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Exploring the Drivers and Moderators of Business Model Innovation

A Case Study of the Dairy Industry

By

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Abstract

The competitive landscape of the dairy industry is changing. In the western markets, the consumption of some traditional dairy products is declining, while plant-based dairy alternatives are seeing double-digit growth. Several factors have contributed to this change, which act as both drivers and moderators of the business model innovation efforts of dairy incumbent firms. The purpose of this thesis was to explore and create a comprehension of these factors. This was done through a qualitative case study of the European and North American markets of the dairy industry and included three sub-cases consisting of dairy incumbent firms. By reviewing existing literature on the notion of business models and business model innovation, a preliminary theoretical framework was formulated, which further guided the data analysis. Both qualitative and quantitative data was collected from secondary sources, however, a qualitative semi-structured interview was also conducted. The results of the analysis indicate that several factors, stemming from the macro-, industry-, and internal environments of dairy incumbent firms, are driving and moderating their business model innovation efforts. This further indicates that firms need to understand the environment in which they operate in order to create aligned efforts of business model innovation.

Keywords: Business model; Business model innovation; Drivers; Moderators; Dairy industry; Dairy incumbent firms; Plant-based dairy.

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– A.M.

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1. Introduction

1.1 Background

Population growth, increasing demands for food, biodiversity loss, sustainability issues, and water use represent some major challenges for food production and agriculture (Mancosu, Snyder, Kyriakakis & Spano, 2015; Pereira, 2017; Rööös, Garnett, Watz & Sjörs, 2018). In the past 30 years, food production has more than doubled and altogether accounts for up to 30% of global greenhouse gas emissions (FAO, 2017; WWF, 2020). Furthermore, agriculture uses an average of 70% of global freshwater for irrigation, while also being a major source of water pollution (FAO, 2017; Foley, Ramankutty, Brauman, Cassidy, Gerber, Johnston, Mueller, O’Connell, Ray, West, Balzer, Bennett, Carpenter, Hill, Monfreda, Polasky, Rockström, Sheehan, Siebert, Tilman & Zaks, 2017; WWF, 2020). Despite the environmental burden, many people are still hungry. More specifically, 750 million people, representing approximately 10% of the world’s population, were exposed to severe food insecurity in 2019 (FAO, 2020). This group of people lived under circumstances where they typically ran out of food, and in many cases went days without eating anything at all (FAO, 2020). Located on the other end of the spectrum are instead the two billion people that are classified as either overweight or obese (IFPRI, 2016; WHO, 2016). Hence, the global food systems are rather ineffective at feeding people in general, as malnutrition in one form or another affects about one third of the entire world population (Rööös et al. 2018). Nevertheless, when taking the growing population into account, which is forecasted to reach 9.7 billion in 2050 (UN, 2019), an estimated 60% more food will be needed by the same year (FAO, 2017). In other words, the food systems are under immense pressure as they need to deliver more (nutritious) food while simultaneously becoming more sustainable.

One possible solution for some of these problems, gaining traction both commercially and scientifically, is the transition to more plant-based eating practices (Pimentel & Pimentel, 2003; de Bakker & Dagevos, 2012; González, Frostell & Carlsson-Kanyama, 2012; Day 2013; PBFA, 2020). A rather illustrating example of such a transition is the rapid growth of plant-based dairy alternatives, which essentially are imitations of traditional dairy products – such as milk, yogurt, cheese, and cooking cream – but made from plants instead of animal-based milk (Ganeshram,

2021). While still in its infancy, the value of the European market for plant-based dairy alternatives has increased approximately 118% since 2014 (Jeske, Zannini & Arendt, 2018; Statista, 2021a).

Even though the research on the subject is characterized by ambiguity and disunity, scholars seem to agree that plant-based foods, in general, are better for the environment in comparison to their animal-based counterparts (e.g. Pimentel & Pimentel, 2003; Sonesson, Davis & Ziegler, 2010; Nijdam, Rood & Westhoek, 2012; González et al. 2012; Day, 2013; Rööös et al. 2018). However, since the nutritional characteristics of plant-based dairy alternatives can vary a lot depending on product type and brand (Bridges, 2018; Chalupa-Krebzdak, Long & Bohrer, 2018), there does not seem to exist any generally accepted conclusions in regard to nutritional performance (Mäkinen, Wanhalinna, Zannini & Arendt, 2016). Despite these ambiguities, the market has had its say and the current trend seems to point towards a future where plant-based dairy alternatives have a given place in many people's daily food consumption.

1.2 Problem Statement

The European market for dairy alternatives is currently worth around \$2.4 billion, and with its rapid pace of growth, it is expected to reach a value of \$4.6 billion in 2025 (Statista, 2021a). Simultaneously, the consumption of some animal-based dairy products, such as cow milk, have steadily declined during the past years in several European countries as well as in the U.S. (Canadian Dairy Information Centre, 2018; USDA, 2020; Jordbruksverket, 2021a; VLAM, 2020). Consequently, about 7.4% of the total U.S. milk market share is now made up of plant-based dairy alternatives, and is further expected to reach 18.5% by 2023 (Schiano, Harwood, Gerard & Drake, 2020). In addition, more than half the consumers of animal-based dairy products in the U.S. are also purchasing plant-based dairy alternatives (McCarthy, Parker, Ameerally, Drake & Drake, 2017), illustrating an increased competition within the dairy industry as plant-based alternatives are winning market share. Consequently, some of the leading dairy companies have added plant-based dairy alternatives to their product portfolios (Tangyu, Muller, Bolten & Wittmann, 2019).

The growth of plant-based dairy alternatives therefore seems to illustrate a tipping point for the dairy industry, meaning that it illustrates a critical point in its life cycle, before which there has

been relative stability but after which a remarkable change has occurred (Gladwell, 2000; Phelps, Adams & Bessant, 2007). This tipping point seems to change the basis of competition within the dairy industry, illustrating a strategic circumstance that might require incumbent firms to make changes to their business models (Johnson, Christensen & Kagermann, 2008).

A business model is essentially a simplified depiction of the relevant activities of a firm (Wirtz, Pistoia, Ullrich & Gottel, 2016) and can broadly be defined as the "...design or architecture of the value creation, delivery, and capture mechanisms..." of a firm (Teece, 2010, p. 172). A business model is not a singular activity, but rather an activity system including several key elements which describes how a firm "does business" with customers and partners (Zott & Amit, 2012). A business model is a dynamic concept, meaning that business models might require being innovated "due to internal or external changes over time" (Wirtz et al. 2016, p. 41), such as the observed changes in the dairy industry. It can even be argued that adjusting the ways of "doing business", as circumstances change, is vital for avoiding crises or even obsolescence (Hamel & Välikangas, 2003; de Reuver, Bouwman, & MacInnes, 2009; Gibe & Kalling, 2019). Business model innovation is therefore essential for firm survival and business performance while also being a source of competitive advantage (Demil & Lecocq, 2010; Chesbrough, 2010; Zott & Amit, 2012; Baden-Fuller & Haefliger, 2013; Casadesus-Masanell & Zhu, 2013).

However, business model innovation is a broad concept and can comprise everything from altering single element of the business model to replacing it with a completely new one (Johnson et al. 2008; Santos, Spector & Van der Heyden, 2009; Demil and Lecocq, 2010; Zott & Amit, 2012; Bock, Opsahl, George, & Gann, 2012; Schneider & Spieth, 2013; Hacklin, Björkdahl & Wallin, 2018; Ramdani, Binsaif & Boukrami, 2019). Regardless of the type of business model innovation that is executed, an alignment between the business model, the firm's internal environment, and the external environment in which the firm operates, should be accomplished (Teece, 2010; Gibe & Kalling, 2019). Hence, it is important to explore the factors that are reshaping the competitive landscape of the dairy industry, as they can be drivers and moderators of firms' business model innovation efforts (de Reuver et al. 2009; Demil & Lecocq, 2010; Sorescu, Frambach, Singh, Rangaswamy & Bridges, 2011).

Despite the emphasized importance of business model innovation, however, there are inconclusive findings about the feasibility of certain types of business model innovation in different contexts. Scholars call for more research on how firms are extending, introducing additional, or replacing existing business models, and how firms can and perhaps should innovate their business models as the environment in which they operate changes (Foss & Saebi, 2017; Ramdani et al. 2019). Therefore, it is of relevance to explore and create a comprehension of the factors that reshape the boundaries of the dairy industry. Such an understanding can further provide an indication of how firms are innovating, and perhaps should innovate, their business models in accordance with the environment.

1.3 Purpose Statement and Research Question

The aim of this study is twofold. Building on the introduction and problem statement, we firstly aim to add theoretical knowledge by addressing the identified research gap about the alignment between business model innovation and the environment in which a firm operates. Secondly, we aim to provide insights for practitioners within the dairy industry. Exploring and comprehending the drivers and moderators of business model innovation, specifically related to the dairy industry, can provide practitioners with a foundation to make more informed decisions that can lead to more aligned efforts of business model innovation. Consequently, this study also intends to provide dairy incumbents with a comprehension of how their business models may be innovated as a response to a changing competitive landscape.

The purpose of this study is therefore to explore and comprehend the factors that might drive and moderate the business model innovation efforts of dairy industry incumbents, and to create an understanding of how aligned efforts of business model innovation may be carried out. Thus, the following research question have been formulated:

- How are external and internal factors affecting the business model innovation efforts of dairy industry incumbent firms?

This question will be addressed by investigating the case of the dairy industry – more specifically the European and North American markets of the dairy industry – and some of its incumbent firms. This will further be elaborated on in chapter 4, where we discuss our methodological choices.

1.4 Thesis Outline

The following chapter, *An Overview of the Dairy Industry*, presents a contextual understanding of the dairy industry that is necessary before moving forward. In this chapter, we begin with presenting a brief history of how the dairy industry has been developed during the past decades, before explaining the different stages that are carried out when producing animal-based dairy products. Following this, the existing literature on business models and business model innovation will be reviewed in the chapter *Literature Review*. In this chapter, we identify three pertinent themes that help create an understanding of the concept of business models. Thereafter, we present the current state of the business model innovation literature along with its drivers and moderators. We finish this chapter by formulating a preliminary framework that further will guide our data analysis. In the following chapter, *Methodology*, we describe the qualitative research approach and the single case study design that characterize this study. We also present an explanation of our data collection, and then move on to discuss how we have operationalized the notion of validity and reliability. Guided by our preliminary framework, we are analyzing the collected data in the subsequent chapter *Analysis*, which we conclude with a revision of the framework. Lastly, the final chapter *Discussion and Conclusions* summarizes our findings and presents both theoretical and practical implications. The findings are also related to the adjacent automotive and meat industries. Finally, we discuss the limitations of the thesis and provide recommendations for further research.

2. An Overview of the Dairy Industry

For thousands of years, milk from animals such as cows, goats, and buffalos have been extracted to produce a range of different dairy products, including cheese, yogurt, and skimmed milk (Copley, Berstan, Dudd, Straker, Payne & Evershed, 2005; Abou-Donia, 2008). Since its beginning, the use of domesticated animals as a source of dairy has continuously expanded and grown into one of the largest sectors of the food industry (Silanikove, Leitner & Merin, 2015). Over the years, new types of dairy products have been developed and, in modern times, taken place in grocery-store refrigerators, but it is essentially the same staple food that is being consumed: animal milk.

However, production-related advancements have, quite naturally, been made over the industry's long lifetime, especially in the western world. Wolf (2003) highlights this by explaining that the US milk production increased with 243% between the period of 1950 and 2000, while the number of cows declined by 58% during the same period of time. These improvements in production efficiency have been made possible through advancements in management, nutrition, genetics, equipment, facilities and technologies (Wolf, 2003). Some practical examples are automated calf feeders, cow activity monitors and automated milking systems (Barkema, Keyserlingk, Kastelic, Lam, Luby & Roy, 2015). In step with these improvements, dairy farms have increased in size (Wolf, 2003). As a consequence, "dairy farms in many world regions are larger and concentrated in fewer hands" (Clay, Garnett & Lorimer, 2020, p. 35), which can be observed in several European countries, such as Denmark (Landbrug & Fødevarer, 2020); the Netherlands; Belgium (BCZ/CBL, 2020); Finland (Natural Resources Institute Finland, 2021); and France (CNIEL, 2020). Even though these changes are clearly observable, they are mostly of an incremental nature, meaning that they have been characterized by relatively minor adjustments to already existing practices (Dewar & Dutton, 1986). Furthermore, these changes mainly refer to the first two stages of the dairy industry value chain (see figure 1).

Kaplinsky (2004, p. 8) defines a value chain as "...the full range of activities which are required to bring a product or service from conception, through the intermediary phases of production, ... delivery to final consumers, and final disposal after use". As can be seen in figure 1, the dairy

industry value chain consists of several stages that are required to be performed before products can be delivered and sold to the end consumers. These activities are in many ways different from each other.

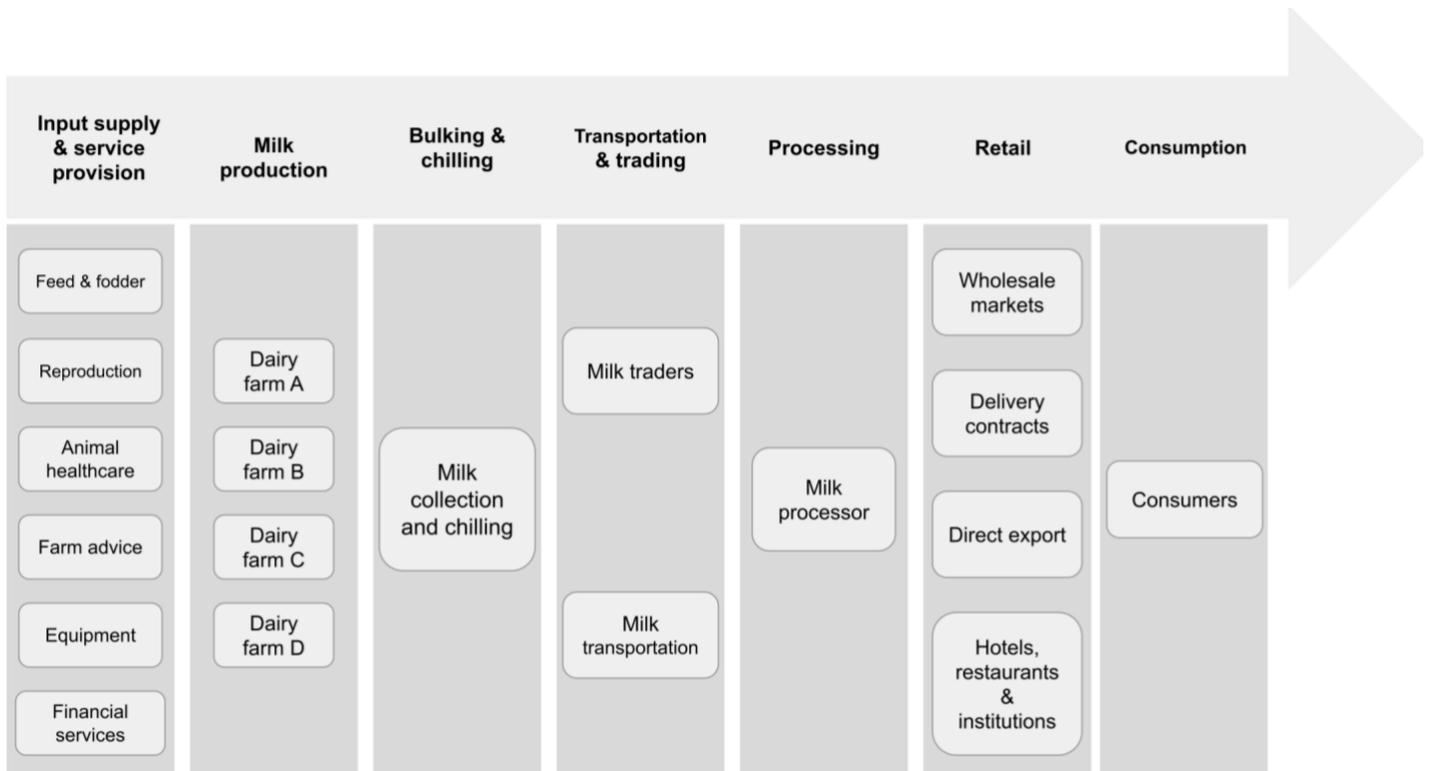


Figure 1: A general dairy industry value chain (adapted from Bachev 2011; Rademaker, Bebe, Lee, Kilelu & Tonui, 2016).

