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SUSTAINABLE BUSINESS MODELS – WHAT DO MANAGEMENT THEORIES SAY?

Literature describing the notion and practice of business models has grown considerably over the last few years. Innovative business models appear in every sector of the economy challenging traditional ways of creating and capturing value. However, research describing the theoretical foundations of the field is scarce and many questions still remain. This article examines business models promoting various aspects of sustainable development and tests the explanatory power of two theoretical approaches, namely the resource based view of the firm and transaction cost theory regarding their emergence and successful market performance. Through the examples of industrial ecology and the sharing economy the author shows that a sharp reduction of transaction costs (e.g. in the form of internet based systems) coupled with resources widely available but not utilised before may result in fast growing new markets. This research also provides evidence regarding the notion that these two theoretical approaches can complement each other in explaining corporate behaviour.

Keywords: innovative business model, corporate sustainability, industrial ecology, sharing economy, transaction costs, resource based view

Interest in the topic of business models has shown a significant increase over the last few years. Casadesus-Masanell and Zhu point out the importance of the notion in both managerial practice and academic literature as a result of an “increasing number of opportunities for business model configurations enabled by technological progress, new customer preferences, and deregulation” (Casadesus-Masanell – Zhu, 2013, p. 464).

Regarding the practical use of the notion, Amit and Zott cited several surveys conducted among senior managers and came to the conclusion that there are several reasons why business model innovation is more appealing to company management than more traditional product and process innovations: first, new business models represent often underutilized sources of future value; second, the imitation or replication of an entire novel activity system is more difficult than a single product or process; and third, because business model innovation can be a potentially powerful competitive tool (Amit – Zott, 2012).

According to Johnson et al. a new business model can facilitate a novel technology, especially when an entirely new group of customers is addressed. The authors also note the role of new business models when an established company faces a disruptor on the market (Johnson et al., 2008).

Studies demonstrating practical experiences also provide evidence of the growing importance of business models. According to Johnson et al. (2008, p. 10.) “in the USA, 40% of the 27 companies founded over the last 25 years, that grew their way into the Fortune 500 over the past 10 years, did so through business model innovation”. A recent study surveying the ratio of small and medium enterprises (SMEs), which have undertaken business model innovation by country and by sector, provides evidence that in some countries 8-10% of SMEs undertake some form of business model innovation (although in some counties, as in Hungary this may be as low as 1-2%) (Empirica and FHNW, 2014).

Parallel to practical developments, scientific interest has also increased towards emerging business models. A Scopus search for the term “business model” amongst article titles, abstracts and keywords since October, 2015 revealed 3,909 articles in the “Social Sciences and Humanities” subject area. Of these, 2,457 have been published between 2010 and 2015. Looking at the top management journals, Scopus can locate 43 articles up to and including 2009 and 26 articles since 2010. Two scientific journals, namely Strategic Management Journal and Management Science, have each published 12 articles over the whole period related to “business models”, while 45 articles were published in practice-oriented journals, Harvard Business Review leading with 29 articles.

Definitions, components and design of business models

While the literature with regard to business models is growing fast, a widely accepted definition still does not exist.

Business models can be interpreted as “stories that explain how enterprises work” (Magretta, 2002, p. 4.), but several other definitions have been created over the years with different purposes in mind. Morris et al. defines a business model as a “concise representation of how an interrelated set of decision variables in the areas of venture strategy, architecture, and economics are addressed to create sustainable competitive advantage in defined markets” (Morris et al., 2005, p. 727.)

Zott and Amit focus on the embedded nature of any given business organization in an ecosystem of other organizations when defining a business model as a “system of interdependent activities that transcends the focal firm and spans its boundaries” (Zott – Amit, 2010, p. 216.). “A business model is a bundle of specific activities — an activity system — conducted to satisfy the perceived needs of the market, along with the specification of which parties (a company or its partners) conduct which activities, and how these activities are linked to each other” (Amit – Zott, 2012).

