most profitable, discarding those with high billing because it does not represent a guarantee of payment collection and risks company profitability (key activities). Being in touch with the innovation clusters, the company receives projects from the automotive sector (key activities). This cluster acts as an open innovation platform where several companies carry out joint projects, contributing the resources of the company (intellectual, human and financial) for the benefit of the project they develop. Each project started by RCL is used to meet new clients, which usually increases the number of clients for new projects (customer relationships). Lastly, the company reduced structural costs such as salaries depending on the turnover and adapting their resources to the needs of the company.

RCL is in a completely different position than it was 10 years ago. The company has decreased its sales by 50% compared to 2007, but its profits have remained practically the same. In other words, the company is much more profitable because it uses fewer resources than a decade ago. This is mainly because the company's strategy is based on maintaining a network that allows access to the most profitable projects. RCL had to move large amounts of money to obtain a profit near 2%. Currently, its margin is 3.2%, EBITDA has improved considerably and the average payment and collection periods have stayed constant. In short, the business model has changed in

terms of the company's relationship with its customers, its value proposition, and the structural costs reduction and selection of key activities to be carried out.

Table 3 summarises the strategies followed by the different companies and the main effects observed in the business model canvas.

Insert Table 3 about here

## **5. Discussion and concluding remarks**

Four companies in the automotive sector were examined in this study. These companies faced difficulties during the economic crisis and followed different strategies of open innovation to survive or to access other markets, thus expanding their possibilities. Analysis of the different cases suggests several implications.

First, this work complements the existing literature by showing that the use of open innovation strategies helps companies to transform their business models, and ultimately offer new value to customers. These strategies are the basis for helping companies to face market turbulence, distinguishing between product distribution companies or intermediaries and product manufacturers. For example, it would be convenient for 'distributor-centric' companies to use two types of strategies in their business models. Intermediary companies should use the business model for collaborative innovation strategy as a tool for product innovation, distribution channels, suppliers and governments backed by them, to reach as many customers as possible. Companies that have the exclusive distribution of a certain manufacturer should use a business model for a market-based innovation strategy because they benefit from the intellectual property developed by the manufacturer. However, manufacturing companies should apply two open innovation strategies. Companies that manufacture a specific product should use the business model for crowd-based innovation strategy with the clear objective that all agents and stakeholders should be part of the process of product innovation and development, from material purchasing to commercialization. Manufacturing companies that develop products in collaboration with other companies should use the model for network-based innovation strategy, because they benefit from receiving information from other companies, helping them to develop not only their

products, through innovation with applicability to other products in their own company, but also new projects that may arise as a result of former successful collaborations.

Second, previous studies (Narula 2004; Rahman et al., 2010; Lasagni 2012; Parida et al., 2012; Suh et al., 2012; Vrgovic et al., 2012; Eppinger et al. 2013; Hochleitner et al., 2017) confirm the effect of inbound strategies, collaboration strategies and IP strategies in the performance of SMEs, but only a few studies show the relevance of engaging stakeholders as an effective strategy to improve company performance. Sometimes suppliers are involved in company innovation (inbound/outbound activities), but sometimes they are not, as in the case of outsourcing, where they do not participate in any process beyond providing the specific service or product. Even if it is not essential, however, SMEs cannot develop their business without the participation of third companies that indirectly intervene in product marketing (for example, in the case of outsourcing logistics to a transport company to take the product to the client). The present study pointed out that stakeholders are important when innovating, and emphasised quantity rather than quality. It is observed, therefore, that, whether directly or indirectly, stakeholders intervene in SME business and consequently, take part in innovation.

Third, it seems that, when turnover decreased and the fourth company was not profitable, the first step it adopted was to reduce costs or selling non-strategic assets and/or dismiss employees. Companies then look at stakeholders, appeal to collaboration/information or IP in order to increase their own business model. These four strategies have been at the base of the transformation of their business and have affected several parts of the blocks in the canvas model, allowing SMEs to both focus on the key segments that earn the most revenue and to exploit their strategic assets in order to offer a product that customers perceive as having more benefits. The four open innovation strategies will depend on business activity, size, and assets, and also on the company's absorptive capacity, degree of collaboration, technology, and intellectual property developed or acquired.