The milk production deals directly with farming activities and milking of animals. This raw milk is then delivered to the milk processors who produce different types of dairy products, before selling them to the end consumers through different channels. It is the dairy processors that are the focal point of this thesis, however, we are not completely disregarding the milk production of the dairy farmers, since there can be differences in regard to the integration of the activities depicted in figure 1 (Bachev, 2011). For instance, some of the largest dairy industry incumbents in the world are cooperatively owned by their dairy farmers, such as Arla and FrieslandCampina (Arla, n.d.a; FrieslandCampina, n.d.; Government of Canada, 2021). Furthermore, many of the largest dairy incumbents have close links to the dairy farms where the raw milk is being produced (e.g., Danone, n.d.a; Lactalis, n.d.a; Unilever, n.d.).

3. Literature Review

With the purpose of creating a foundation for advancing knowledge, the review of prior literature constitutes an essential part of any academic study (Webster & Watson, 2002). Therefore, the subsequent section aims at providing an overview of the extant literature on business models, business model innovation, as well as the drivers and moderators thereof. When searching for this literature, our starting point was rooted in our prior knowledge of the field. As strategic management students, we were in fact already familiar with some of the most prominent journals and scholars in the field of business models and business model innovation, and therefore already had a first set of literature that we could utilize as a base for our literature search. In this sense, we could identify a second set of literature that referred to our primary set, which in turn led to a third set of literature that referred to the second set, and so on. Hence, our search for literature was characterized by a snowball method, where one article led us to another. Additionally, we also read multiple review papers from which we could identify the current state of the research field. These review papers provided a steppingstone towards identifying gaps in the literature and potential areas for further research.

Furthermore, we also searched for literature through keywords and search terms, such as “business models”, “business model innovation”, “antecedents of business model innovation”, “business model management”, “industry pace of change”, “business model dairy industry”, “dairy production” and “plant-based dairy production”. As can be seen, these search terms were not strictly limited to the notion of business models and business model innovation, but also included related concepts and connections to the dairy industry. When scanning the search results and selecting which literature to read, we mainly looked at the number of citations, but also took the year of publishing into account. Primarily since older articles tend to be cited more frequently, which might result in a biased understanding, especially in regard to evolving research fields, such as that of business model innovation (Foss & Saebi, 2017). This resulted in a comprehensive list of articles that we thereafter could review. The literature search was primarily carried out in Google Scholar, but we also utilized LUBSearch to some extent.

3.1 Business Models

From the perspective of strategic management, the concept of business models is important. In fact, financially successful firms attribute as much as twice the emphasis on business model management and innovation in comparison to less financially successful firms (Pohle & Chapman, 2006). Every company has some kind of business model in running, because it is the business model that defines how organizations function; how they create and capture value; how they realize their business objectives; how they develop and maintain relationships within and outside the firm; and how they achieve and sustain their profitability (Chesbrough & Rosenbloom, 2002; Magretta, 2002; Pistoia, Ullrich & Gottel, 2016; Foss & Saebi, 2017; Massa, Tucci & Afuah 2017). A Business model is hence the logic behind the existence of any business and “...thus reflects management’s hypothesis about what customers want, how they want it, and how the enterprise can organize [the resources] to best meet those needs, get paid for doing so, and make a profit” (Teece, 2010, p. 173).

There is no one-size-fits-all business model formula for every industry. Even within a certain industry, different companies have different business models to capture the same value, or to fulfill the needs of the same customers (Peric, Durkin & Vitezic, 2017). Hence, firms’ business models may consist of different components, and the interactions between those components may vary depending on the stage of their life cycles (Jabłoński & Jabłoński, 2016).

Furthermore, firms’ strategies also play a role in the composition of business models. Since a business model interlinks the main elements of the business, and provides a gateway to build a connection between the internal and external environment of the firm, adapting a business model that suits the firms’ strategies and objectives is of great importance (Magretta, 2002; Zott, Amit & Massa, 2011; Kesting & Günzel-Jensen, 2015). Gibe and Kalling (2019, p. 113) also explain that “...one of the key purposes of strategy work is to generate alignment between the core dimensions of the business model for purposes of generating performance...”. Moreover, Casadesus-Masanell and Ricart (2010, p. 212) even goes as far as contending that “a business model is the direct result of strategy but is not, in itself, strategy”. In other words, strategy and business models are two distinct, but interrelated, concepts.

After the technology boom in the 1990s, and especially since year 2000, the business model phenomenon has attracted a lot of attention of both researchers and practitioners, leading to multiple perspectives and different research paradigms (Ghaziani & Ventresca, 2005; Zott et al. 2011; Gorevaya & Khayrullina, 2015; Wirtz et al. 2016). As a consequence, there are a number of review articles (e.g. Casadesus-Masanell & Ricart, 2010; Gorevaya & Khayrullina, 2015; Massa et al. 2017; Wirtz et al. 2016; Peric et. al., 2017; Ritter & Lettl, 2018) that analyze the different comprehensions of the business model concept, while aiming at identifying a converging view of the phenomenon. Following this increasing traction of the concept in management and strategy literature, business models have even begun to emerge as a new unit of analysis (Zott et al. 2011; Peric et al. 2017). To conclude, the notion of business models is highly relevant, and a subject of great interest for both practitioners and researchers.

3.1.1 Origins and Comprehensions

Despite its significance for organizations, and the strong interest for the concept, the understanding of business models is heterogeneous, and there is still a lack of agreement on what constitutes a business model and how different components of business models interact to achieve the financial and strategic goals of the firm (George & Bock, 2011; DaSilva & Trkman, 2014; Gorevaya & Khayrullina, 2015; Wirtz et al. 2016; Massa et al. 2017; Ritter & Lettl, 2018). This debate has resulted in a wide range of perspectives, which in turn have given rise to different research streams and directions regarding the concept of business models. Our following review of extant business literature highlights the various definitions of the business model concept, which has its roots in various management and strategy theories.

Some of these theories have been developed by Michael E. Porter, who has had a strong influence on strategy literature, and consequently on the concept of business models, especially with his five forces framework (1979) and value chain concept (1985). Hence, the definition of business models as tools for firms to create value and a competitive advantage in the industry, in order to perform better than the competition (e.g. Afuah & Tucci 2001; Morris, Schindehutte & Allen, 2005), has its roots in the Porterian point of view. On the other hand, definitions of the business model as a method for identifying internal resources as inputs to business activities, and creating value using

those resources (e.g. Santos et al. 2009; Cavalcante, Kesting & Ulhøi, 2011), has been influenced by the resource-based view (see Barney, 1995, 2001).

Furthermore, the understanding of business models builds a lot on the perceived benefits and results that researchers and practitioners seek to achieve from them. While focusing on achieving performance benefits – which Lima & Baudier (2017) categorize as functional benefits – the concept of business models is centered around output, growth, revenue, and profitability. In this sense, business models may best be described as “...means by which a firm creates and sustains margins or growth” (Euchner & Ganguly, 2014, p. 33).

Additionally, while thinking of achieving cognitive benefits and results – defined by Lima & Baudier (2017) as benefits that facilitate decision making, collaboration and creative thinking to create and deliver value – business models are defined as artefacts or templates that assist practitioners and researchers to look at different internal and external elements in order to create frameworks that link these elements and the interrelationships thereof. In this sense, the connection to strategic planning and management can be observed. To mention some, Porter’s five forces (1979), the value chain concept (1985), the SWOT analysis (Gürel & Tat, 2017), Kaplan and Norton’s balanced scorecard (1996), Barney’s VRIO-framework (1995, 2001) are all influential frameworks that structures ideas in this manner, and thus contributes with tools for comprehending businesses and the environments in which they operate. Similarly, business model frameworks have been developed by several scholars. These frameworks, just as the ones mentioned above, provide practitioners with tools for strategy work and decision making. However, an important distinction is that business models are based on several perspectives and theories, and thus provides a broader understanding than the stand-alone ideas that it builds upon (Gibe & Kalling, 2019). We will discuss some of these frameworks in “Theme 2: Business Models as Visual Frameworks”.

Overall, there are several comprehensions of the business model concept, illustrating a disunity regarding what actually constitutes a business model. These comprehensions build upon multiple different theories and perspectives, and together provides a rather broad understanding of how firms do business. Consequently, there are several research streams and themes that approach the

concept in different ways. In the following section, we have identified three of these themes that we deem especially relevant for the purpose of this study.

3.1.2 Pertinent Themes

Various themes of business models emerge from the different research streams and comprehensions of the concept. However, considering the changes happening in the dairy industry, we have identified three especially relevant overarching research themes. These themes can provide a foundational understanding that is important for comprehending how dairy incumbents may innovate their business models in viable ways, which are aligned with the environment in which they operate.

Theme 1: The Roles of Business Models

The first research theme focuses on the roles of business models, especially in terms of value creation and capture to attain competitive advantages (Afuah & Tucci, 2001; Chesbrough & Rosenbloom, 2002; Casadesus-Masanell & Ricart, 2010; Teece, 2010; Spieth, Schneckenberg & Ricart, 2014; Ritter & Lettl, 2018). Spieth et al. (2014, p. 238) identifies three major roles of business models, including: “(1) *explaining the business*, (2) *running the business* and (3) *developing the business*”.

In its first role, a business model explains the purpose of the firm’s existence and its objectives of performance and survival. Hence, the business model addresses both external and internal stakeholders. In this sense it summarizes the underlying logic of the business and helps answer questions such as “why does a firm exist?”, “what are its objectives?” and “what strategy is it utilizing to achieve its objectives?” (Shafer, Smith & Linder, 2005; Casadesus-Masanell & Ricart, 2010; Wirtz et al. 2016; Ritter & Letti, 2018). As circumstances change, the foundations on which a firm’s existence is rooted in might therefore be subject to change.

In its second role, the business model lays the foundation of all the activities that the firm will perform to execute its strategy. This is the operational aspect of the business model and hence

describes the processes, activities, structures, and linkages between them. In this aspect, the business model can be understood as “...the starting point for planning operative business processes” (eFactors, 2002 cited in Heikkilä & Heikkilä, 2010, p. 11). The detailed operating procedures of the business are defined as a way of clarifying the specific ways in which the firm can generate revenue and profit as an activity system (Zott & Amit, 2012; Hamel, 2000) and as an architecture of product, service, and information flows (Timmers, 1998; Tapscott, Ticoll & Lowy, 2000; Afuah & Tucci, 2001; Dubosson-Torbay, Osterwalder & Pigneur, 2010).

In its third role, the business model facilitates strategic development by identifying opportunities and threats, and responding to them to create and sustain competitive advantages (Morris et al. 2005; Zott & Amit, 2012). This role of the business model is associated with the innovation thereof, which is considered crucial as business conditions change. Hence, firms should adopt a dynamic approach towards business models in which they continuously improve their design and activity system to create, deliver and capture value (Chesbrough & Rosenbloom, 2002; Gambardella & McGahan, 2010; Teece 2010; George & Bock, 2011). A detailed presentation of this issue follows in 3.2 Business Model Innovation.

To conclude, the role-based comprehension of business models “...conceptualize the phenomenon of business models and ... [provide] a more concise grasp on subsequent processes of business model innovation.” (Spieth et al. 2014, p. 241). This theme thus helps to understand the role of dairy incumbents’ business models, and how the nature of these roles might change as the industry and the overall environment changes.

Theme 2: Business Models as Visual Frameworks

The second identified research theme highlights the key processes, components, and elements of business models by creating a visual description and comprehension that explain what a business model consists of (e.g., Johnson et al. 2008; Osterwalder & Pigneur, 2010; Abdelkafi, Makhotin & Posselt, 2013; Cavalcante, 2014). This theme on “...business models is taken by authors who propose structuring business models on the basis of essential elements in order to capture the

important parts of a business” (Ritter & Lettl, 2018, p. 3) and attempts to describe “... as a system, how the pieces of a business fit together” (Magretta, 2002, p. 6).

Johnson et al. (2008) highlights four interlocking elements of business models which include a firms’ customer value proposition, profit formula, key processes, and key resources, that when taken together create and deliver value. Furthermore, a widely adopted business model framework for practitioners is Osterwalder and Pigneur’s business model canvas (Blank, 2013; Lima & Baudier, 2017). Osterwalder & Pigneur (2010) breaks down the business model into nine components or “building blocks” that can be used to describe, analyze, and design it. Abdelkafi et al. (2013) proposes a six-dimensional framework comprising value proposition, creation, communication, capture, dissemination, and development. Similarly, Cavalcante’s (2014) framework consists of three central components, including value creation, *modus operandi* and the value capture mechanism. Lastly, Gibe and Kalling (2019) also presents a business model framework. Their framework consists of five interrelated elements that together illustrates their holistic approach to the concept: (1) the needs of the customers, which are addressed by the firm’s (2) value offering, which in turn is made possible by (3) the activity system, consisting of (4) the firm’s resources and capabilities. All of this takes place in a certain (5) context in which the firm operates.

In terms of content, the above-mentioned frameworks differ in some regards, but all highlight the importance of value creation and capture, i.e. creating value for customers in a profitable way. This is done in the specific context in which a firm operates, which highlights the importance of understanding it, since it consists of both drivers and moderators of business model innovation. Hence, understanding it also presents an opportunity to assess the appropriateness of a business model, and the viability of certain business model innovation efforts. More generally, the frameworks describe the elements, components, and mechanisms, as well as the interrelationships between them, and hence provide visual representations of the business model concept. Such visualizations and comprehensions might help to understand the suitability of certain business model adjustments in relation to changes in the industry and the overall environment in which a firm operates.

Theme 3: The Business Life Cycle and Tipping Points

The third and last theme relates to the connection between a firm's business model and which stage in the life cycle it is located. Although there is a research gap in the extant research regarding business models in the context of the business life cycle, it is a theme that might contribute to establish an understanding about the configuration of business models in mature industries, which the dairy industry is considered to be. This goes in line with the explanation by Jabłoński and Jabłoński (2016), who argue that firms should design their business models differently depending on where they are located in the business life cycle. They explain that "only such a design of the business model and strategy that is consistent with a given stage of company development may ensure an acceptable level of growth and development of the company..." (Jabłoński & Jabłoński, 2016, p. 34). Although different researchers have suggested different numbers of stages, ranging from everything between three to ten (Lester, Parnell & Carraher, 2003), the most central stages in all of the life-cycle literature consists of the (1) introductory, (2) growth, (3) maturity and (4) decline stages (Lippitt & Schmidt, 1967; Griener, 1972; Miller & Friesen, 1984; Smith, Mitchell & Summer, 1985; Kazanijan, 1988; Dodge & Robbins, 1992; Flamholtz, 1995; Abetti, 2000; Beverland & Lockshin, 2001; Lester et al. 2003; Phelps et al. 2007; Jabłoński & Jabłoński, 2016).

Even though the dairy industry is contended to be mature – as it has existed for decades and consists of many well-established incumbent firms – organizational growth and development is not always as linear and sequential as explained in the life-cycle literature. Therefore, Gladwell's (2000) notion of "tipping points" can be used in relation to the life-cycle literature to develop a better comprehension of the circumstances in which dairy industry incumbents are operating.

Tipping points refer to critical points, before which there has been a relative stability, but after which a remarkable change is observed (Gladwell, 2000; Phelps et al. 2007). Phelps and colleagues (2007) contend that these tipping points can be the consequences of environmental changes. Firms therefore need to choose competitive courses of actions appropriate to their stage of development (Lester et al. 2003) and to challenges associated with different tipping points in an evolving situation (Phelps et al. 2007). In order "to navigate beyond the tipping point, the firm must have the capability to identify, acquire and apply new and requisite knowledge to resolve the new

challenges and succeed in a competitive environment” (Phelps et al. 2007, p. 7), highlighting the importance of identifying and understanding the factors that might require incumbent firms to adjust their business models.

3.1.3 Understanding the Concept of Business Models

The three themes elaborated on above together contribute with a foundational understanding of the business model concept. By understanding the roles of business models, how they can be visualized as frameworks and how they relate to the notion of life cycles and tipping points, we contend that it is possible to gain a better understanding of how dairy industry incumbents can innovate their business models in viable ways as the environment in which they operate changes. This is deemed necessary before moving on to reviewing how business model innovation can be carried out, and how it may be driven and moderated by internal and external factors.