Additionally, Casadesus-Masanell and Ricart (2010) argue that a clear distinction between ‘business model’, ‘strategy’ and ‘tactics’ is needed in order to enhance the contribution of scientific literature with regard to the topic. They define a business model as a reflection of a firm’s realized strategy and note that while every business has a business model, i.e. it makes choices that have consequences, not every organization has a strategy (Casadesus-Masanell – Ricart, 2010).

Discussing the characteristics of internet based business models, Moricz (2007) points out that while strategies define the relationships of businesses with their competitive environment, business models take a system perspective by defining the crucial elements of businesses and the match between them.

Concentrating on the elements of business models, Timmers provides the following definition: “an architecture of the product, service and information flows, including a description of the various business actors and their roles; a description of the potential benefits for the various business actors; a description of the sources of revenues” (Timmers, 1998, p. 2.).

Other authors also focus on the different components of business models. Morris et al. (2005) defines these elements as value propositions, customers, internal processes/competencies, external positioning, economic models, and personal/investor factors. Johnson et al. (2008), on the other hand, identifies customer

value propositions, profit formulae, key resources, and key processes as the most important building blocks of business models.

A popular practical guide to creating and assessing new business models by Osterwalder and Pigneur (2010) defines nine building blocks of a business model within their ‘business model canvas’ framework: customer segments, value propositions, channels, customer relationships, revenue streams, key resources, key activities, key partnerships and cost structure.

Practical literature on business modelling places an emphasis on the process of business model generation, as well as the analysis and further development of existing business models.

Osterwalder and Pigneur, for example, identify six different business model design techniques: customer insights, ideation, visual thinking, prototyping, storytelling and scenarios. They also list methods they used to forward their own project of the business model canvas including environmental scanning, customer empathy maps, co-creation, open design processes, etc. (Osterwalder – Pigneur, 2010).

Chesbrough points out the necessity of such processes as experimentation, effectuation (which places an emphasis on taking actions over analysis and using information resulting from these actions) and leading change in organisations (Chesbrough, 2010).

While some of the tools to be used for successful business model innovation seem to be rather simple, several barriers hinder implementation in many organisations. It is generally assumed that small organisations, especially start-ups, are more apt to undertake the processes required to succeed in implementing new models of operation, but many other factors also influence business model innovation.

Chesbrough (2010) argues that a new technological solution, without the appropriate business model, may be less valuable than an inferior solution with a matching business model. He cites the example of Xerox and spin-off companies who have successfully marketed products originally developed by the company. In such cases, when the innovator is not able to design a suitable business model, others who have left the organisation may succeed by experimenting with different business models (Chesbrough, 2010).

Regarding the barriers to business model innovations, the author asks the question why organizations are not experimenting with new solutions before the market renders their traditional business model redundant?

Chesbrough – after analysing the work of Amit and Zott and Christensen – points out the cognitive barriers to business model innovation: “the success of estab-

lished business models strongly influences the information that subsequently gets routed into or filtered out of corporate decision processes” (Chesbrough, 2010, p. 358.). Another issue to tackle is the organizational problem caused by the co-existence between current and new business models (Chesbrough, 2010).

Sustainable business models

Pivotal environmental and social issues call for more radical changes than offered by many current corporate practices, e.g. pollution prevention, environmental management systems, etc. Proponents of sustainable development realised long ago the potential benefits of a number of new, innovative business models, e.g. solutions offered by the sharing economy, industrial symbiosis, product-service systems, social enterprises, etc., but a systematic analysis of their environmental and social performances is still lacking.

Schaltegger et al. assert that the notion of business models can provide a useful framework to analyse disruptive change in business operations from a sustainable development point of view since it illuminates the value creation logic of an organization, its effects and allows for new forms of governance (Schaltegger et al., 2015).

Boons and Lüdeke-Freund (2013) look at business models as market devices, which allow for the unfolding of the assumed sustainability potential of a certain innovation. In this context, business models are successful if they can overcome the barriers posed by institutionalised organizational memory and the external business environment.