Fourth, companies in the automotive sector have succeeded not only through the control of expenses, but also by looking for other business opportunities through innovation and by being appealing to large multinationals in the Spanish automotive sector. This is because the Spanish minimum salary is not as high as that in France or

Germany, but employees are as highly qualified as in other European countries. Spain is also logistically well situated, with easy access by land, sea and air.

Finally, and importantly, this study has some limitations, which in turn represent opportunities for future studies. The main focus has been on inbound open innovation activities, rather than on outbound ones. Future research should explore open innovation strategies in this other direction. Another limitation involves the approach used. A qualitative analysis was performed, and quantitative studies are necessary to complete this research. In addition, it would be interesting to include other items in the analysis, such as management decisions and the capacity of knowledge absorption. New studies should also be encouraged to broaden the scope of this work and research other sectors and regions.

## References

- Achtenhagen, L., Melin, L. and Naldi, L. (2013) 'Dynamics of business models—strategizing, critical capabilities and activities for sustained value creation', *Long Range Planning*, Vol. 46 No. 6, pp. 427-442.
- Almirall, E. and Casadesus-Masanell, R. (2010) 'Open versus closed innovation: A model of discovery and divergence', *Academy of Management Review*, Vol. 35 No. 1, pp. 27-47.
- Alves Aranha, E., Garcia, P., Abudd, N. and Corrêa, G. (2015) 'Open innovation and business model: a Brazilian company case study', *Journal of Technology Management & Innovation*, Vol. 10 No. 4, pp. 91-98.
- Amit, R. and Zott, C. (2012). 'Creating value through business model innovation', MIT Sloan Management Review, Vol. 53 No. 3, pp. 41-49.
- ANFAC. [online] Asociacion Española de Fabricantes de Automóviles y Camiones <http://www.anfac.es> (Accessed 05 June 2018).
- Argote, L., Ingram, P., Levine, J.M. and Moreland, R. L. (2000) 'Knowledge transfer in organizations: Learning from the experience of others', *Organizational Behavior and Human Decision Processes*, Vol. 82 No. 1, pp. 1-8.
- Baden-Fuller, C. and Haefliger, S. (2013) 'Business models and technological innovation', *Long Range Planning*, Vol. 46 No. 6, pp. 419-426.
- Chesbrough, H. (2010) 'Business model innovation: opportunities and barriers', *Long Range Planning*, Vol. 43 No. 2-3, pp. 354-363.