3.2 Business Model Innovation

Quite naturally, the research on business model innovation is more recent than that of business models. While the two concepts certainly are related, the notion of business model innovation adds the additional element of innovation into the equation (Foss & Saebi, 2017). In this sense, business model innovation is about finding novel ways to define the customer value proposition, and to create and capture value for customers and partners (Gambardella and McGahan, 2010; Teece, 2010; Bock et al. 2012; Casadesus-Masanell & Zhu, 2013). Business model innovation is thus a dynamic concept that indicates change, renewal and development, which many scholars argue is vital for survival as circumstances change (Hamel & Välikangas, 2003; Demil & Lecocq, 2010; Chesbrough, 2010; Zott & Amit, 2012; Baden-Fuller & Haefliger, 2013; Casadesus-Masanell & Zhu, 2013; Gibe & Kalling, 2019). More specifically, Chesbrough (2010, p. 187) explains that “companies should be seeking and considering improvements to business models – particularly difficult to imitate improvements that add value for customers – at all times”. However, Gibe and Kalling (2019) highlights the risks of constantly experimenting with business models. Altering elements of business models, or changing them entirely, can in fact be very resource-consuming and riskful, and might in the worst case lead to firms becoming strategically irrelevant. Therefore,

firms must also know when the timing is right, and what type of business model innovation that is required under different circumstances, making it a complex task. This also highlights the importance of understanding which and how external and internal factors are driving firms to innovate their business models, and what type of business model innovation that is the most appropriate in relation to those factors. Even though scholars agree on the importance of business model innovation, there is still no coherent definition of the concept and how it is done in practice.

3.2.1 Definitions

The reason for the inconsistent definitions of business model innovation most likely stems from the lack of a jointly formulated conceptualization of the business model (Foss & Saebi, 2017). Though, there are some patterns regarding how scholars seem to define the concept, especially in regard to the degree of novelty and scope of the business model innovation. Some scholars argue that business models only should be innovated when they are completely new or game-changing to an industry (e.g., Johnson et al. 2008) while others take a more gradual approach. Such scholars explain that business model innovation can be radical and game-changing on the one hand, but incremental and gradual on the other hand (e.g., Zott & Amit, 2012; Abdelkafi et al. 2013; Khanagha, Volberda & Oshri, 2014; Pisano, 2015). As mentioned, the conclusions also vary when it comes to the scope of business model innovation (Ramdani et al. 2019). Scholars argue that single components can be changed, that the relationship between components can be altered, that entire business models can be adjusted, and that completely new business models can be created, perhaps besides an already existing one, or as a replacement for it (Johnson et al. 2008; Santos et al. 2009; Demil and Lecocq, 2010; Bock et al. 2012; Zott & Amit, 2012; Schneider & Spieth, 2013; Hacklin et al. 2018). However, Gibe and Kalling (2019) explain that one component of the business model cannot be altered without considering other components. In other words, business model innovation can vary greatly in regard to novelty as well as scope, but should nevertheless be perceived as changes within a system. Below follows an overview by Foss & Saebi (2017, p. 210) of some selected definitions of the business model innovation concept (see table 1).

Table 1: Selected Definitions of Business Model Innovation (Ordered Chronologically)

Author(s)	Definitions
Mitchell and Coles (2004, p. 17)	“By business model innovation, we mean business model replacements that provide product or service offerings to customers and end users that were not previously available. We also refer to the process of developing these novel replacements as business model innovation.”
Markides (2006, p. 20)	“Business model innovation is the discovery of a fundamentally different business model in an existing business.”
Santos et al. (2009, p. 14)	“Business model innovation is a reconfiguration of activities in the existing business model of a firm that is new to the product service market in which the firm competes.”
Aspara et al. (2010, p. 47)	“Initiatives to create novel value by challenging existing industry specific business models, roles and relations in certain geographical market areas.”
Gambardella and McGahan (2010, p. 263)	“Business-model innovation occurs when a firm adopts a novel approach to commercializing its underlying assets.”
Yunus et al. (2010, p. 312)	“Business model innovation is about generating new sources of profit by finding novel value proposition/value constellation combinations.”
Sorescu et al. (2011, p. 7)	“As a change beyond current practice in one or more elements of a retailing business model (i.e. retailing format, activities, and governance) and their interdependencies, thereby modifying the retailer’s organizing logic for value creation and appropriation.”
Zott and Amit (2012)	Innovate business model by redefining (a) content (adding new activities), (b) structure (linking activities differently), and (c) governance (changing parties that do the activities).
Bucherer et al. (2012, p. 184)	“We define business model innovation as a process that deliberately changes the core elements of a firm and its business logic.”
Abdelkafi et al. (2013, p. 13)	“A business model innovation happens when the company

modifies or improves at least one of the value dimensions.”

Aspara et al. (2013, p. 460)

Corporate business model transformation is defined as “a change in the perceived logic of how value is created by the corporation, when it comes to the value-creating links among the corporation’s portfolio of businesses, from one point of time to another.”

Berglund and Sandström
(2013, p. 276)

“A BMI can thus be thought of as the introduction of a new business model aimed to create commercial value.”

Casadesus-Masanell and Zhu
(2013, p. 464)

“At root, business model innovation refers to the search for new logics of the firm and new ways to create and capture value for its stakeholders; it focuses primarily on finding new ways to generate revenues and define value propositions for customers, suppliers, and partners.”

Khanagha et al. (2014, p. 324)

“Business model innovation activities can range from incremental changes in individual components of business models, extension of the existing business model, introduction of parallel business models, right through to disruption of the business model, which may potentially entail replacing the existing model with a fundamentally different one.”

As presented in table 1, Khanagha et al. (2014, p. 324) provides a holistic definition that combines many of these differences into a more coherent conceptualization:

Business model innovation activities can range from incremental changes in individual components of business models, extension of the existing business model, introduction of parallel business models, right through to disruption of the business model, which may potentially entail replacing the existing model with a fundamentally different one.

From their rather comprehensive literature review on business model innovation research, Foss and Saebi (2017, p. 216) provides a similar definition: “designed, novel, nontrivial changes to the key elements of a firm’s business model and/or the architecture linking these elements.” Ramdani et al. (2019, p. 104) also conducted a literature review on the subject and came to a similar conclusion. They write that there is “...in fact a spectrum of various degrees of innovation ranging from modifying a single element, altering multiple elements simultaneously, to changing the

interactions between elements of the business model innovation framework.” Hence, they conclude that business model innovation can be either evolutionary or revolutionary, meaning that firms can continuously fine-tune their existing business model in different ways, or replace it with a completely new one. In line with these holistic definitions, Kukkamalla, Bikfalvi and Arbussa (2020, p. 1) explain that:

Changes happen at the level of value creation, value delivery and value capture. Any change in these dimensions ultimately results in business model innovation which is defined as an activity or process in which core elements of an enterprise and its business rationale are purposely transformed to achieve operational and strategic advancements.

Because of the ambiguity in the definition of what business model innovation is, and how it is being executed in practice, we are applying the holistic approach that has been presented in this section. In this sense, we are not ruling out ways in which firms might innovate their business models. This is especially important as different kinds of business model innovation might be more suitable for some contexts and circumstances than others, which also means that specific factors stemming from specific contexts can drive and moderate the business model innovation efforts in different ways.

3.2.2 Novelty and Scope

As previously described, the degree to which business models may be innovated can vary a lot. On the one hand, business model innovation can be characterized by the modification of single elements, while on the other hand comprising the replacement of an existing model with a completely new one. To make sense of the degree to which business models can be innovated, we present an adapted version of Foss and Saebi’s (2017, p. 217) typology of business model innovation below (see figure 2). The model categorizes the types of business model innovations that firms might perform, in regard to the scope of it, as well as to whom the innovation is new to.

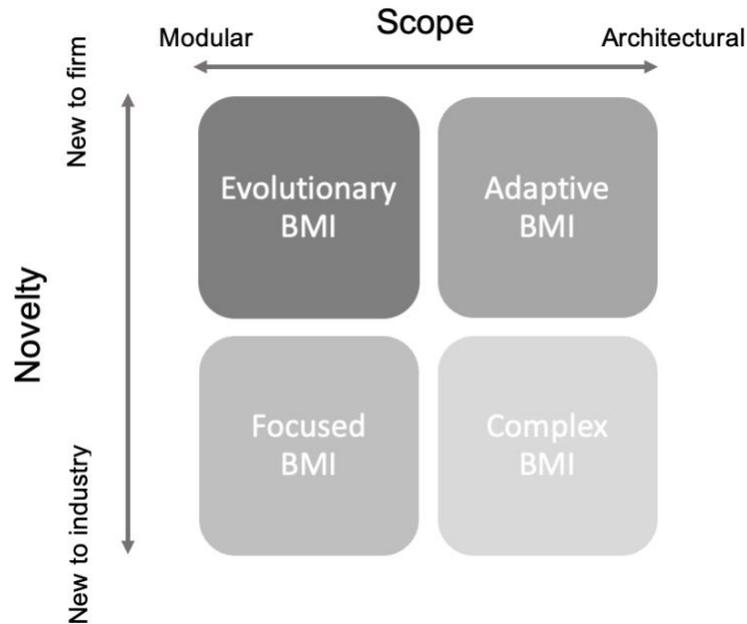


Figure 2: Four types of business model innovation (adapted from Foss & Saebi, 2017, p. 217).

Evolutionary business model innovation is about incrementally fine-tuning individual elements of the business model on a continuous basis (Demil & Lecocq, 2010; Foss & Saebi, 2017; Ramdani et al. 2019). Such changes seem to be the most beneficial and sufficient in circumstances characterized by growth and stability and can therefore be related to the concept of routine innovation, which builds upon the firm’s existing competencies and fits with the already existing business model (Pisano, 2015). Even though evolutionary, or incremental, business model innovation is not revolutionary or game-changing to an entire industry, it can yield very important benefits (Zott & Amit, 2012).

Adaptive business model innovation is similar to that of the evolutionary kind, but instead of introducing or changing single elements of the business model, it deals with the overall design and architecture of the interdependencies of business model elements (Zott & Amit, 2012; Schneider & Spieth, 2013). In this sense, firm activities are linked in novel ways, rather than being replaced by new activities.

In contrast to the above-mentioned types of business model innovations, the focused and complex forms are new to the industry (Foss & Saebi, 2017), which according to Johnson et al. (2008, p. 56) should be the focal point of business model innovation: “pursuing a new business model that’s not new or game-changing to your industry or market is a waste of time and money.” However, as previously mentioned, many scholars argue that this approach is too narrow and that incremental changes indeed can yield very important results.

When it comes to the focused business model innovation, the firm is targeting a completely “...new market that has been ignored by its competition. Hereby, the firm creates a new market while keeping its value proposition, value delivery, and value capture mechanisms intact...” (Foss & Saebi, 2017, p. 217). Similar to the blue ocean strategy (Kim & Mauborgne, 2005), this type of business model innovation aims at making the existing competition irrelevant by targeting and creating a market space where there are currently no competitors, while still keeping many of the core elements of the existing business model. However, the complex type of business model innovation affects the business model as a whole, while simultaneously being new to the industry (Foss & Saebi, 2017). This goes more in line with what Ramdani et al. (2019) phrase as “revolutionary” business model innovation, meaning the process of replacing existing business models with completely new ones.

Even though there is a need for more empirical research to build a more robust typology (Foss & Saebi, 2017), figure 2 provides an overarching comprehension of the different kinds of business model innovations that firms may perform. This comprehension can further be related to the context in which a firm operates, in order to understand its suitability in regard to the specific circumstances. Voelpel, Leibold, and Tekie (2004, p. 259) claim that “...new sources of sustainable competitive advantage can often only be attained from business model reinvention that is based on disruptive innovation and not on incremental change or continuous improvement.” However, the more nuanced perspective presented in figure 2 provides an opportunity to judge a certain type of business model innovation depending on its perceived suitability to the specific context in which the firm operates. In other words, there seem to be both pros and cons with different types of business model innovations, that only may be determined when understanding

the overall context, further highlighting the importance of understanding what factors are driving and moderating the business model innovation efforts of dairy industry incumbent firms.

However, the model (figure 2) does not directly deal with the alternative of introducing a secondary or parallel business model, which could be certainly important as the success of business model innovation not only lies in getting the new business model right. It also lies in assuring that the incumbent business does not prevent the new business model from succeeding (Johnson et al. 2008). This is crucial for incumbent firms as they might introduce a completely new business model separately to their existing one as a response to an emerging opportunity or threat (Hacklin et al. 2018).

3.3 Drivers and Moderators of Business Model Innovation

In a broad sense, the importance of business model innovation builds upon the notion that success does not last forever. Hence, firm performance and competitive advantages are only temporary constructs, and firms must adjust and renew themselves as circumstances change (Hamel & Välikangas, 2003; Chesbrough, 2010; Demil & Lecocq, 2010; Zott & Amit, 2012; Baden-Fuller & Haefliger, 2013; Casadesus-Masanell & Zhu, 2013; Cucculelli & Bettinelli, 2015). The consequences of not adjusting to such changes can in fact be detrimental: “a company that fails to adjust to its changing environment soon loses its relevance, its customers, and, ultimately, the support of its stakeholders” (Hamel & Välikangas, 2003, p. 56). This goes for both internal and external circumstances, as highlighted by Gibe and Kalling (2019, p. 26): “The notion that successful businesses are characterized by harmony between internal and external properties ... is a common assumption among those who write about business models...”. Teece (2010, p. 192) also underscores this by explaining that “good business model design and implementation involves assessing such internal factors as well as external factors concerned with customers, suppliers, and the broader business environment.” In other words, both internal and external factors are driving and moderating firms to innovate their business models.

3.3.1 Internal Factors

From the resource-based view, internal resources and capabilities are major sources of competitive advantage (Barney, 1995, 2001), making it important to take a look inside incumbent firms to comprehend how they may innovate their business models in viable ways. Since internal resources and processes are key elements of any business model – questions regarding the usefulness and suitability of these elements and their interrelatedness therefore comes to the surface.

Hamel and Välikangas (2003) especially underscore the capacity to change before the firm becomes a victim of the circumstances. They phrase this capacity as “resilience”, which consists of four interconnected challenges: (1) the cognitive challenge, (2) the strategic challenge, (3) the political challenge, and (4) the ideological challenge. All of these challenges refer to capabilities rather than material resources, highlighting the importance of well-aware, unbiased and unsentimental strategists who are ready and willing to change the direction of the firm when needed. Foss and Saebi (2017) explain this as “the role of cognition”, which refers to managerial decisions related to business model innovation. Hence, these factors are not only moderators, but might also be driving forces for business model innovation, as strong capabilities to identify and understand when business model innovation is needed can be crucial.

Strategic flexibility is also deemed to be an important internal driver and moderator for business model innovation, as it deals with the flexible use of resources and reconfiguration of processes (Miroshnychenko, Strobl, Matzler & De Massis, 2021). Hence, young upstart firms may have much better flexibility to engage in business model innovation activities than older incumbent firms (Foss & Saebi, 2017). However, this is not a distinction that solely should be based on the age of the firm, and whether it is established or not. The strategic flexibility also seems to differ between different industries. As an example, Gibe and Kalling (2019) explain that the ICT company Axis Communication has added radical innovations to their existing business model without making major changes to their asset base and organization. They explain that a major reason for this is that ICT companies often are less complex in regard to capital-intensive production sites, costly logistics, and established value chains – in contrast to firms in industrial industries (Gibe & Kalling, 2019) such as the dairy or automotive industries.

Furthermore, ownership structure also seems to be an important aspect that affects business model innovation. The ownership structure of a firm may in fact affect the decisions that are taken in regard to strategic issues, such as business model innovation. In publicly traded companies, decisions may be affected by several stakeholders, such as shareholders, senior management, and the board of directors (Tricker, 2019). In privately-owned companies, however, the decision-making may be concentrated in fewer hands. Contrastingly, cooperatively owned organizations are governed by their members, which together form the governance mechanism of the organization (Tricker, 2019). The ownership structure of dairy incumbent firms may hence drive and moderate their business model innovation efforts, as strategic decisions are influenced by this factor. Additionally, in larger corporations, there might exist several business models that need to be managed simultaneously, which may even be in conflict with each other (Markides, 2013; Hacklin et al. 2018). This might very well be the case in the dairy industry, where many incumbent firms consist of well-established and large corporations. Even more so as leading dairy industry incumbents are adding plant-based dairy alternatives to their product portfolios (Tangyu et al. 2019).

To conclude, organizational resources and capabilities act as both drivers and moderators of business model innovation. Therefore, they essentially represent a firm's "ability to maneuver" as the environment in which they operate changes.

3.3.2 External Factors

With external pressure, or drivers, scholars usually refer to changing factors outside of the firm's control (Demil & Lecocq, 2010). Such factors are crucial in order to understand the competitive, but also collaborative and complementary, context in which the concept of business models exist:

Customers will get offerings from competitors, a focal firm can partner with others to build and exploit the best resources, and all actors are dependent on political, economic, social and technological trends in the macro environment that prove to be beneficial to some business models and detrimental to others. (Gibe & Kalling, 2019, p. 73).

Osterwalder, Pigneur and Tucci (2005, p. 17) further highlight the importance of external drivers by arguing that “business models are subject to external pressure and thus constantly subject to change”.