After reviewing the literature on business models, they propose some normative requirements that business models should meet in order to support sustainable innovation (Boons – Lüdeke-Freund, 2013):

- the value proposition should provide measurable ecological and/or social value,
- suppliers should take responsibility for their own and their suppliers’ stakeholders,
- customers should be motivated to take responsibility for their consumption and for the stakeholders of the companies involved in the supply chain,
- economic costs and benefits should be distributed appropriately among actors and should account for the company’s ecological and social impacts.

SustainAbility, a think tank and strategic advisory firm identifies a number of different business models with potential benefits to the environment and society and classifies them into five separate groups as follows:

1. Business models with a potential positive impact on the environment:
 - Closed-Loop Production,
 - the replacement of physical infrastructure with virtual services,
 - produce on demand,
 - rematerialization (using waste as raw material, creation of new products).
2. Business models aiming at social innovation:
 - using the profits earned from the sale of a product/service to donate a similar product/service to those in need,
 - cooperative ownership,
 - inclusive sourcing (supporting the suppliers of products and services).
3. Base of the pyramid business models:
 - building new markets in innovative and socially responsible ways,
 - differential pricing (charging more for those who can afford it to subsidize those who cannot),
 - microfinancing to low income borrowers,
 - microfranchising (to help the poor to start their own businesses).
4. Innovative financing models:
 - crowdfunding,
 - offering a free product and charging for premium services (freemium),
 - innovative product financing (leasing or renting instead of buying),
 - employing performance-based contracting,
 - subscription model.
5. Business models with diverse impacts on sustainability:
 - alternative marketplace using a new type of transaction,
 - changing customer behaviour to reduce consumption,
 - product as a service,
 - shared resource/product.

Machiba (2012) explores the economic, social/cultural and environmental benefits of various sustainability-oriented business models. Table 1 shows the direct benefits (first-order value criteria), but the authors also uncover a number of wider, systematic effects, e.g. greener markets, reduced footprints, GHG emission reductions, resource use optimisations and savings, etc.

Table 1

The sustainability benefits of various business models (Machiba, 2012)

Business model types	Core value propositions	First-order value creation		
		Economic	Social/cultural	Environmental
Green value-added products	<i>Products with better performance, savings</i>	Savings and better performance for customers Profit for focal company and its suppliers	Green image	
Waste regeneration systems	<i>Revenue from waste valorisation, alternative products</i>	Revenue from waste valorisation, alternative products	Green image/ bio brand	Minimisation of the impact of waste
Renewable energy-based systems	<i>Cheaper & cleaner energy</i>	Cheaper energy for customers Profit for focal company	Green image	Minimisation of the reliance on fossil fuels
Efficiency optimisation by ICT	<i>Economic savings due to more efficient management of resources</i>	Profit for focal company		
Functional sales	<i>More efficient services</i>	Savings for customers	Convenience	
Innovative financing	<i>Resource savings</i>	Profit for focal company	Convenience	
Sustainable mobility systems	<i>Flexibility, savings for customers</i>	Savings for customers Profit for focal company	Flexibility	
Industrial symbiosis	<i>Resource savings, higher efficiencies</i>	Resource savings	Learning	Waste and emission reductions
Eco-cities	<i>Improved quality of life, convenience</i>	Improved quality of life Green image	Improved environment	

A theoretical perspective on business models

Initial optimism surrounding sustainable business models with regard to their positive impact on environmental and social processes is slowly giving way to a more sophisticated understanding of their potential benefits and drawbacks. This is essential since policy-makers currently lack reliable information regarding their overall, long term impacts on society – as demonstrated, for example, by the ongoing debate about the legal regulations of car-sharing services in several European countries or the market consequences (e.g. on realty prices) of the rapid growth of apartment sharing businesses.

While some practical experience has already been accumulated, little effort has been put into investigating the theoretical underpinnings of such business models. For

this reason, the following section will introduce two popular theoretical approaches, namely the resource-based view of the firm (RBV) and transaction cost economics (TCE). These theories have been widely used to explain a host of phenomena in organizations and while they may not fully explain innovative business models, they can add to our understanding about them.