- Chesbrough, H. (2017) 'The Future of Open Innovation: The future of open innovation is more extensive, more collaborative, and more engaged with a wider variety of participants', *Research-Technology Management*, Vol. 60 No. 1, pp.35-38.
- Chesbrough, H. (2006) *Open innovation: The new imperative for creating and profiting from technology*. Harvard Business University Press, Harvard.
- Díaz-Díaz, N.L. and de Saá Pérez, P. (2014) 'The interaction between external and internal knowledge sources: an open innovation view', *Journal of Knowledge Management*, Vol. 18 No. 2, pp. 430-446.
- Dodgson, M., Gann, D. and Salter, A. (2006) 'The role of technology in the shift towards open innovation: the case of Procter & Gamble', *R&D Management*, Vol. 36 No. 3, pp. 333-346.
- Eppinger, E. and Vladova, G. (2013) 'Intellectual property management practices at small and medium-sized enterprises', *International Journal of Technology Management*, Vol. 61 No. 1, pp. 64-81.
- Foss, N. and Saebi, T. (2018) 'Business models and business model innovation: Between wicked and paradigmatic problems', *Long Range Planning*, Vol. 51 No. 1, pp. 9-21.
- Frankenberger, K., Weiblen, T. and Gassmann, O. (2014) 'The antecedents of open business models: an exploratory study of incumbent firms', *R&D Management*, Vol. 44 No. 2, pp. 173-188.
- Johnson, M.W., Christensen, C.M. and Kagermann, H. (2008) 'Reinventing your business model', *Harvard Business Review*, Vol. 86 No. 12, pp. 57-68.
- Hamel, G. and Valikangas, L. (2003) 'Why resilience matters', *Harvard Business Review*, Vol. 81 No. 9, pp. 56-57.
- Hochleitner, F., Arbussà, A. and Coenders, G. (2017) 'Inbound open innovation in SMEs: Indicators, non-financial outcomes and entry-timing', *Technology Analysis and Strategic Management*, Vol. 29 No. 2, pp. 204-218.
- Klein, K. and Knight, A.P. (2005) 'Innovation implementation: Overcoming the challenge', *Current Directions in Psychological Science*, Vol. 14 No. 5, pp 243-246.
- Lasagni, A. (2012) 'How can external relationships enhance innovation in SMEs? New evidence for Europe', *Journal of Small Business Management*, Vol. 50 No. 2, pp. 310-339.
- Laursen, K. and Salter, A. (2006) 'Open for innovation: the role of openness in explaining innovation performance among UK manufacturing firms', *Strategic*

- Management Journal*, Vol. 27 No. 2, pp. 131-150.
- Lee, S., Park, G., Yoon, B. and Park, J. (2010) 'Open innovation in SMEs—An intermediated network model', *Research Policy*, Vol. 39 No. 2, pp 290-300.
- Magretta, J. (2002) 'Why business models matter', *Harvard Business Review*, 80(5), 86-92.
- Narula R. (2004) 'Understanding absorptive capacity in an 'innovation system context: consequences for economic and employment growth', *MERIT-Infonomics Research Memorandum Series*, 2004-2003, Maastricht.
- INE. [online] National Institute of Statistics <https://www.ine.es> (Accessed 7 October 2018).
- Nord, W. and Tucker, S. (1987) *Implementing routine and radical innovations* Lexington. Lexington Books, Massachusetts.
- Nutt, P. (1986). 'Tactics of implementation', *Academy of Management Journal*, Vol. 29 No. 2, pp. 230-261.
- Osterwalder, A. and Pigneur, Y. (2010) *Business model generation: A handbook for visionaries, game changers, and challengers*. John Wiley & Sons, Hoboken, New Jersey.
- Osterwalder, A., Pigneur, Y. and Tucci, C.L. (2005) 'Clarifying business models: Origins, present, and future of the concept', *Communications of the Association for Information Systems*, Vol. 16 No. 1, pp 1.
- Owens, J. (2007) 'Why do some UK SMEs still find the implementation of a new product development process problematical? An exploratory investigation', *Management Decision*, Vol. 45 No. 2, pp. 235-251.
- Parida, V., Westerberg, M. and Frishammar, J. (2012) 'Inbound open innovation activities in high-tech SMEs: the impact on innovation performance', *Journal of Small Business Management*, Vol. 50 No. 2, pp. 283-309.
- Rahman, H. and Ramos, I. (2010) 'Open Innovation in SMEs: From closed boundaries to networked paradigm', *Issues in Informing Science and Information Technology*, Vol. 7 No. 4, pp. 471-487.
- Rajala, R., Westerlund, M. and Möller, K. (2012) 'Strategic flexibility in open innovation—designing business models for open source software', *European Journal of Marketing*, Vol. 46 No. 10, pp. 1368-1388.
- Repenning, N. and Sterman, J. (2002) 'Capability traps and self-confirming attribution errors in the dynamics of process improvement', *Administrative Science Quarterly*,