Macro-level Factors

Casadesus-Masanell and Ricart (2010) explain that macro-level factors, such as globalization, deregulation, and technological advancements have deeply changed the competitive landscape for many industries. Hence, since external factors are beyond the control of the firms, a thorough analysis is needed to comprehend strategic threats and opportunities that may have to be acted upon. Sammut-Bonnici and Galea (2015) contend that these exogenous macro-level factors have a major impact on a firm's competitive position in the industry. Understanding them, therefore, helps to evaluate “... how business models will have to evolve to adapt to their environment.” (Sammut-Bonnici & Galea, 2015, p. 1).

There are several tools for analyzing the external environment of a firm or an industry, some of them being PESTEL, SWOT, and scenario analysis (Sammut-Bonnici & Galea, 2015). Each framework has its own advantages and shortcomings and the choice of any framework for the strategic analysis is not a precise science but rather “... a matter of pragmatic choice as to what helps best to identify and explain the issues” (Abdullah & Shamsher, 2011, p. 1147). Hence, to explore the macro-level factors, we are mainly focusing on PESTEL-factors to create an understanding of the broader external environment.

Industry-level Factors: Stability, Pace and Value Migration

External shifts in markets and technologies often drive firms to develop new business models (de Reuver et al. 2009; Khanga et al. 2014). This has, for instance, been illustrated by the opportunities brought by the development of information and communication technologies, which have driven firms to innovate their business models (Pateli & Giaglis, 2005; Wirtz et al. 2016). More generally, Johnson et al. (2008) highlight five circumstances in which firms are recommended to innovate their business models. These circumstances include both opportunities and threats, and are directly related to industry factors: (1) when there is an opportunity, through disruptive innovation, to address the needs of potential customers that before have been shut out of a market, (2) when there is opportunity to capitalize on new technology by wrapping it in a new business model, (3) when there is opportunity to meet an unmet customer need, (4) when low-end disruptors pose a threat and hence needs to be fended off, and (5) when there is a need to respond to a shifting basis of competition.

From these examples, it may seem as though firms only should innovate their business models when an industry is characterized by instability, or when firms are facing major opportunities and threats. However, firms that are operating in stable industries should also innovate and manage their business models continually (Gibe & Kalling, 2019). Because even when an industry is stable, and not exposed to volatile changes, it will experience gradual shifts in consumer preferences and competition, which in turn will present firms with opportunities or threats that they will want or have to act upon. Furthermore, Hamel & Välikangas (2003, p. 54) explain that it is vital "...to change before the case for change becomes desperately obvious". Therefore, firms located in stable industries should still allocate time and resources towards activities such as: implementing their strategy throughout their business model, ensuring a good alignment between the components of their business model, and protecting their business model from, for example, competition (Gibe & Kalling, 2019). In other words, operating in an environment characterized by stability, where the firm already has a good business model in place, does not mean the end of business model innovation. In this sense, the kinds of improvements that should be undertaken are more of an evolutionary and incremental kind but are nevertheless important for the success of the firm (Zott & Amit, 2012).

The stability of the industry also relates to the rate of change in the industry, which is a topic that in itself have been of high interest for many strategic management scholars (e.g. Bourgeois & Eisenhardt, 1988; Brown & Eisenhardt, 1997; D’Aveni, 1994; Williams, 1994; Fine 1998; Eisenhardt and Martin, 2000; Nadkarni & Narayanan, 2007). This concept is often defined as industry clockspeed, and consists of three facets of speed: product, process, and organizational (Fine, 1998; Nadkarni & Narayanan, 2007). Product deals with, as the name suggests, the speed of new product launches. Process indicates the speed at which technologies and processes are changed and replaced in an industry. Lastly, organizational speed demonstrates the rate of change in internal capabilities and strategic actions, which was elaborated on in 3.3.1 Internal Factors.

Furthermore, the notion of value migration can add another dimension to the understanding of how industry-related factors might drive incumbent firms to innovate their business models in different ways. Value migration refers to a shift in value-creating efforts that facilitates a movement of value between firms and business models (Slywotzky, 1996). Relating this to the dairy industry, it can be observed that incumbent firms seem to be facing a tipping point characterized by value outflow, where value is migrating from animal-based products to plant-based dairy alternatives. As value can migrate from outdated business models, perhaps of well-established firms, to new ones that have a better fit concerning what customers value the highest (Slywotzky, 1996), this tipping point may for example stem from changing consumer preferences. The concept of value migration thus helps to understand the structural changes happening in the industry that require business model innovation to sustain value creation and value capture (Johnson & Suskewicz, 2009). Slywotzky (1996) contends that superior business models with better technology, products, and pricing, offer customers a better value proposition, and as a result, customers start moving away from older firms, taking their value with them. This will in turn lead to a decline phase for incumbent firms – if they do not align their business model innovation efforts with the environment in which they operate.

An important aspect to underscore here is the identification of circumstances that will require either change in the primary business model or the creation of parallel business models. To identify and understand such circumstances, Hacklin et al. (2018) introduced the idea of “degree of value migration”. Their research was conducted in the computer and telecommunications industries to

demonstrate how business model innovation was sensitive to industry-wide forces of value migration. They explain that, in circumstances where the degree of value migration is low, the firm's primary business model is not under threat. Thus, "...under lesser degrees of value migration, launching secondary business models may very well sustain or even improve value creation and value capture." (Hacklin et al. 2018, p. 95). On the other hand, a high degree of value migration is characterized by value outflow from incumbent firms to new firms. Under high degrees of value migration, "...pivoting the primary business model improves value creation and value capture at a greater rate than launching new secondary business models that run in parallel to the primary one" (Hacklin et al. 2018, p. 95).

To sum up, the ideas of industry stability, pace, and value migration can together provide a better understanding of how incumbent firms might be driven to innovate their business models due to changes in the environment in which the firm operates. This might be certainly important since:

...one of the most difficult and important challenges for strategic managers is to 'know' – given the entire business model system, including the context – when to change, which elements of the business model to alter and how much: when to be a first-mover and when to focus on cost and consolidation. (Gibe & Kalling, 2019, p. 127).

Creating aligned efforts of business model innovation is in other words a very complex task, which further highlights the relevancy of this study as it attempts to provide comprehension of how internal and external factors can drive and moderate business model innovation efforts.

3.4 Preliminary Framework

From the literature review, three levels of environments have been identified, from which several factors that can drive and moderate business model innovation stem. These factors can result in opportunities, threats, and tipping points, which firms will want or have to act upon, perhaps through business model innovation.

In the macro environment, broad PESTEL-factors that may affect entire industries and societies can be found. Such factors can for instance include deregulation, globalization, and social trends. In the industry environment, consumer preferences, stability, pace, and value migration have been identified as four specific factors that might drive dairy industry incumbents to innovate their business models. These are factors that can reshape the competitive landscape of an industry, and hence require incumbent firms to adjust their business models. Furthermore, in the firm environment, the role of cognition, strategic flexibility, and ownership structure have also been identified as both potential drivers and moderators of business model innovation that might be specifically relevant in regard to dairy industry incumbents. Additionally, technology has further been singled out as an important factor that can be related to all of the three above-mentioned environments – broader technological advancements can affect entire societies, specific industries require certain technologies and resources and hence constitute entry barriers, and individual firms can acquire and develop technologies that perhaps provides competitive advantages within the industry.

All of these factors can be drivers and moderators of different types of business model innovations within the dairy industry, which highlights the importance of exploring and understanding them. It is crucial for firms to create a harmony between internal and external properties (Gibe & Kalling, 2019) which means that certain types of business model innovation can be more or less viable depending on the environment in which a firm operates. However, the research is still scarce in regard to the alignment between business model innovation efforts and external circumstances (Foss & Saebi, 2017; Ramdani et al. 2019).

The above-mentioned environments and factors represent the basis of our preliminary framework, which is illustrated in figure 3 below. In the framework, the relationships between the factors and environments are also represented. Following the template approach, this framework will act as a guide for our upcoming data analysis. Though, the preliminary nature of it should be highlighted, as the themes it consists of are to be tested empirically (King, 2004). This also goes in line with the exploratory character of this study, as we are aiming to address an issue within a context where the research, to our knowledge, is scarce.

However, there are potential pitfalls with the template approach that should be addressed. Having too many predefined themes, or codes, can for instance prevent researchers from considering data that are in conflict with the preliminary framework (King, 2004). Having too few themes, on the other hand, may instead result in the lack of a clear direction for analyzing the empirical data (King, 2004). We have therefore aimed at finding the delicate balance between too many and too few predefined themes.

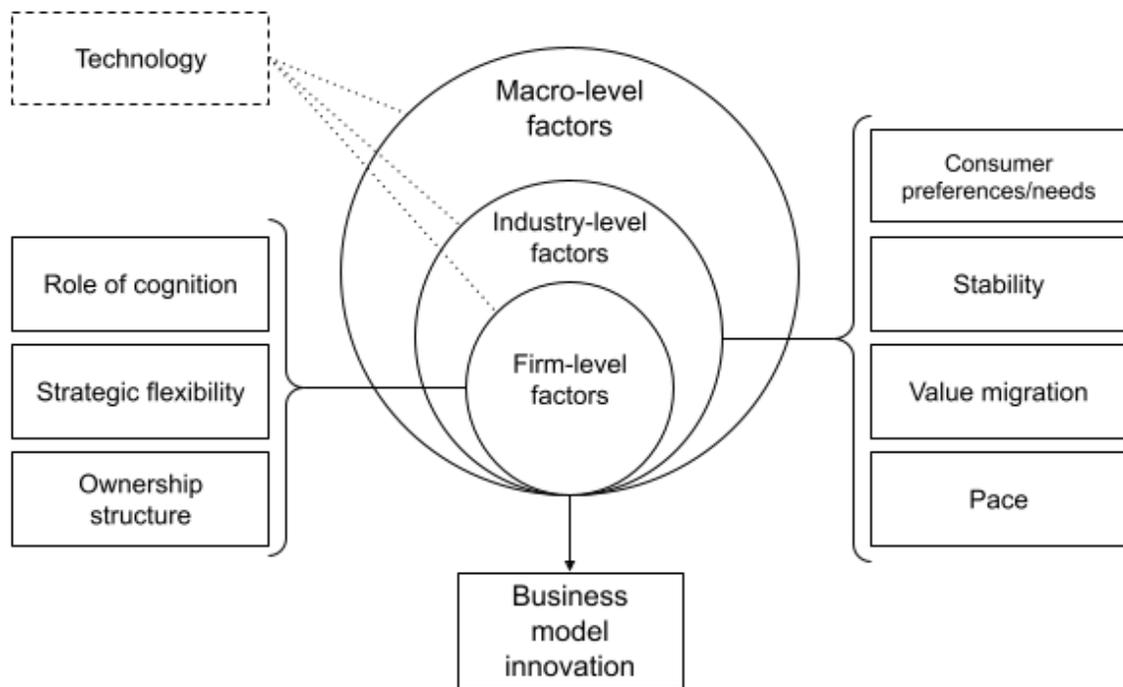


Figure 3: Preliminary framework (created by authors based on the literature review).

4. Methodology

4.1 Research Approach

In order to create an understanding of the factors that are driving and moderating the business model innovation efforts of dairy industry incumbents, a qualitative approach is taken. A major reason for this approach is due to the exploratory nature of this study, which certainly is relevant as the variables are not widely accepted and established (Creswell & Creswell, 2018). In other words, there does not seem to exist a general comprehension of the factors that might drive and moderate business model innovation in the dairy industry, nor how business model innovation can be carried out by dairy industry incumbents in viable ways. Foss and Saebi (2017, p. 221) underscore this by explaining that the “BMI [business model innovation] literature is characterized by conceptual ambiguity and disconnected research efforts”. A quantitative approach, which aims to test and verify statistical relationships between variables (Bryman & Bell, 2011), would therefore not be viable.

Historically, qualitative research has often been synonymous with an inductive research approach, while quantitative research has been associated with a deductive approach. The main difference between the two approaches is their relationship with theory – the inductive approach aims to generate theory out of data, while the deductive approach has its starting point in theory, as hypotheses derived from existing theories are being tested empirically (Bryman & Bell, 2011). However, Bryman and Bell (2011) explain that there are several weaknesses with treating these approaches as clear-cut research strategies, why they instead may be treated as tendencies in research projects. Therefore, we are taking an abductive approach, which uses aspects of both the inductive and deductive approaches and is characterized by an ongoing alternation between empirical and theoretical reflection (Alvehus, 2013). We deem the abductive approach to be the most appropriate as we aim to explore a phenomenon in a context where the research, to our knowledge, is scarce. This is further highlighted by Dubois and Gadde (2002), who explains that the abductive approach is rather fruitful when researchers aim to discover new things. Hence, empirical insights have together with theoretical reflections been guiding the direction of this study in an alternating fashion. Our preliminary framework (see figure 3) has therefore not solely been

formulated from theory, but also from empirical insights that have guided us towards certain themes and elements deemed to be especially important for the purpose of this study.

4.2 Research Design

As this study aims to provide understandings that primarily relate to the specific context of the dairy industry, a case study design is chosen. The case study design constitutes a way of researching a complex phenomenon within a certain context (Baxter & Jack, 2008) and emphasizes on a bounded situation or system (Bryman & Bell, 2011). The case study design is thus suitable for research that aims to answer questions starting with “how” and “why”, and that are investigating topics where the contextual conditions are relevant to the phenomenon that is being studied (Yin, 2003). Hence, the case study constitutes an adequate research design in relation to the research question that we aim to address, which is an important aspect of research (Bryman & Bell, 2011).

Other research designs, such as a survey design or an experimental design would therefore not be appropriate as they “share a common goal of helping the researcher make inferences about relationships among variables, and how the sample results may generalize to a broader population of interest...” (Creswell & Creswell, 2018, p. 207). This stands in contrast to the case study design that enables us to “...explore or describe a phenomenon in context using a variety of data sources” (Baxter & Jack, 2008, p. 544). Hence, the case study design also allows us to explore and understand the phenomenon of business model innovation within the context of the dairy industry, using both qualitative and quantitative data. These different types of data can then be combined when conducting the analysis, making it possible to understand a phenomenon through multiple “lenses” and thus gain a more holistic understanding (Baxter & Jack, 2008).

However, there are different types of case study designs, which are more or less fitted for different purposes. A general difference between the case study designs is the number of cases that are being investigated. The single case study aims to produce an intensive examination of one case, while the multiple-case study allows for insights to be compared between two or more cases (Bryman & Bell, 2011). Hence, the multiple-case design is often chosen for the purpose of comparing cases,

as it enables researchers to explore differences between and within cases (Yin, 2003). Although learnings from other industries can be fruitful when addressing the research question of this study, the single case study provides an opportunity to do a more detailed and rich analysis (Stake, 1995), which we deem is crucial in order to understand the unique context of the dairy industry. Especially since business model innovation efforts can be driven and moderated by several internal and external factors.

Although a strength of the multiple-case study is that it enables researchers to better establish circumstances in which a theory will or will not hold (Eisenhardt, 1989; Yin, 2003), it is not the purpose of this study to produce generalizable results. Yin (2003) highlights this by explaining that a single case study design is the best choice when a researcher aims to study one thing, such as one industry. As we intend to study the dairy industry, and more specifically the European and North American markets of the dairy industry, the single case study design is therefore deemed to be an adequate choice. However, to reap some of the benefits of the multiple-case study design, the results of the dairy industry analysis will also be related to the automotive and meat industries, as they represent two industries that are moving in a similar direction. Hence, the results of this study are related to similar circumstances, which will strengthen the validity of the study.

Furthermore, since industries are composed of firms, it is important to include the incumbent firms of the dairy industry as subunits. Arla, Danone and Kavli have therefore been chosen as the subunits that are located within the larger case of the dairy industry. The selection of incumbent firms is partly based on the fact that they have already entered the plant-based dairy segment, and therefore present particular opportunities for learning, and for addressing the purpose of this study. The incumbent firms are also selected due to the differences in ownership structure – Danone is publicly owned, and its shares are traded on Euronext Paris (Danone, n.d.b); Arla is cooperatively owned by their dairy farmers (Arla, n.d.a); and Kavli is owned by the Kavli trust “O. Kavli & Knut Kavlis Almennyttige Fond” (Kavli, n.d.a). Moreover, the selection is also based on their geographical presence, size, and access to primary data. Arla, Danone, and Kavli are all operating in the western markets of the dairy industry, which constitute the focal point of this study. Arla and Danone further represent two of the largest dairy firms in the world, while Kavli was chosen based on the fact that we have conducted an interview with a business developer from their

Swedish branch. The selection of three firms is to allow for variation, which is important as internal and external factors can affect the business model innovation efforts of different firms differently. Furthermore, what constitutes a viable business model innovation for one firm might not be viable for another, although they are operating within the same industry. The choice of three firms rather than four or more is based on the limitation of time and word count.