We propose that these two theoretical approaches can contribute to our understanding of new, sustainable business models: 1) the rapid emergence of new business models is – at least to a certain extent – a result of identifying and integrating resources into company operations, which have not been utilised before, and 2) the utilisation of new types of resources is made possible by a reduction of transaction costs – often through advances in information technology (IT). The first part of

our proposal demonstrates the explanatory power of the resource-based view of the firm, while the second part tests the role transaction costs play in the emergence of new business models.

To further explore our propositions, in the following sections we introduce the most relevant aspects of these two theoretical approaches followed by a section, which demonstrates their roles in the emergence of sustainable business models.

The resource-based view of the firm (RBV)

Wernerfelt, in one of his first articles describing the *resource-based view of the firm*, examines different types of resources and looks for the circumstances under which a resource will lead to high returns over longer periods of time (Wernerfelt, 1984). By ‘resource’ he means any strength or weakness of a firm, including both tangible and intangible resources. By comparing the resource-based view of the firm to strategy approaches based on products such as Porter’s five competitive forces (Porter, 1980), Wernerfelt concludes that “optimal management of a resource portfolio is in theory the same as optimal management of a product portfolio, but the two frameworks may highlight different growth avenues” (Wernerfelt, 1984, p. 178.).

Barney demonstrated that no firm can enjoy a sustained competitive advantage if resources are homogeneous and perfectly mobile. He also illuminated the fact that for first-mover advantages to exist in an industry, firms in that industry should be heterogeneous in terms of resources they control. Furthermore, he argues that barriers to entry or mobility are only possible if firms are heterogeneous regarding their resources and if these resources are not perfectly mobile (Barney, 1991).

With these premises, Barney builds a model, according to which for a resource to be able to sustain a competitive advantage (a) it must be valuable, in the sense that it exploits opportunities and/or neutralizes threats in a firm’s environment, (b) must be rare among a firm’s current and potential competition, (c) must be imperfectly imitable, and (d) there cannot be strategically equivalent substitutes for this resource that are valuable but neither rare nor imperfectly imitable” (Barney, 1991, p. 105-106.).

Barney classifies resources into three major categories: physical capital resources, human capital resources and organizational capital resources (Barney, 1991). Physical capital resources include the physical technology used in a firm, while human capital resources relate to the knowledge and skills of individual managers and other employees of a firm. Based on an earlier work by Tomer (1987), by organizational capital resources Barney means “a firm’s formal reporting structure, its

formal and informal planning, controlling and coordinating systems, as well as informal relations among groups within a firm and between a firm and those in its environment” (Barney, 1991).

Further elaborating on the different types of resources, Tomer later concentrates on distinguishing between human capital (HC) and intangible capital (IC), defining the latter as a much broader category than human capital: embodied in individuals, in groups of individuals or in the relationships among individuals and their groups (Tomer, 2012). As such, intangible capital also includes social capital, the formal and informal relationships between groups and individuals. Tomer notes that often adaptation and learning is needed on the part of individuals to realize the full potential of social networks and structures, which he calls hybrid investment or hybrid social capital.

A specific resource, which has received attention in the literature is trust between organisations and organisation and their different stakeholders. Rousseau et al. (1998) provided an overview of issues related to trust in order to work out a cross-disciplinary view and found consensus in the literature regarding the role of trust: it may enable cooperative behaviour, promote adaptive organizational forms (e.g. networks), reduce harmful conflict, decrease transaction costs, facilitate the formulation of work groups and promote responses to crisis (Rousseau et al., 1998).

Transaction cost economics (TCE)

Another dominating idea explaining the existence of the firm and searching for its boundaries, namely *transaction cost theory*, has been elaborated on by Coase and further developed by Williamson.

Coase considered the firm as an alternative to organizing production through market transactions: “within the firm individual bargains between the various co-operating factors of production are eliminated and a market transaction is substituted for an administrative decision” (Coase, 1960, p. 16.). He argues that the differences in transaction costs between markets and hierarchies are primarily responsible for the decisions to internalize some business operations and use markets for others (Coase, 1937).