- Vol. 47 No. 2, pp. 265-295.
- Saebi, T. and Foss, N. (2015) 'Business models for open innovation: Matching heterogeneous open innovation strategies with business model dimensions', *European Management Journal*, Vol. 33 No. 3, pp 201-213.
- Schnabl, H. (1995) 'The Subsystem—MFA: A Qualitative Method for Analyzing National Innovation Systems—The Case of Germany', *Economic Systems Research*, Vol. 7 No. 4, pp. 383-396.
- Schneider, S. and Spieth, P. (2013) 'Business model innovation: Towards an integrated future research agenda', *International Journal of Innovation Management*, Vol. 17 No. 01, pp 1340001.
- Sernauto. [online] Asociacion Española de Fabricantes y Componentes para Automóviles, Portal de Transparencia <http://www.sernauto.es/> (Accessed 2 September 2018).
- Steen, M. and Vanhaverbeke, W. (2018) 'The open innovation project Canvas for SMEs', in Vanhaverbeke, W., Frattini, F. Roijackers, N. and Usman, M. (Eds.), *Researching Open Innovation in SMEs*, World Scientific Publishing, Singapore, pp.429-454.
- Suh, Y. and Kim, MS. (2012) 'Effects of SME collaboration on R&D in the service sector in open innovation', *Innovation: Management, Policy and Practice*, Vol. 14 No. 3, pp. 349-362
- Teece, D.J. (2010) 'Business models, business strategy and innovation', *Long Range Planning*, Vol. 43 No. 2-3, pp. 172-194.
- Van der Meer, H. (2007) 'Open innovation—the Dutch treat: Challenges in thinking in business models', *Creativity and Innovation Management*, Vol. 16 No. 2, pp. 192-202.
- Van Wijk, R. Jansen, J. and Lyles, M.A. (2008) 'Inter- and intra-organizational knowledge transfer: A meta-analytic review and assessment of its antecedents and consequences', *Journal of Management Studies*, Vol. 45 No. 4, pp 830-853.
- Vrgovic, P., Vidicki, P., Glassman, B., and Walton, A. (2012) 'Open innovation for SMEs in developing countries—An intermediated communication network model for collaboration beyond obstacles', *Innovation*, Vol. 14 No. 3, pp. 290-302.
- West, J. and Gallagher, S. (2006) 'Challenges of open innovation: The paradox of firm investment in open-source software', *R&D Management*, Vol. 36 No. 3, pp. 319-331.
- Wiles, R., Crow, G. and Pain, H. (2011) 'Innovation in qualitative research methods: A

narrative review', *Qualitative Research*, Vol. 11 No. 5, pp. 587-604.

Wirtz, B., Pistoia, A., Ullrich, S. and Göttel, V. (2016) 'Business models: Origin, development and future research perspectives', *Long Range Planning*, Vol. 49 No. 1, pp. 36-54.



## List of Tables

Table 1. Description of the building blocks of the business model canvas (based on Osterwalder and Pigneur, 2010)

<b>Building block</b>	<b>Description</b>
Customer segment	Defines the markets or niches a company pretend to direct their products or if those markets are segmented.
Value propositions	The purpose of the client is to identify interesting the products offered by a firm, whether it is more innovative, a better design, low cost or allows for customize.
Customer channels	Explains how customers reach value proposition of a product or service since they contact for the first time to the after-sales service.
Customer relationships	Represents what type of relationship the company expects to obtain once it has contacted the customer (personalized, self-service or automated services).
Revenue streams	Describes the way through which a company generates incomes once the client wishes to acquire a service or product (traditional sale, payment for use, subscription).
Key resources	Describes the main assets of the company used to develop the business model (physical, intellectual, human or financial).
Key activities	It consists in identifying which are the basic areas of the business so that the value proposition can be articulated (marketing, production, quality, logistics).
Key partnerships	Represents the key agents to develop the business model (optimization of resources, alliances, outsource services, etc.).
Cost structure	It describes all the costs that the company supports as a consequence of developing its activity (fixed or variable costs) and according to its nature.