4.3 Data Collection

In order to get access to study participants, researchers must obtain necessary permissions from so-called gatekeepers (Creswell & Cresswell, 2018). This certainly holds true for research that calls for primary data, where the study requires researchers to gain access to a closed setting, such as an organization (Bryman & Bell, 2011). This was in fact our initial plan for this thesis, as we wanted to dig deeper into how dairy industry incumbents had already innovated their business models. However, "...gaining access to most organizations is not a matter to be taken lightly but one that involves some combination of strategic planning, hard work and dumb luck" (Van Maanen & Kolb, 1985, p. 11). We indeed got to experience this, as we spent days calling, e-mailing, and sending LinkedIn-messages to multiple dairy incumbents as well as people working within such organizations. Arla, Lactalis, Danone, Unilever, Valio, Kavli, and Nestlé include some of the firms that we reached out to.

The difficulty of gaining access to organizations partly stems from the fact that the interests of researchers and practitioners can differ quite a lot. Hammersley (1992) explains that practitioners most likely are interested in insights that can help them solve problems they are confronted with, which may not always be aligned with addressing theoretical problems. Hence, when reaching out to the organizations and people we deemed relevant for the purpose of our study, we underscored that the thesis could provide both theoretical and practical insights of importance for their strategic work. However, our success was rather limited as we only got the opportunity to conduct one interview.

The interview that we conducted was semi-structured, as we had a series of rather general questions (see Appendix A) that allowed us to ask further questions in response to the replies that we

perceived to be significant (Bryman & Bell, 2011). The interview was conducted with a business developer who works at O. Kavli AB, which is Kavli's Swedish branch. It lasted for about an hour and was carried out through Zoom. The interview was conducted in Swedish, but the answers were later translated into English when the Swedish-speaking one of us transcribed¹ it. The limitation of only conducting one, or a very small number of interviews, is that only a limited number of perspectives can be represented. This can of course be problematic as qualitative interviews emphasize the understanding of the meaning individuals ascribe to an issue (Bryman & Bell, 2011). The validity of one voice alone might therefore be limited.

In other words, our initial plan of collecting primary data did not work out, which highlights the importance of always thinking about the anticipated problems and difficulties of a research plan (Bryman & Bell, 2011). The focus was therefore directed to our alternative research plan, which instead built upon conducting secondary data analysis. Through our alternative plan, we raised our unit of analysis from a firm-level to an industry-level, with the firms as subunits. This shift consequently created a need for additional data sources. The focus was hence directed towards secondary sources of data, meaning data that already exists "out there" and is waiting to be collected and analyzed by the researcher (Bryman & Bell, 2011). The secondary data sources that we used are together categorized as documents and include scientific journals, statistics, annual reports of dairy industry incumbents, consultancy reports, industry reports, and websites. Hence, both qualitative and quantitative data have been collected. These different types and sources of data have helped us to describe and understand the context of the dairy industry in a deeper way than would have been possible with only one type of data. According to Dyer and Wilkins (1991), this is an important aspect of case studies as the context should be described in a way that enables the reader to understand it, and that theory can be produced in relation to it. However, this does not mean that the number of pages is the key issue, which further highlights the benefits of using several data sources to present a better description and understanding of the case.

¹ When presenting this data in the analysis, three dots (...) have been added when one sentence is excluded, and four dots (....) when two or more sentences have been excluded. Square brackets have been used when an additional word or sentence is added to clarify a quote.

A preconception in regard to the collection of such data is that it is easier and more comfortable to collect than primary data. However, as it just exists “out there”, it needs to be searched for, located, and retrieved, which can be a frustrating and ongoing process (Bryman & Bell, 2011). In practical terms, the collection of secondary data required us to sort through hundreds of pdf-files and websites, search for large amounts of statistical data, and spend time locating data that we already knew existed. The majority of this data was searched for and retrieved through Google Scholar, LUBsearch, Statista, and Retriever Business, but searches in Google’s regular search engine were also conducted.

Our search strategy was mainly guided by our pre-understandings of the selected case, i.e. the dairy industry. Before beginning to search for secondary data about the dairy industry, we had in fact already mapped data from multiple sources as preparatory work for this thesis. However, as mentioned above, searching for secondary data was not a linear process, but rather frustrating and ongoing.

This process further sheds light on another issue – that all data cannot be represented. As this thesis has been produced within a limited time frame, there is most likely secondary data “out there” that we have not had resources to search for and investigate. The limited word count further rules out the option of presenting all the data that we actually have investigated. However, as we are conducting a qualitative study, it is not our intention to present an account of “the absolute truth”. According to Guba and Lincoln (1994), there can be more than one account, meaning that we are rather presenting *a* truth from what the data we have investigated enables us to interpret and understand.

4.4 Validity and Reliability

In order to uphold a certain level of research quality, we have continuously reflected upon the validity and reliability of this study and made choices to fulfill the criteria which they comprise. In qualitative research, the criterion of validity constitutes one internal and one external aspect and is essentially referring to checking the accuracy of the findings (Creswell & Cresswell, 2018). Internal validity, which also is referred to as credibility, deals with the trustworthiness of the social

reality that a researcher presents (Bryman & Bell, 2011). This criterion is certainly important to this study due to its qualitative nature, which means that we are presenting *a* truth rather than “the absolute truth”. However, since we only have conducted one interview, methods such as “member validation” have not been utilized. Instead, we have fulfilled the criteria of internal validity by triangulating data. As mentioned before, this is a strength of the case study design as it allows researchers to view and explore a phenomenon from multiple perspectives (Baxter & Jack, 2008). Moreover, we deem this approach to be certainly appropriate as the notion of business models is very broad and comprises many different factors which best can be understood by viewing them from different perspectives. By utilizing both qualitative and quantitative data from different sources we have thus been able to examine their credibility, which constitutes a process that adds to the validity of the study (Creswell & Creswell, 2018).

The other criterion of validity refers to the external validity, or the transferability. This essentially deals with the issue of generalizability, meaning the degree to which the findings of a study can be generalized to other contexts (Bryman & Bell, 2011). Since it is not the purpose of the single case study design to generalize its findings to other circumstances beyond the specific case, the external validity of such studies is generally limited (Bryman & Bell, 2011). However, we have related our results to the automotive and meat industries since they represent two industries that are moving in a similar direction as the dairy industry. In this sense, we have strengthened the external validity as our results can be evaluated in relation to other, similar industries. However, since these industries have several characteristics in common, we are not suggesting that our results can be generalized to broader and drastically different contexts, meaning that the external validity is still limited.

Reliability, on the other hand, refers to how researchers determine if their approaches are consistent and stable (Creswell & Creswell, 2018). In qualitative research, this criterion mainly deals with the documentation and assessment of the research decisions that have been made throughout a study (Bryman & Bell, 2011). We have primarily dealt with this criterion by being as transparent as possible in this thesis, and by explaining the underlying reasons for our decisions. We have also kept records of most of the empirical data that have been collected and investigated, as the limitations of this study have restricted us from presenting and analyzing all data.

5. Analysis

As we are taking a template approach, the following data analysis has been guided by our preliminary framework (see figure 3). This section is therefore structured by the themes of the framework, in contrast to first presenting empirical insights and then analyzing them. In this sense, data analysis partially occurred alongside the collection of it. The confirming-evidence bias represents a potential pitfall for this approach, as it refers to “...selectively seek[ing] out confirming evidence to justify our initial inclination.” (Hammond, Keeney, Raiffa, 2006, p. 126). However, not having any, or too few, predefined themes can lead to the lack of a clear direction (King, 2004). Hence, presenting empirical data without any guiding themes would have been difficult due to the limited number of pages of this thesis. Especially since our empirical data primarily have been collected from secondary sources, and is both heterogeneous and substantially large, which highlights the difficulty of identifying meaningful themes from it. Combining the empirical insights with theoretical analysis is therefore a viable approach to make sense of the collected data. In the following sections, we will hence present the selected incumbent firms, consisting of Arla, Danone, and Kavli, and thereafter present and analyze the dairy industry from the themes of our preliminary framework. Lastly, a revised and elaborated framework will be presented.

5.1 Incumbent Firms

5.1.1 Arla Foods

The history of Arla dates back to 1880 when dairy farmers in Denmark and Sweden formed small cooperatives to invest in common production facilities. Over the years, the small cooperatives merged and became larger and stronger. In step with this, they expanded from local to regional to national cooperatives. In 2000, the largest Danish dairy cooperative merged with its Swedish counterparts and together formed Arla Foods (Arla, n.d.b). Today, Arla consists of 9400 owners located in Sweden, Denmark, Great Britain, Germany, Belgium, Luxemburg, and the Netherlands. Each owner has one vote in the “cooperative democracy” (Arla, n.d.c).

Arla has several brands in their product portfolio, such as Lurpak, Skyr, Castello, Bregott, and Cocio (Arla, n.d.d). These brands consist of a wide range of animal-based dairy products, such as cheese, flavoured milk, butter, and yogurt. However, in 2020, Arla announced that they will enter the market for plant-based dairy alternatives as well. Under their new umbrella brand, named Jörd, Arla will launch three oat drinks in Denmark, the United Kingdom, and Sweden (Arla, 2020a). “[Animal-based/cow] Milk will always be at the heart of Arla’s business and the key ingredient in the vast majority of the products” but Arla also has a strong ambition to become a significant player in the plant-based segment within the coming years (Arla, 2020, n.p.).

Financially, Arla’s performance is contended to be strong. Between the period of 2017–2020, their revenue slowly but steadily increased from €10.3 billion to €10.6 billion. During the same period of time, their profit increased from €299 million to €352 million (Arla Foods, 2017, 2018, 2019, 2020).

5.1.2 Danone

The history of Danone dates back to the 1920s when the first Danone yogurt started being sold to pharmacies (Danone, n.d.c). Since then, Danone has grown to become the global leader in fresh animal- and plant-based dairy products, from which 52% of their total revenue is generated (Annual report, 2019). The other portion of their revenue is generated from their offering of waters, early life nutrition, as well as medical nutrition. Danone is present in over 120 countries and has more than 100.000 employees in over 55 countries. Their top three brands in 2020, in sales percentage, were (1) Activia, (2), Aptamil, and (3) Danone. Europe and North America are the largest markets for Danone, in which 54% of their revenue is created (Danone, 2019).

Danone experienced a strong profitability growth in the fresh dairy market from 2010 to 2013, where revenues soared from €17 billion to €21.3 billion (Danone, 2010, p. 29; Danone, 2013, p. 13). From 2014 to 2016, sales for dairy products, however, declined to €10.7 billion (Danone, 2016a). To meet the challenges of declining growth and to generate new revenue streams, Danone entered the market of plant-based dairy alternatives with the acquisition of WhiteWave in 2017, under the brand names of *Silk*, *So Delicious*, and *Alpro* (Danone 2017, 2017b). The sales for dairy

and plant-based products of Danone have since steadily increased from €8.4 billion to €13.2 billion from 2017 to 2019 (Danone, 2017, p. 60; Danone 2019, p. 5).

5.1.3 Kavli

Kavli was founded in 1893 in Norway and has since then grown into a multinational food corporation with yearly revenue of approximately SEK 3.2 billion (Kavli, n.d.b; Kavlifonden, n.d.). Kavli operates in Norway, Sweden, Finland, and the UK. However, since we have conducted an interview with a business developer at Kavli's Swedish branch, O. Kavli AB, we are primarily presenting data regarding this part of their business. Between 2016 and 2019, O. Kavli's revenue increased by SEK 145 million (O. Kavli, 2016, 2017, 2018, 2019). However, their profitability declined, as it decreased by SEK 25 million in total between the same period of time, i.e. between 2016-2019.

Kavli has several brands in their product portfolio, such as Druvan, Johnny's, Bärri and Bollnäsfil (Kavli, n.d.c). Hence, they are not only a dairy producer but are offering other types of products as well, such as sauce and vinegar. Furthermore, they are also producers of plant-based dairy alternatives, which goes under their brand of Planti (Planti, n.d.a).

5.2 Macro-level Factors

The most important macro-level factors for the western markets of the dairy industry seem to be animal welfare, sustainability, and health. The strength of these factors is on the one hand reinforced by regulation and political intervention, which refers to "the extent to which policy-makers are likely to intervene in the commercial environment ..." (Sammut-Bonnici & Galea, 2015, p. 1). On the other hand, they are strengthened by social trends, which "... dictate work patterns and attitudes, consumer tastes and preferences, and the particular type, form, and volume of demand for a product or service." (Sammut-Bonnici & Galea, 2015, p. 4). These factors influence dairy incumbent firms in several ways.

5.2.1 Animal Welfare

There are several policies and regulations that govern how farm animals should be treated. In the EU, for instance, "... the European Commission has been promoting animal welfare for over 40 years gradually improving the lives of farm animals" through rules and directives (European Commission, online, n.p.a). In line with such policies, the proportion of organic dairy farms have increased on a global level (Barkema et al. 2015). The regulations for organic dairying can differ among countries but in general, "... organic farms must consistently adhere to a strict set of regulations that differ in many ways from those on conventional farms." (Barkema et al. 2015, p. 7429). In Sweden, for example, the basic rule for organic farming is that cows and other animals are free-range (Jordbruksverket, 2021b).

In addition to such regulations and policies, animal welfare is a factor that is strengthened by social trends. The interest for the care and housing of dairy cows and their associated products have increased in more recent years (Von Keyserlingk, Rushen, Pasillé & Weary, 2009). More than two-thirds of U.S. consumers now want their food supply to be less based on cruelty towards farm animals (Statista, 2020a, p. 42). The number of new food and beverages that are launched with the claim "animal welfare" has also increased (Nutraceuticals World, 2016). Moreover, the social concerns regarding animal welfare were also highlighted in 2020, when one of Arla's farms in Sweden was inspected and demonstrated to be greatly flawed in regard to animal welfare. These announcements were met with a storm of criticism from the public. Arla was rather quick to sell the farm and move the animals after the incident was exposed (Arla, n.d.e).

Hence, both dairy farms and processors are, directly or indirectly, affected by the regulations and social concerns about animal welfare.

5.2.2 Sustainability

Another important dimension of the dairy industry that is regulated by governments and regulatory agencies is sustainability. One of the aims of the common agricultural policy (CAP) of the EU is for instance to promote sustainable farming and to help tackle climate change (European Commission, n.d.b). However, general policies such as the Paris Agreement are also important regulatory factors. The global food systems, in which the dairy industry is a part of, are in fact major contributors to climate change and environmental degradation (Mancosu et al. 2015; Pereira, 2017; Rööös et al. 2018). Altogether they account for up to 30% of global greenhouse gas emissions (FAO, 2017; WWF, 2020), and one of the main aims of the Paris Agreement is precisely to reduce such emissions (European Commission, n.d.c).

Increased reporting on sustainability highlights the enlarged importance. Almost 80% of the N100 companies in the world are now reporting on sustainability, and more companies are presenting more environmental, social, and corporate governance (ESG) information than legally required (KPMG, 2020a, 2020b). In line with this, several dairy industry incumbents, such as Arla, Danone, Lactalis, and Nestlé, self-reportedly put much emphasis on sustainability in their operations (Arla, n.d.f; Lactalis, n.d.b; Nestlé, n.d.). Danone (2019, p. 9) states that:

While focusing on our 2030 Goals to shape the future of food together with our partners, we will invest about €2 billion over three years to further transform our agriculture, energy and operations, packaging, and digital capabilities so that we will fully leverage our climate action to create a virtuous cycle, fuel a superior growth model and create value for all.

In general, consumers in several countries have also been shown to value sustainability a lot, especially when it comes to the younger generations (Statista, 2020a, p. 28). In Sweden, 68% consider sustainability to be very important (Insight Intelligence, 2020). For online shoppers in Denmark, 49% perceive sustainability to be important (FDIH, 2020). Furthermore, 53% of consumers in the Netherlands said that they paid attention to the sustainability of products in 2020, in comparison to 25% in 2010 (b-open, 2020). Although a majority believe sustainability will

remain an important issue, not all agree. For instance, 19% of consumers in the U.S. believe that sustainability is a buzzword that will lose importance in the future (Statista, 2021b, p. 8).