Among transaction costs, Coase mentions the cost of discovering potential partners, the flow of information between partners, the cost of negotiations leading to a bargain, the finalisation of contracts, and the inspection of whether or not the terms of the contract are being observed by the parties (Coase, 1960). These costs can be grouped into three categories, namely search and information costs, bargaining costs, and policing and enforcement costs.

TCE explains the existence of the firm by the existence of transaction costs and the ability of firms to minimize them in certain transactions.

Further elaborating on the idea, Williamson notes that “TCE examines alternative forms of economic organization with reference to their capacity to economize on bounded rationality while simultaneously safeguarding the transactions in question against the hazards of opportunism” (Williamson, 1996, p. 174.).

According to Williamson (1985) three characteristics of transactions are vital: frequency, uncertainty and asset specificity. A higher level of each of these characteristics will in all likelihood lead to the adoption of internal governance.

Since its early descriptions by Coase and Williamson, transaction cost theory has been used to study various economic phenomena such as vertical and lateral integration, transfer pricing, marketing, the organization of work, franchising, regulations, multinational corporations amongst others (Shelanski et al., 1995).

Recently, TCE has also been used to provide theoretical underpinnings for the spread of internet-based businesses (see, e.g. Teo and Yu (2005) on online buying behaviour and Susarla et al. (2009) on the ‘software as a service’ business model) and the rapidly evolving topic of business sustainability (see, e.g. Zilahy (2007) regarding new, sustainable forms of cooperation between organizations; Acquier et al. (2015) relating to strategic CSR policies in global value chains; Henten and Windekilde (2016) on the role of transaction costs in the emergence of the sharing economy).

Regarding the relationship between the resource-based view and transaction cost theory, Mahoney argues that “market frictions (with asset specificity and small numbers being prominent examples) are the critical concepts of both resource-based theory and transaction cost theory” (Mahoney, 2001, p. 655.). He also notes that the theories can be viewed as being complementary since the resource-based theory is a theory of firm rents, while transaction cost theory is a theory of the existence of the firm: “the two theories can be connected in the following way: resource-based theory seeks to delineate the set of market frictions that would lead to firm growth and sustainable rents, while transaction cost theory seeks to delineate the set of market frictions that explain the existence of the firm” (Mahoney, 2001, p. 655.).

By exploring the explanatory strength of the two theoretical approaches in a specific setting, McIvor (2009) comes to the conclusion that neither transaction cost economics nor the resource-based view can fully explain the complexities of outsourcing decisions. By developing a prescriptive outsourcing framework he demonstrates the utility (and limitations) of integrating the two approaches.

By taking a business model approach, DaSilva and Trkman come to the conclusion that “by studying the roots of the terms and building upon the RBV and TCE, we argue the core of a business model is defined as a combination of resources which through transactions generate value for the company and its customers” (DaSilva – Trkman, 2014, p. 13.).

Sustainable business models in light of RBV and TCE

The following section will introduce two archetypes of business models, namely the sharing economy and industrial symbiosis in order to illustrate the strengths of the theoretical approaches introduced above. Common in these two models is the fact that they have been expected to significantly contribute to the implementation of sustainable development and that experiences with regard to their practical implementation have been accumulating rapidly over the last few years.

Illustration 1: The sharing economy

The sharing economy is a notion, which has emerged as a promising, sustainable alternative to more traditional ways of doing business in many industries, being most prevalent in mobility (e.g. bike- and car-sharing services) and tourism (e.g. community-based internet services), but also present in other sectors (e.g. household appliances and even clothing) where ownership is replaced by renting and sharing.

The original idea of sharing products and resources is not new, but the extensive use of innovative technological platforms (i.e. internet and mobile devices) and the rapid growth of businesses providing them promise significant potential in the industry (see, e.g. Belk, 2014). According to a recent report 44% of the American adult population is familiar with the idea of the sharing economy and 19% of the population has actually engaged in a sharing economy transaction (PWC, 2015a).