Table 2. Firms' main descriptives

<b>Characteristics</b>	<b>Nezbanur</b>	<b>Vesvihk</b>	<b>Trondis</b>	<b>RLC</b>
Founding year	1979	1998	1983	1994
Business activity	Car dealership	Automotive components	Distribution	Electromechanical actuators
<b>2017</b>				
Number employees	6	250	18	70
Turnover (€)	1.323.349	16.861.871	3.690.580	5.795.415
Profit (€)	15.278	2.287.300	30.985	185.696
EBITDA	19.276	3.578.506	98.250	895.334
Average payment period*	62	57	74	86
Average benefit period*	27	27	118	39
ROA (%)	0,76	37,35	1,62	7,78
ROE (%)	3,44	60,71	2,67	5,78
<b>2007</b>				
Number employees	4	135	25	94
Turnover (€)	1.552.478	6.217.417	6.634.319	10.808.075
Profit (€)	6.534	44.524	150.696	216.726
EBITDA	11.235	420.667	385.425	625.773
Average payment period*	55	38	32	81
Average benefit period*	35	29	149	47
ROA (%)	0,5	8,82	2,27	14,45
ROE (%)	2,91	5,67	1,23	18,43

Note: ROA = Return on Assets. ROE = Return on Equity.

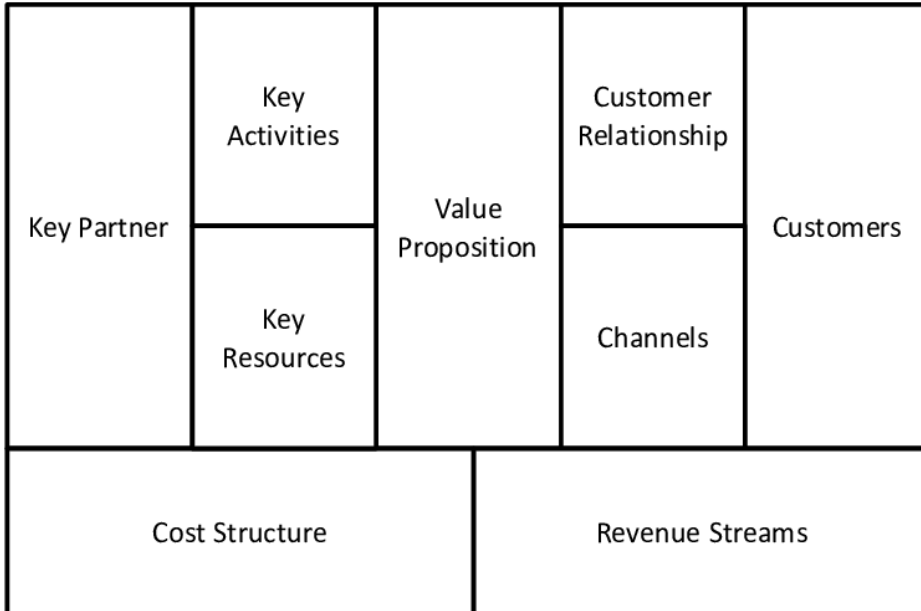
\* Expressed in days.

Table 3. Firms' strategic choices and main impacts

<b>Firms</b>	<b>Open innovation strategy</b>	<b>Main impacts on the business model canvas</b>
<b>Nezbanur</b>	Market-based innovation strategy	Key activities, key partnerships, revenue streams, value proposition
<b>Vesvihk</b>	Crow-based innovation strategy	Key partnerships, customer segments, structural cost, value proposition
<b>Trondis</b>	Collaborative innovation strategy	Key segments, key resources, revenue streams, value proposition
<b>RLC</b>	Network-based innovation strategy	Key activities, customer relationships, structural costs, value proposition

## List of Figures

Figure 1. Business Model Canvas



Source: Adapted from Osterwalder and Pigneur (2010)