The notion of sustainability further directs focus towards plant-based dairy alternatives as they are deemed more environmentally friendly in comparison to their animal-based counterparts (Pimentel & Pimentel, 2003; Sonesson, et al. 2010; Nijdam et al. 2012; González et al. 2012; Day, 2013; Rööß et al. 2018). Consumers have for example been shown to perceive the negative effect of plant-based dairy alternatives on the environment to be lesser than cow-based milk (McCarthy et al. 2017). Hence, sustainability is not only emphasized due to regulatory reasons. This goes in line with the rather large numbers of people who are in favor of meat-free diets, especially in countries like Germany and the UK (Statista, 2020a, p. 16). Accordingly, Veganuary – the world’s largest vegan movement – has for instance seen a surge in subscribers (Statista, 2020a, p. 19). In 2021, “Veganuary inspired and supported more than half a million people to try vegan during our 2021 campaign” (Veganuary, online, n.p.).

However, the environmental impact can vary a lot between different plant-based dairy alternatives, making it difficult to assess the sustainability of plant-based dairy alternatives as one homogenous category. In other words, there are both pros and cons with different alternatives, but in general, plant-based alternatives are more environmentally friendly than animal-based products. While Jeske et al. (2018) contend that soy production is a threat to the environment in South America, estimates from the United States Department of Agriculture (USDA) indicate that the food industry² only is responsible for less than 10% of the global production of soy (see figure 4). The majority of soy is mainly produced for feeding farm animals, and the damage is therefore not caused by the production of plant-based foods and dairy alternatives.

² The “food industry” refers to the production of food and beverages based on soy.

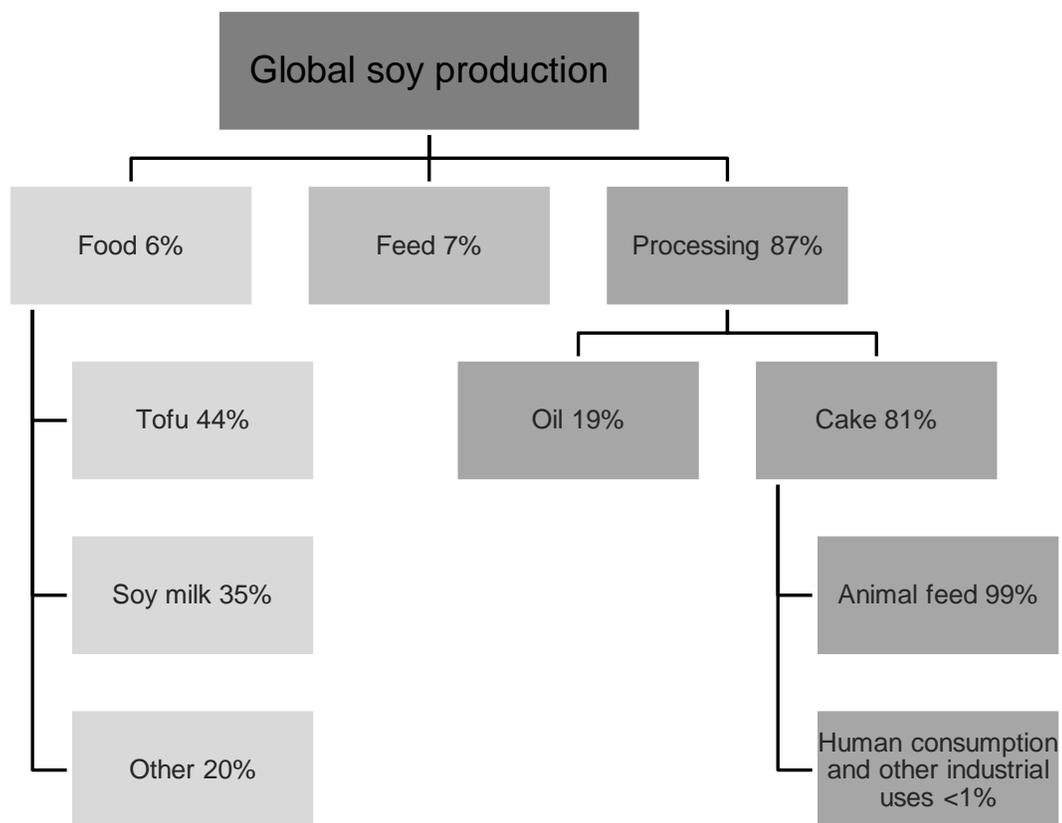


Figure 4: Snapshot soybean: why plant-based food is not the problem (adapted from Statista, 2020a, p. 39).

Furthermore, Jeske et al. (2018) contend that 80% of the total amount of almonds is being produced in California in the U.S. Since almond production requires large amounts of water, this is deemed to be problematic, especially since California has suffered from water drought for several years. However, on a general level, cow milk production still requires the highest amounts of water when compared to milk produced from almonds, rice, oat and soy (Statista, 2020a, p. 37). Scholars, therefore, contend that an increased use of plant protein is required in order to “...reduce the strain that intensive animal husbandry poses to the environment” (Day, 2013, p. 25). Consequently, plant-based dairy alternatives are considered to be more sustainable than their animal-based counterparts (Pimentel & Pimentel, 2003; Sonesson, et al. 2010; Nijdam et al. 2012; González et al. 2012; Day, 2013; Röös et al. 2018). Though, as seen from the data presented above, it can be quite complicated to draw general conclusions, which most likely will affect consumers' perceptions.

5.2.3 Health

Health represents the other side of the coin of animal welfare and sustainability. When it comes to organic food, it is not only associated with more animal-friendly farming practices but also healthy eating habits, as consumers believe organic food to be less altered during production and that it has a higher quality (Statista, 2020a, p. 15). Such associations can be strengthened by approval from authorities. For instance, soy received an approved health claim for lowering the risk of coronary heart disease by the U.S. Food and Drug Administration (FDA) in 1999. Between 2000 and 2007, more than 2700 new soy products were launched (Patisaul & Jefferson, 2010).

However, since plant-based dairy alternatives can be made from a wide variety of different plant materials, different alternatives can vary greatly in regard to actual nutrients. Hence, plant-based dairy alternatives are rather inconsistent in their performance. In contrast to cow's milk, in which the protein contents have been shown to vary between 3.15–3.37g 100 mL⁻¹, plant-based alternatives can vary between 0.28–3.16g 100 mL⁻¹ (Chalupa-Krebzdak et al. 2018). Though, as many plant-based beverages are fortified with vitamins, protein, and minerals (Sethi, Tyagi & Anurag, 2017) they can actually have equal or greater quantities of calcium and vitamin D in comparison to cow's milk (Singhal, Baker, & Baker, 2017).

Still, the differing nutritional performance is deemed to be an issue, why some scholars recommend consumers to not think of plant-based dairy alternatives as complete nutritional substitutes to products based on cow-milk (Chalupa-Krebzdak et al. 2018). Nevertheless, Danone (2018, p. 20) states that they have "... capitalized on increased consumer interest in plant-based offerings, probiotics, organic, high protein and reduced sugar options." As can be seen, this interest is in many ways related to the notion of health and healthy living.

5.3 Industry-level Factors

5.3.1 Technology and Production

Over its long lifetime, the dairy industry has been developed in several instances³. Some of the more profound changes have happened during recent decades, especially in the developed world (Barkema et al. 2015). These advancements have resulted in a dairy industry that is characterized by large firms and high-efficiency models (Doughrate, Stallones, Kolstrup, Nonnenmann, Pinzke, Hagevoort, Lundqvist, Jakob, Xiang, Xue, Jarvie, McCurdy, Reed, & Lower, 2013).

According to Kapelko & Lansink (2013), there is a relationship between technical efficiency and firm size, as they contend that dairy processing has become more efficient since the dairy processing firms have grown larger. Adams, Maluf, Meilhac, Ramirez, and de Paula (2019) further highlights this by explaining that the focus of the traditional dairy industry has been on cost efficiencies and scale, which major dairy incumbents have directed focus and resources towards.

In 2017, Danone launched the cost-efficiency program “protein” with the aim of making savings that could be reinvested into growth projects. One year later, they reported that cash flow was freed up by more than 7% (Danone, 2018, p. 13). In 2018, Arla introduced their cost-efficiency program called “calcium”, which aimed to streamline several “...activities throughout Arla, from further improving marketing efficiency to supply chain productivity initiatives...” (Arla Foods, 2017, p. 23). One year later, in 2019, Arla reported that the programme had saved them €110 million.

Such activities further emphasize the maturity of the dairy industry. Dairy incumbents believe that manufacturing efficiencies are a major source of competitive advantage, although the impact of efficiency gains on operations has been reduced due to the industry’s long lifetime (Adams et al. 2019). A major reason for this might be that the link between profitability and efficiency becomes even stronger during maturity (Anderson & Zeithaml, 1984). This indicates that dairy incumbents have focused on incrementally improving the operational aspect of their business models for a long period of time.

³ As explained in chapter 2, developments have been made in many stages of the dairy industry value chain. However, this section mainly deals with advancements in the processing stage, in which the end-products are being produced.

Since the operational part of a firm's business model includes the processes, activities, structures, as well as the linkages between them (e.g. Johnson et al. 2008; Zott & Amit, 2012; Spieth et al. 2014) established dairy incumbents seem to have essentially been doing what they always have done, but in larger quantities, and in better, faster and cheaper ways. This can, on the one hand, be done through evolutionary business model innovation, which refers to incrementally fine-tuning individual elements of the business model on a continuous basis (Demil & Lecocq, 2010; Foss & Saebi, 2017; Ramdani et al. 2019). But can, on the other hand, also be achieved through adaptive business model innovation, which emphasizes the adjustment of the overall architecture of the business model rather than replacing single elements of it (Zott & Amit, 2012; Schneider & Spieth, 2013). This further highlights the importance which incremental types of business model innovation can have (Zott & Amit, 2012)

Though, dairy incumbents have not solely focused on cost efficiencies and increased scale. Product innovation is named the second-highest ranked source of competitive advantage according to international dairy incumbents (Adams et al. 2019). This also seems to be a general characteristic for mature industries, as product differentiation and market dominance become even more critical during maturity (Anderson & Zeithaml, 1984). However, the product innovation – at least until recent years – has mainly focused on incremental changes such as new brands, flavors and modified products. This can for example be illustrated through the number of brands that Arla (30), Danone (9 dairy and plant-based) and Kavli (12) have in their product portfolios (Arla, n.d.d; Danone, n.d.d.; Kavli, n.d.c) which targets different customer segments and markets.

Similar to the business model innovation needed for improving cost-efficiency and to scale up production, the above-mentioned product developments might either already fit with firms' existing competencies and business models (Pisano, 2015) or can be achieved through evolutionary and/or adaptive business model innovation. Because although product innovations have led to new flavors and types of yogurts and cheese, for example, it is still animal-based milk that is being processed in different ways.

In contrast, the introduction and growth of plant-based dairy alternatives illustrate a more radical change within the dairy industry. In 2006, the global animal-based milk market was 14.3 times

larger than the dairy alternatives market, whereas in 2016 it was only 6.5 times larger (Wood, 2017, cited in Rööös et al. 2018). This development is expected to continue, and thus poses both opportunities and threats for dairy incumbents. However, plant-based dairy alternatives differ from animal-based dairy products in their overall production (Jeske et al. 2018); nutritional profiles (Bridges, 2018; Chalupa-Krebzdak, et al. 2018); environmental impact (Mäkinen et al. 2016; Rööös, Patel & Spångberg, 2016; Jeske et al. 2018) as well as taste and texture (Bridges, 2018; Silva, Silva & Ribiero, 2020).

Consequently, the production of plant-based dairy alternatives might be difficult, if not impossible, to incorporate through evolutionary and adaptive types of business model innovation. Instead, more radical transformations seem to be needed, perhaps through secondary business model innovation. Such changes will require large investments as the resources and processes are drastically different from those needed to produce animal-based dairy:

.... it is a completely different process of producing plant-based dairy alternatives in comparison to traditional dairy products ... you have more processing steps, which requires much larger investments ... and as a large multi-organization [Raisio]⁴ a lot of focus is put on short-term results – in my opinion – so you must deliver results (Interview, 29 April 2021).

Hence, having the financial strength to invest in the needed equipment, or perhaps acquiring firms that already have the resources and processes needed for production in place, might be a requirement for these types of business model innovation. As the dairy industry consists of many well-established and large players that are already making large investments in production facilities and equipment (see table 2), this might not be an issue from a financial standpoint. On the other hand, as also highlighted in the quote above, major incumbent firms might be reluctant towards carrying out radical types of business model innovation due to the strong focus on profitability, and perhaps short-term profitability, which has been underscored through the focus on cost-efficiency, scale, and incremental improvements.

⁴ Kavli acquired their plant-based production facilities from Raisio.

Table 2: Arla, Danone, and O. Kavli’s capital invested in property, plant, and equipment between the period of 2015–2019 (numbers collected from annual reports)

Year	Capital invested in property, plant, and equipment	Assets: Property, plant, and equipment
Arla		
2015	€ 350m	€ 2457m
2016	€ 263m	€ 2310m
2017	€ 248m	€ 2212m
2018	€ 383m	€ 2308m
2019	€ 425m	€ 2710m
Danone⁵		
2015	€ 170m	€ 4752m
2016	€ 282m	€ 5036m
2017	€ 969m	€ 6005m
2018	€ 170m	€ 6175m
2019	€ 669m	€ 6844m
O. Kavli		
2015	SEK 31m	SEK 222m
2016	SEK 17.6m	SEK 215m
2017	SEK 18m	SEK 208m
2018	SEK 10m	SEK 204m
2019	SEK 54m	SEK 235m

⁵ Danone’s “capital invested in property, plant and equipment” have been calculated from the annual increases in their asset base, i.e. the numbers in the column to the right. This might give a skewed understanding due to factors such as depreciation.

Furthermore, already having established business models with capital-intensive production sites, equipment, and value chains, might indicate strategic inflexibility. Since the notion of strategic flexibility deals with the flexible use of resources and reconfiguration of processes (Miroshnychenko et al. 2021), this might certainly hold true when comparing the resources and processes needed for animal- and plant-based dairy production. Therefore, secondary business model innovation could be the most viable option for dairy industry incumbents aiming to move into the sphere of plant-based or other types of products that are radically different from animal-based dairy in terms of production. Though, it is still important that the incumbent business model does not prevent the new business model from succeeding (Johnson et al. 2008).

In order to understand the differences between the different types of technologies and processes that are needed to process animal-based dairy on the one hand, and plant-based dairy on the other hand, an overview of the respective production processes is presented followingly. Though, it is important to note that changes also can happen in other parts of the value chain. For instance, it seems like Arla will use its owner-farmers as key suppliers for the main raw materials for plant-based dairy production as well. This was hinted at by Arla's managing director of the UK, Ash Amirahmadi, who states that the launch of Jörd will be a business opportunity for the owner-farmers (Arla, 2020b). Hence, the ownership structure of Arla can be a key moderator and/or driver for business model innovation, as the dairy farmers are also the owners through the cooperative.

5.3.1.1 Processing Technology

The processing of milk consists of several stages. In figure 5 below, Burke, Zacharski, Southern, Hogan, Ryan and Adley (2018, p. 7) presents a general overview of these stages, which differ depending on what type of dairy product that is being produced. It is partially this process that has been incrementally developed and hence made more efficient and cost-effective, as described above.

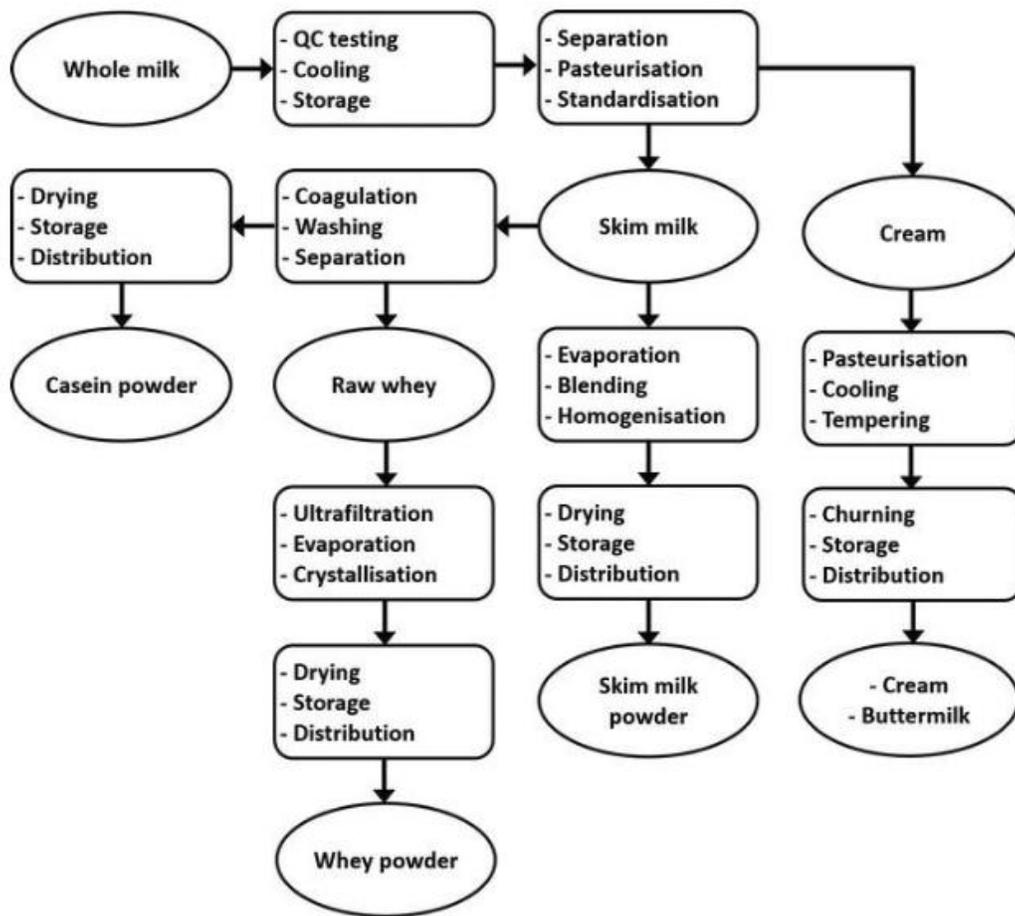


Figure 5: Milk processing stages (Burke et al. 2018, p. 7).