The rapid development of the sharing economy is facilitated by technological developments, an increasing scarcity of resources, rapid urbanisation, and demographic and social changes (PWC, 2015a). Looking at the different manifestations of the sharing economy, Benkler suggests that “the highly distributed capital structure of the contemporary communications and computation systems is largely responsible for the increased salience of social sharing as a modality of economic production in those environments” (Benkler, 2004, p. 278.).

As a result, in industry sectors, where ideas of the sharing economy are most popular, the total turnover from sharing-economy services will increase from 15

billion to 335 billion US dollars between 2015 and 2025 and thus will provide half of the whole turnover of the industry in these sectors (PWC, 2015b).

While providing various benefits to its users – and probably to society as a whole – the sharing economy poses important questions for established businesses trying to avoid disruption, new entrants who wish to lure away clients and policy makers who try to regulate and manage the market. One example of the latter is that participants in the sharing economy often exhibit tax-avoiding behaviour, which is hard to uncover for tax authorities. Furthermore, the sharing economy is a broad concept, which can cover businesses with – at least partially – different business models.

By making an effort to identify the main characteristics of goods, which are fit for sharing, Benkler (2004) claims that such goods and resources are “(1) technically “lumpy” and (2) of “mid-grained” granularity” (Benkler, 2004, p. 276.). By “lumpy” he means that these goods provide functionality in discrete packages rather than in a smooth flow. By “granularity” he seeks to capture the “(1) technical characteristics of the functionality-producing goods, (2) the shape of demand for the functionality in a given society, and (3) the amount and distribution of wealth in that society” (Benkler, 2004, p. 277.). A “mid-grained” good is then defined as one with relatively widespread private ownership, which exhibits slack capacity in relation to the demand of their owners.

By taking a resource-based view with regard to the sharing economy, the sustainability debate mainly concentrates on the physical aspects of these new types of businesses (expecting a significant decrease in resource use), but often neglects their impacts on social relationships. However, the sharing economy does not only build on previously underutilised resources such as empty seats in a car, spare apartment space, additional workforce and available time, which are invested in the provision of such services, but also on the trust relationships facilitated by innovative service providers.

Owners and users of resources such as apartment space, empty car seats and underutilised equipment also invest time and effort in transactions, as well as bear a risk inherent in the activities they engage in. Those taking advantage of the services offered also have to trust the providers of services and spend time on engaging with them and the platform providers, e.g. registration, filling in surveys, etc. Time and effort invested in such activities is in excess of that required by traditional operators, e.g. registration is not needed to flag down a cab on the street. Both parties also provide information to platform operators during the course of the transaction and afterwards, which is utilised as a key resource by them later on.

Since physical resources traded in the sharing economy are not owned by platform providers, however

valuable they might be, they alone cannot provide a sustained competitive advantage. On the other hand, by constructing scoring schemes and making them available to their customers, sharing economy platforms capitalise on a resource created by the community and provided for the platform free of charge ‘to assist other users in their decisions’. As a result, this ‘trust bank’ turns into private capital – a very effective source of sustained competitive advantage. Practical experience seems to support this logic as the main differences between platform operators are founded in the number of network members and the ‘trust bank’ built on these and not in their underlying business models or IT solutions they use. As a result, early movers in an industry – assuming that they do not make significant management mistakes – can develop their businesses rather fast and achieve a strong, safe position, which is hard to challenge later.

Thus, by considering the perspective of the resource-based view of the firm, providers of sharing economy solutions, which charge a market-based fee for their services, i.e. the provision of a platform for the actors to locate each other and network, are just like other, more traditional businesses, capitalising on a valuable, rare and hard to imitate/substitute resource: the ‘trust bank’ they created with the free contribution of their users. (This is not to say that other resources are not important for these businesses: apart from the database they build up and can utilize in many ways, their continuously developing applications, which show the characteristics of artificial intelligence, the organizational capital working behind the scenes and lawyers and lobbyist also play important roles in the success of these businesses.) From the point of view of these platform providers, resources actually shared are of less importance as long as they are abundant and users are willing to share them; their quality, price and other attributes play a secondary role. The better utilisation of resources – as expected from these solutions from a sustainability point of view – is also only a by-product – a by-product, which generates goodwill and is often used for marketing purposes.

The role of trust in the sharing economy has recently generated some interest in the literature. An article by Yang et al. (2016) examines Airbnb, the prime accommodation sharing business and the trust built up between its customers and the company, as well as the hosts offering accommodation through its internet based application. Taking an integrated perspective of attachment theory and the trust building model (TBM) they seek to provide a research model that describes trust gaining on-line. The authors argue that Airbnb deals with both informative and social interaction through its website, which thus has cognitive features (e.g. relating to quali-

ty and security) and affective characteristics (e.g. direct communication and real-time responses) and propose a research agenda to show – among others – that cognitive factors influence customer-Airbnb trust, while affect-based factors have a positive influence on customer-host relationships (Yang et al., 2016).

Early schemes of sharing resources, e.g. car sharing systems operated in schools by students, utilised simple technologies, e.g. a billboard to offer free rides, which even if operated effectively, did not reach large crowds of participants, i.e. only students studying in a certain college. The rapid advance of the Internet and mobile devices capable of running simple applications paved the way for the sharing economy by reaching individuals otherwise unconnected and thus providing a critical mass of users making it possible to realise profit in these new markets. Thus, internet-based platforms have become the backbones of the sharing economy.

Henten and Windekilde (2016) analyse the sharing economy from the point of view of transaction cost theory and claim that new digital platforms change the substitutability of traditional services, e.g. offered by a hotel or car rental company, by offering alternative private rooms and car seats. While traditionally these latter goods are more difficult to find and are less standardised thus involving more uncertainty, the use of internet-based services can mitigate many of these shortcomings and the degree of substitution will increase (Henten and Windekilde, 2016).

Using the classification of transaction costs by Coase, the sharing economy benefits from developed internet platforms that help partners discover each other (by using sophisticated search engines, often based on location), communicate with each other and finalize a contract (e.g. a rental agreement). Further, the payment for the provided service is also often made very simple by organizing financial transactions over the internet (sometime even automated, like in the case of Uber).

A closer look at various sharing economy businesses illustrates that both RBV and TCE can explain some of their important aspects even though other factors also play a role in their success.

Illustration 2: Industrial symbiosis

The utilisation of wastes as raw materials has obvious environmental benefits as proposed by many supporters of recycling schemes and more complex industrial ecology (industrial symbioses) solutions.

By mimicking natural ecosystems, industrial ecology aims at the large-scale utilisation of wastes produced by one process as a raw material of another process within or outside firm boundaries. One of the seminal

articles of industrial ecology by Frosch and Gallopoulos (1989) introduced the benefits of an integrated approach to industrial operations necessitated by resource scarcity, increasing consumption patterns and the ever more pressing problem of wastes. They conclude that in order to maintain our high standard of living, both producers and consumers should change their behaviour (Frosch – Gallopoulos, 1989).

While simple recycling activities abound in the developed world, more complex industrial symbiosis networks are still scarce. An often cited example is the Kalundborg industrial symbiosis (see, e.g. Ehrenfeld et al., 1997), but a similar network has been uncovered in Styria, Austria as well (Steiner et al., 2006) – both results of spontaneous processes rather than deliberate planning.

The major motivation behind these schemes is to generate financial gains (savings) and to find environmentally sound solutions to the management of waste through the utilisation of by-products.

If this occurs across the boundaries of the firm, utilisation requires the cooperation of at least two players, but often the engagement of other stakeholders is also needed. For example, industrial park organisations and local governments may have a facilitating role by providing information services, or by adjusting regulations to fit the requirements of the schemes. Industrial park organisations can also influence the composition of the parks (type and number of organisations) and thus have a profound effect on potential relationships between their tenants.

From a resource-based point of view, industrial ecosystems turn worthless (even costly) by-products into valuable resources, which create a market for these resources. Industrial ecosystems provide a double dividend for participating organisations by increasing efficiency and decreasing harmful emissions. Thus, they also create a win-win situation from a sustainability perspective by improving the state of the environment while generating profit.