Plant-based dairy alternatives are to a large extent imitations of traditional animal-based dairy products, and hence include everything from milk, butter, cream, yogurt and ice cream (Ganeshram, 2021). Thus, they are imitations or alternatives to the products being produced in figure 5. The production of these plant-based products can vary, but to present a comprehension

of a general production process, the example of plant-based milk is chosen. “Plant-based milk substitutes are essentially suspensions of dissolved and disintegrated plant material and extracts in water” (Bridges, 2018, p. 20). This “plant material” can consist of a range of different grains, pulses, and nuts, and can be classified into five different categories, as shown in table 3 (Sethi et al. 2017).

Table 3: Categories and examples of plant-materials used to produce plant-based dairy alternatives

Category	Examples
Cereal	Oat, Rice, Corn & Spelt
Legume-based	Soy, Peanut, Lupin & Cowpea
Nut-based	Almond, Coconut, Hazelnut, Pistachio & Walnut
Seed-based	Sesame, Flax, Hemp & Sunflower
Pseudo-cereal-based	Quinoa, Teff & Amaranth

These plant materials can either be prepared by dry-milling the plant to a flour, or wet-milling it to extract a liquid. Furthermore, depending on the product that is being produced, “...standardization and/or addition of other ingredients, such as sugar, oil, flavorings, and stabilizers, may take place, followed by homogenization and pasteurization/ultra-high temperature (UHT) treatment to improve suspension and microbial stabilities.” (Mäkinen et al. 2016, p. 340–341). This process is illustrated in figure 6.

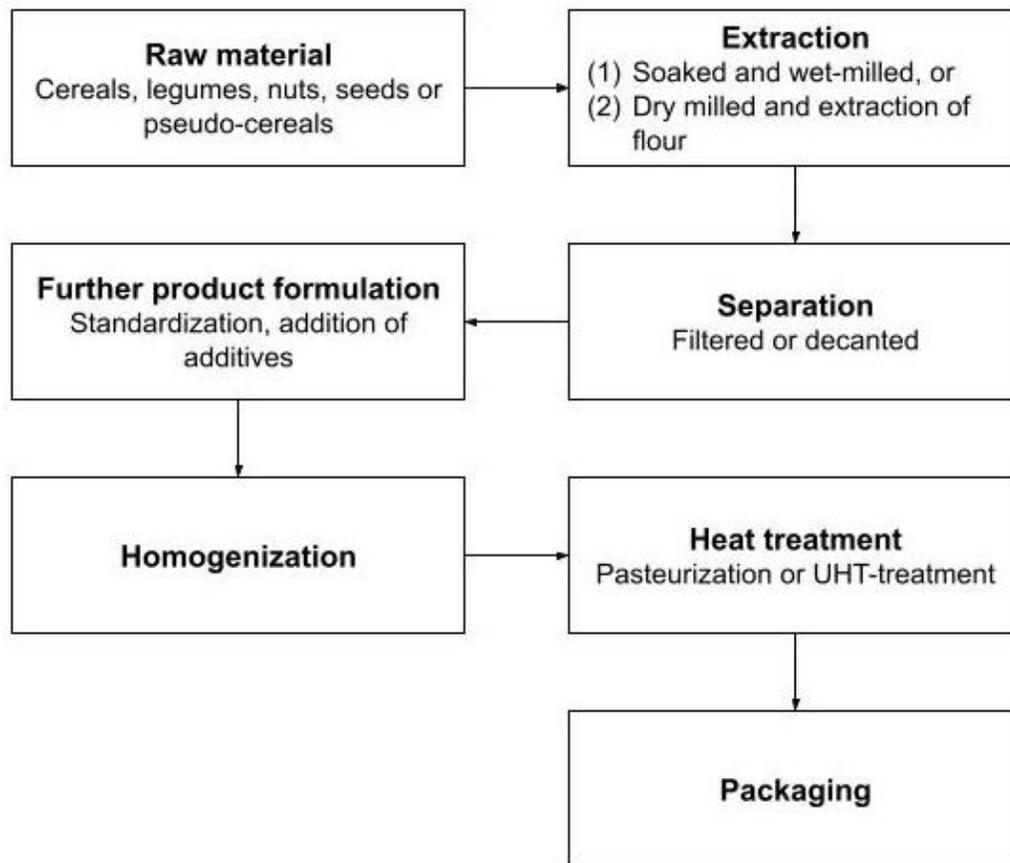


Figure 6: General manufacturing steps for the production of plant-based milk substitutes (adapted from Jeske et al. 2018, p. 43).

In contrast to animal-based dairy processing, industrial plant-based dairy production has not been developed over the same duration of time. Hence, the production processes of plant-based dairy alternatives have seemingly a lot of room for improvement. Not only in regard to efficiency gains, but also when it comes to nutritional value, taste, and texture.

As can be seen in figure 6, heat treatment is a common stage in the processing of plant-based materials. This treatment is currently necessary but can reduce the digestibility of the protein contents of the end products (Munekata, Domínguez, Budaraju, Roselló-Soto, Barba, Mallikarjunan, Roohinejad & Lorenzo, 2020). However, several new and advanced food processing technologies are being developed that hold great potential for producing more nutritionally balanced products. Tangyu et al. (2019) further contend that fermentation holds great

potential for the future and expects well-balanced and naturally fermented plant-based milk alternatives in the coming years. Fermentation also holds potential for improving the taste and texture of plant-based dairy alternatives. In other words, “plant-based beverages will continue to be a major research area in the newer product development category of food science and technology” (Munekata et al. 2020, p. 12), highlighting the future potential of plant-based dairy production.

5.3.2 Consumer Preferences and Needs

The number of consumers that are choosing plant-based dairy alternatives instead of animal-based dairy products is growing. This choice can be based on both preferences and needs, and include factors such as cow milk allergy, lactose intolerance, sustainability, and health concerns, as well as lifestyle choices such as veganism (Mäkinen, et al. 2016; Sethi et al. 2017; Chalupa-Krebzdak et al. 2018; Schiano, et al. 2020). Hence, plant-based dairy alternatives seem to be able to get several different “jobs” done – which according to Johnson et al. (2008) refers to a solution to a customer's problem in a given situation. This is further highlighted by Christensen, Anthony, Berstell, and Nitterhouse (2007) who explain that customers “hire” products and services to do the job that needs to be done.

In regard to the needs of consuming plant-based dairy alternatives, it is noteworthy that Europe and North America constitute two of the regions in the world with the lowest frequency of lactose intolerance, in contrast to Asia where the prevalence can be up to 100% in some countries (Lomer et al. 2008). Still, the market is growing rapidly, highlighting the fact that a majority of consumers choose plant-based dairy alternatives out of preference rather than necessity (Silva et al. 2020). Additionally, more than half the consumers of animal-based dairy in the U.S. are also purchasing plant-based dairy alternatives (McCarthy et al. 2017). This indicates that companies in the dairy industry can fulfill the needs of the same customers with different business models (Peric et al. 2017). It also indicates that the customer value proposition for animal-based dairy products and its plant-based alternatives can be the same:

The most important thing for us was – because we did a quite extensive analysis of the market – to look at the product quality. Because if we are getting ourselves into something, the most important thing for us is that the product can speak for itself, without needing the assistance of arguing for and against something, like Oatly. That’s their way of marketing themselves, but not ours. We can’t do that; I mean we also have traditional dairy products. We don’t want to be there. We want the product to be as good that a traditional consumer of dairy products feels that ‘damn, this is at least as good as the other [animal-based dairy], I want this instead!’ instead of focusing on consumers that must consume it [plant-based] because of their diets and such. ... (Interview, 29 April 2021).

From the quote above, a key aspect of Kavli’s customer value proposition is product quality. They want all their products, whether animal- or plant-based, to uphold a level of quality and taste that is alluring to everyone, despite medical reasons. In this sense, plant-based dairy alternatives should not be seen as a substitute to their animal-based dairy products, but rather an alternative that will get the same “job” done. One reason for this seems to be that they do not want, and cannot be, in a position where the “job” to be done includes the argumentation for or against certain products, like Oatly – the Swedish oat-based dairy producer – is doing⁶. This is further manifested on Planti’s website, where they state that “our creamy and tasty products are fully plant-based and work in the same way as dairy products. Same same but plant-based as we like to say” (Planti, online, n.p.b). Arla takes a similar approach to the plant-based alternatives as Kavli does with Planti. Vadmin Smolenkin, Arla’s senior innovation manager, underscored this by explaining that “at Arla we produce products for everyone, dairy and non-dairy, to enjoy side by side.” (NS Packaging, 2020, n.p.). In contrast, Danone, with their plant-based brand Alpro, emphasizes the sustainability aspect:

We’re on a plant-based mission because we believe the world’s a great place. And we’d like to keep it that way. We’re leading the change in our One Planet Thinking, which means looking at great things. Plus plant-based foods are better for the planet because they use less natural resources (Alpro, online, n.p.).

Hence, although they offer both animal- and plant-based products, they state that their plant-based alternatives are more environmentally friendly. A reason for this might be that they already have

⁶ Critique against animal-based dairy products is a recurring element in Oatly’s communication (e.g., Oatly, n.d.).

an internationally developed plant-based business that keeps growing: “Our plant-based business demonstrated strong growth, performing particularly well in Europe, where Alpro grew double digit, in line with our ambitions to triple our plant-based business by 2025.” (Danone, 2019, p. 23). From a consumer perspective, however, it can be rather difficult to make sustainability judgments about different types of dairy products. Consumers are in fact making such judgments largely by reading product labels at the point of purchase, while still not fully understanding the claims that are being made (Schiano et al. 2020). Perceptions are also important in this regard. Some consumers perceive animal-based products to be unfriendly for both the animals and the environment (Clay et al. 2020). As earlier explained, such perceptions may or may not be in harmony with the actual production of the products that are being purchased, but are nevertheless contended to be strong as a majority of consumers are willing to spend up to 20% more for products that are sustainable and healthy (Pieters, McMahon, Schunck & Kroef, 2017). As mentioned before, the major nutritional differences between plant-based brands and product types make it difficult to make judgments regarding the health aspect as well.

Sustainability and nutritional content are in other words important factors for consumers. However, consumers within the EU also say that food origin, cost, food safety, and taste are of high importance (Statista, 2020a, p. 24). Arla seems to have embraced many of these aspects when developing their plant-based dairy alternatives. This is explained by Vadmin Smolenkin, Arla’s senior innovation manager:

We have used only a handful of ingredients, and no ‘nasties’. We make all three drinks with only organic and Nordic ingredients. Jörd Oat is a pure oat drink with a fresh and pure taste of Nordic oats. Jörd Hemp balances oats with the nuttiness of sustainable and healthy hemp and Jörd Barley adds the sweetness of barley and brings a rediscovering of old ancient Nordic cuisine ... (NS Packaging, 2020, n.p.).

This further highlights the range of different possible customer value propositions that both animal- and plant-based dairy alternatives might comprise, ranging from everything between taste, texture, nutritional value, and sustainability, and build upon both perceptions and concrete information. In other words, animal- and plant-based products can get several “jobs” done.

5.3.3 Industry Pace and Stability

One way of determining the pace of an industry is by looking at the industry clockspeed, which refers to three facets of speed in which an industry changes (Fine, 1998; Nadkarni & Narayanan, 2007). Hence, the clockspeed of an industry affects the difficulty incumbent firms may have to create competitive advantages (Fine, 1998). However, it is not only the rate of change that affects a firm's performance, but also the characteristics of the changes. The following section will therefore investigate both the pace and the stability⁷ of the dairy industry.

According to Fine (1998), the first facet of industry clockspeed deals with the number and speed of new product launches. Since the dairy industry has been contented to be mature – partly due to its long existence and partly due to it being characterized by a supply that is growing faster than the demand – a lot of focus has been directed towards product differentiation strategies (Adams et al. 2019). However, although large and small dairy incumbents have been launching new brands and products (Adams et al. 2019), such launches have largely been characterized by incremental developments and changes to already existing products. Dairy products have been produced and consumed for thousands of years (Copley et al. 2005; Abou-Donia, 2008) which highlights the limited room for producing radically different animal-based dairy products. Hence, although the speed and number of new product launches can be contented to be quite rapid and high, it seems to have been characterized by stability rather than volatility. In this sense, only minor adjustments to the business models of dairy industry incumbents might have been needed as gradual shifts in consumer preferences and competition have occurred over time (Gibe & Kalling, 2019). The increased emphasis on nutrition and health can for instance be linked to the launch and extension of Arla's protein segment (Arla Foods, 2016, p. 17; Arla Foods. 2017, p. 27). However, such products are not radically different and have therefore not been disrupting the dairy industry.

In contrast, plant-based dairy alternatives are profoundly different products that require different processes and resources in comparison to animal-based dairy production. The speed and number of such product launches have also been quite rapid and high. For instance, the global compound

⁷ The dairy industry can be rather volatile in terms of milk prices. However, this instability is mainly concerned with the dairy farmers as it affects their predictability in terms of revenue streams (Arla Foods, 2016, p. 49; Danone, 2015a, p. 62–63).

annual growth rate (CAGR)⁸ of the dairy industry (Parmalat, 2018), between the period of 2012 and 2017, was 1.2% (0.4% for Eastern Europe, -0.5% for western Europe, and -0.6% for North America). In contrast, it was 65.1% for non-dairy cheese, 50.2% for spoonable non-dairy yogurt, and 14.1% for dairy alternative drinks, between the period of 2014 and 2018 (IFT, 2019). Moreover, there is a lot happening in the sphere of plant-based dairy and new products can hence be expected in the future (Munekata et al. 2020).

The second facet of the industry clockspeed deals with the rates at which process technologies are replaced in an industry (Fine, 1998). In the dairy industry, this facet seems to be tightly related to the product facet. Just like the development of animal-based dairy products, the production and technologies of the dairy industry have been characterized by incremental change and development, both when it comes to the farmers and the processors, as explained in earlier sections. However, dairy incumbents still believe manufacturing efficiencies to be a great source of competitive advantage (Adams et al. 2019), which can be one reason for the relatively large investments that have been made in property, plant and equipment (see table 2). Though, the characteristics of many of those investments have been of an incremental kind, as they refer to manufacturing efficiencies of existing resources and processes (see Appendix B). In this sense, the replacement and development of technologies have been rapid but nevertheless characterized by stability as they have not disrupted the industry. This indicates that evolutionary and adaptive business model innovation have been recurring forms of business model innovation for dairy industry incumbents.

However, as the market for plant-based dairy alternatives has kept growing, novel process technologies have also been introduced. These technologies are further expected to be developed in the years to come (Tangyu et al. 2019; Munekata et al. 2020), which might mean that current process technologies of plant-based dairy products can be obsolete in just a few years. In other words, dairy incumbents may be presented with both opportunities and threats related to radical improvements and technological innovations in the plant-based segment. Therefore, as the technologies that are needed to produce plant-based dairy alternatives require more radical forms

⁸ Refers to the annualized average rate of revenue growth and is limited to animal-based dairy products only.

of business model innovation, or perhaps secondary/parallel business model innovation, such investments might pose a risk as it cannot be assessed with certainty how profitable and long-lasting the investments will be. This further highlights what Gibe and Kalling (2019) explains to be the most difficult task for any strategist – to know when the timing is right.