By-products handed over/traded substitute resources purchased on the market. They may be specific to a certain process or generic, i.e. used by many producers on the market. Wastes, which are homogenous, i.e. generated of a standard quantity and quality, are easier to utilise by other processes.

Industrial ecology solutions concentrating on the utilisation of by-products without taking a more holistic view with regard to production processes may generate benefits, but since resources can often be sourced easily from their primary markets, only deeper, lasting relationships involving the optimisation of processes across different organisations can bring about a sustained competitive advantage. A distinction between

core processes and auxiliary materials is also of interest here, since organisations may be more willing to engage in relationships that concentrate on less important resources than those central to their operations (see, e.g. Halme et al. (2007) for a survey of material efficiency services).

Physical resources circulating in the economy may or may not fulfil the requirements of sustained competitive advantage as set up by Barney (1991) and introduced earlier. Waste paper may be an important, strategic resource for a paper company producing packaging paper, thus it will even build up its own infrastructure to collect waste. On the other hand, other companies, which may source raw materials easily on the market, may not be as interested in engaging in industrial ecosystems (the resource is not rare neither imperfectly imitable).

The establishment of relationships between organizations requires a considerable amount of time and effort, and trust should be built between participating organisations. The scientific literature realised this implementation gap: namely the difference between expected and actually realised levels of industrial symbiosis and identified a number of implementation barriers – many of which relate to the costs of transactions between potential partners as identified by TCE. Barriers most often identified include:

1. The identification of potential partners may take considerable effort because of the specific characteristics of by-products to be utilised. Potential partners may not operate in the same industry and thus have little information about the possibilities.
2. Information regarding the amount, composition and other characteristics of by-products is essential to be able to engage in a transaction.
3. The continuity in the supply (amount, timing, etc.) of by-products plays an important role since supply should meet demand.
4. Geographical proximity is required to reduce transportation costs.
5. Trust between organisations should be developed, which guarantees that by-products will be available/utilised for at least a certain amount of time, so that uncertainties in production can be reduced.

As a result of understanding the required effort and time needed to tackle such a wide array of barriers, organisations are often reluctant to engage in industrial symbiosis relationships and consequently invest their resources elsewhere – as found by Notarnicola et al. in the Italian industrial district of Taranto: “additional uses of the current waste are seen as a diversion of human resources and capital” (Notarnicola et al., 2016, p. 1).

Conclusions

The two introduced case studies, namely the case of the sharing economy and that of industrial symbiosis demonstrate the explanatory power of the resource-based view of the firm and illustrate the role played by transaction costs in the emergence of the two innovative business models.

Both new business models utilise resources, which have been left idle before and thus contribute to a more sustainable economy. There is a difference, however, regarding the resources providing a sustained competitive advantage for their owners. In the case of the sharing economy, a competitive advantage is provided by a resource freely made available by service users (namely the trust-based scoring system, or ‘trust bank’) and resources actually shared are of secondary importance for platform providers. On the other hand, resources shared in an industrial symbiosis scheme are central to the partnership and provide a competitive advantage as long as collaboration and resulting optimisation does not remain at a superficial level.

In both cases, transaction costs play an important role, but while in the case of the sharing economy state-of-the-art information technologies can already reduce these costs to a level, which allows for the widespread use of sharing economy platforms, in the case of industrial symbiosis, transaction costs are often still high, even though some solutions aim to mitigate them, e.g. waste exchanges, electronic platforms, etc. As a result, industrial symbiosis is not as widespread and its future development is still dubious.

Our analysis supported the two propositions we put forward and contributed to the understanding of two emerging business models. We found that resources play a key role in their existence and that transaction costs have an important mediating effect on their market penetration. These findings are in line with other attempts in the literature to combine the resource-based view with transaction cost theory.

Our results are not only useful for researchers in search of the characteristics of emerging business models, but also for policy-makers, who want to better understand them and their impacts on sustainability in order to facilitate positive change in society.

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