The third facet of the industry clockspeed relates to strategic activities and internal organizational capabilities (Fine, 1998; Nadkarni & Narayanan, 2007). One important strategic activity that has characterized the dairy industry is the mergers and acquisitions of both dairy farms and processors, leading to a smaller number of large incumbent firms. Danone, for instance, acquired WhiteWave in 2017, which allowed them to grow rapidly in many health-focused categories, including organic, non-GMO, and plant-based products (Danone, 2017). Arla and Kavli have also acquired other companies and production plants. For instance, Arla acquired a production plant in Bahrain, as well as Yeo Valley Dairies, in 2019 (Arla Foods, 2018, 2019) and Kavli acquired the production plants where Planti is produced in 2013 (Interview, 29 April 2021). In this regard, the industry clockspeed can be deemed to be quite fast. However, it is also important to look at the details of such activities as they can require different types of business model innovation. When another firm is being acquired, with a business model that is drastically different from that of the acquirer, secondary or parallel business model seems to be a viable option:

We choose to keep them [the business models] separate. This has been discussed a lot. However, we have also agreed to keep a common category for plant-based in the corporation, which we don't have with anything else. Soft cheese, for example, we are producing in Sweden, with an own market in Sweden. Equivalent to this, we have a production site in Norway with their own organization, and the same thing in the UK. (Interview, 29 April 2021).

From the quote, we can observe that Kavli has chosen to keep the business model of their plant-based operations separate from their animal-based ones. This is deemed to be reasonable for two reasons, the first one being that they acquired the production facilities and operations where their plant-based products are being produced. The second reason is that secondary/parallel business model innovation might be a way of not risking any interference with their primary business model.

It is very important to make sure that the incumbent business does not prevent the new business model from succeeding and vice versa (Johnson et al. 2008).

Furthermore, when it comes to internal organizational capabilities, strategic flexibility is important (Nadkarni & Narayanan, 2007). Strategic flexibility deals with the flexible use of resources and reconfiguration of processes (Miroshnychenko et al. 2021) which can be deemed quite problematic for dairy incumbents that want to get into the business of plant-based dairy alternatives. As can be seen in table 2, the asset base of dairy industry incumbents is quite large and are also specific to the production of animal-based dairy products (see section 5.3.1.1). Hence, they can be deemed to be rather inflexible from a strategic standpoint, which further highlights the viability of secondary/parallel business model innovation.

To sum up, the speed of the dairy industry is rather fast. However, the characteristics of the activities and changes that have been happening at a fast pace seem to have been characterized by incremental changes. At least until recently when the growth of the plant-based dairy segment has taken off. This indicates that a tipping point has occurred.

5.3.4 Value Migration

In earlier sections, it has been stated that plant-based dairy alternatives are growing while some traditional animal-based dairy products, in some markets, are declining. It has also been stated that many consumers choose plant-based dairy out of preference and that up to 50% of animal-based dairy consumers also purchase plant-based alternatives (McCarthy et al. 2017). Hence, value seems to be migrating from animal-based dairy products to plant-based dairy alternatives, indicating a change of value-creating forces in the dairy industry. Consequently, several dairy industry incumbents have already launched their own versions of plant-based dairy alternatives, and hence made adjustments to their business models and/or launched parallel ones. Kavli has done it with the brand of Planti; Arla with the umbrella brand of Jörd; Danone with several brands, such as Alpro.

In a business environment where value is migrating from one kind of product to another, incumbents may run distinct business models to deliver differentiated value propositions and to develop new revenue streams, as suggested by Casadesus-Masanell and Tarzijan (2012). However, by doing this the firms remain at the risk of failing to exploit synergies between business models for different products (Markides, 2013; Markides & Oyon, 2010). To mitigate the potential disadvantages of keeping two business models separately, Markides (2013) explains that some value chain activities can be shared. This is perhaps what Arla intends to do, as they seemingly aim to use their dairy farmers as key suppliers for their plant-based dairy production as well (Arla, 2020b).

Furthermore, incumbent firms can also deal with the issue of value migration by understanding the nature and degree of it. In this sense, business model innovation efforts can be aligned with the observed degrees of value migration. From the developments described in previous sections, value migration seems to have existed in the dairy industry already before the introduction and growth of plant-based dairy alternatives. However, as the industry was characterized by gradual changes and incremental improvements, value did not seem to move from old and established business models to drastically different ones, but rather from lagging business models to more fine-tuned ones that better captured consumer preferences and needs while simultaneously capturing as much of the generated value as possible. These are improvements that can be attained through incremental types of business model innovation, which dairy incumbents seem to have focused on for a relatively long period of time. During this period, the degree of value migration can hence be characterized as low, which is illustrated by the revenue development of the dairy products of Arla and Danone in Figures 7 and 8.

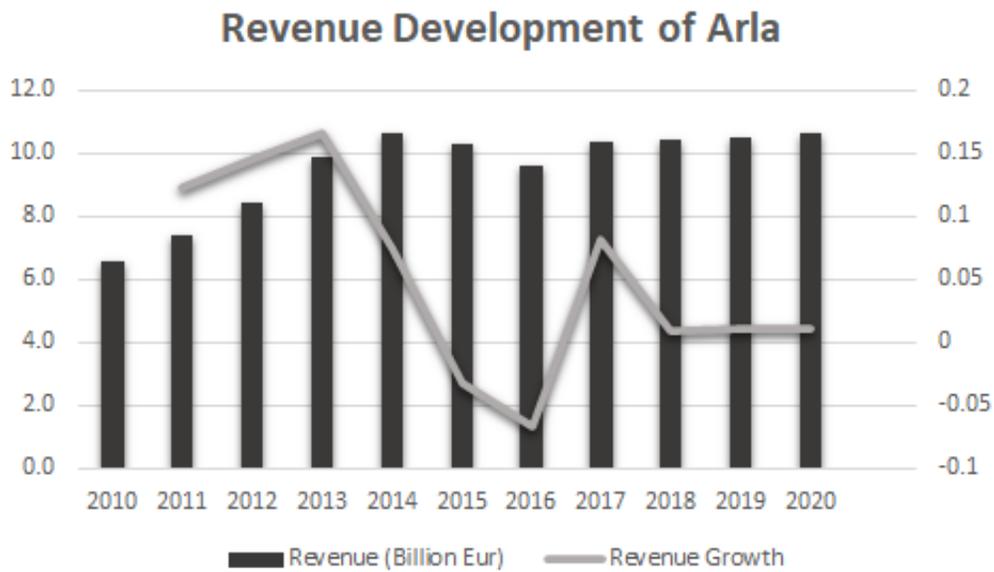


Figure 7: Revenue development of Arla between 2010 and 2020 (Arla Foods, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020).

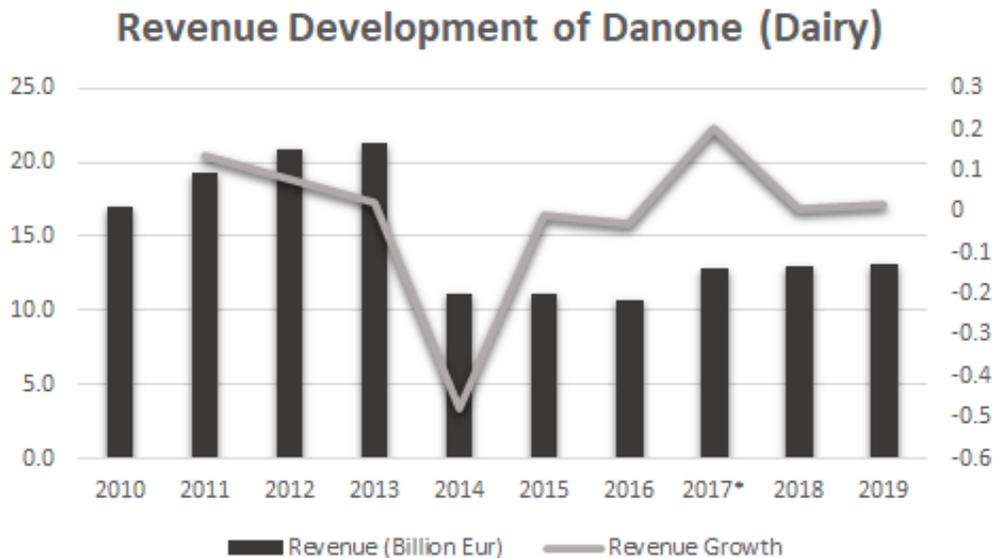


Figure 8: Revenue development of Danone⁹ (dairy) between 2010 and 2019 (Danone, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019).

⁹ In 2017, Danone introduced plant-based products and started reporting both together as an Essential Dairy and plant-based category hence, a sharp increase in growth.

As illustrated in the figures above, there was a significant decline in the revenue growth of both Arla and Danone during the period between 2013–2015, and 2013–2014. Simultaneously, the growth of plant-based dairy alternatives seemingly took off. As mentioned earlier, the global milk market was 14.3 times larger than the dairy alternatives market in 2006, but only 6.5 times larger in 2016 (Wood, 2017, cited in Rööös et al. 2018). This is further illustrated by the rapid pace of growth in the sales of plant-based dairy alternatives around the world (e.g., HKExnews, 2015; FoodPersonality, 2019). Hence, this time period seems to illustrate a tipping point, before which the value migration was low, but after which a higher degree of value began to migrate, especially from animal-based dairy products to plant-based dairy alternatives.

To remain competitive and to achieve a value inflow, it is important to have a strategy for business model innovation that fits with the existing degree of value migration in the industry (Hacklin et al. 2018). In environments with lower degrees of value migration, the existing business model of a firm is not under threat. It is therefore possible for incumbent firms to launch parallel business models without making any changes that potentially could corrupt the primary business model (Hackling et al. 2018). However, according to our observations, it rather seems that dairy industry incumbents focused on incremental and parallel kinds of business model innovation when the degree of value migration was low. Though, as mentioned earlier, these changes were primarily directed towards cost-effectiveness and product differentiation, rather than towards creating new revenue streams from radically different products. At least up until the tipping point that seems to have been caused by the growth of plant-based dairy alternatives, after which traditional dairy industry incumbents seem more likely to move into the sphere of plant-based dairy alternatives.

After this tipping point, there are some indications of secondary/parallel business model innovation in the dairy industry. As mentioned earlier, Kavli acquired the production facilities where they produce Planti, and they also keep that segment separate from their other categories. Furthermore, Arla launched their plant-based products in 2020, but there is no reference of it in their annual report for the year 2020, which may indicate that Arla has kept their plant-based business model separate from their other categories. Additionally, Hane Søndergaard – vice president of marketing and innovation at Arla – states that, “Milk will always be at the heart of Arla’s business. However, plant-based products are adjacent to the company’s existing product portfolio” (Arla, 2020a, n.p.).

Though, this cannot be said with certainty as Arla's managing director of the UK, Ash Amirahmadi, hints at using the same owner-farmers as key suppliers for the main raw materials of their plant-based production (Arla, 2020b, n.p.). Arla has also made significant investments in talent, technology and resources for the plant-based alternatives but there is no clear indication whether they have pivoted their existing business model to integrate new activities, or if they have introduced a separate business model parallel to the existing one. Moreover, Danone has kept its business models separate for different product categories like dairy, water and food, but it is not certain whether different business models are being used within the dairy section. Danone is in fact reporting for both animal- and plant-based products together under the *Essential dairy and plant-based product* category in their annual reports (e.g. Danone, 2017, 2018, 2019).

5.4 Revised Framework

From the analysis, we have been able to identify three macro-level factors that seem to drive business model innovation within the dairy industry. These factors include animal welfare, sustainability, and health, and can be categorized as regulatory/political and social factors. Furthermore, the technological aspect seems to be mostly related to the dairy industry and its firms, as it is a factor that can create competitive advantages for incumbents. It seems to be especially relevant to look at the characteristics of technological development, and whether it has been incremental or radical. These observations have been added in the red boxes in our revised framework below (see figure 9).

In regard to the industry-level factors, the industry pace has been removed. The main reason for this is that the speed of an industry might be fast, but if only incremental changes are happening at a rapid pace, slight adjustments to the firm's business model might suffice. Hence, the characteristics of the changes are more relevant, which can better be determined by looking at consumers' preferences, the industry stability, and the value migration.

For the firm-level factors, the absence of primary data has made it impossible to explore the role of cognition. However, from a theoretical standpoint, it is an important factor that should further be considered. We have, on the other hand, been able to gain some insights about the strategic

flexibility and ownership structure of dairy industry incumbents. These factors are deemed important as they might drive and moderate business model innovation in several ways.

To sum up, firms' business model innovation efforts can both be driven and moderated by the above-mentioned factors. However, as consistently argued throughout this thesis, business model innovation can be carried out in many different ways. In a broad sense, these types of business model innovations can be categorized as incremental, radical, as well as secondary and/or parallel.

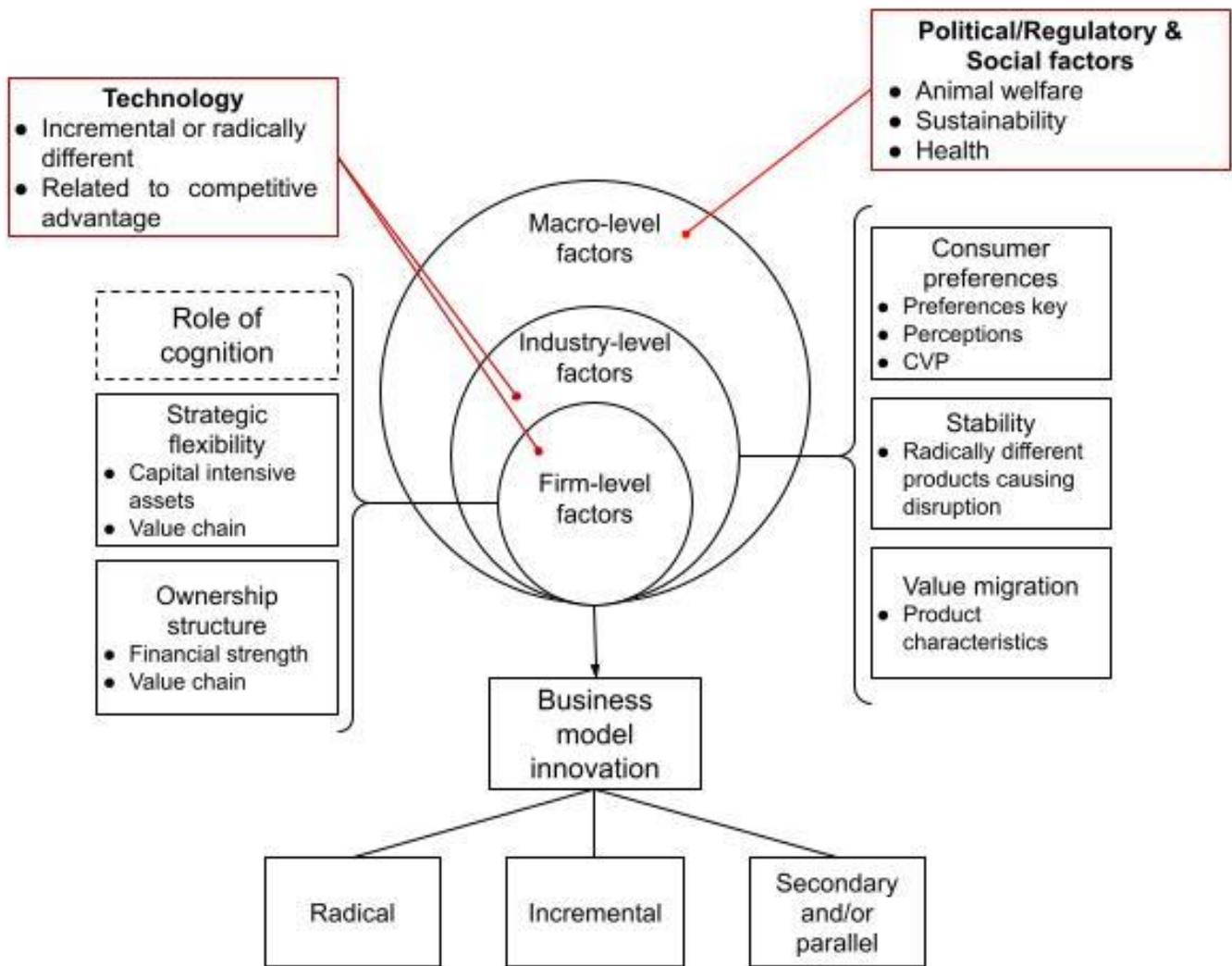


Figure 9: Revised framework on factors that can drive and moderate dairy incumbents to innovate their business models (created by authors based on analysis).

6. Discussion and Conclusions

6.1 Major Findings

Our findings indicate that animal welfare, sustainability, and health constitute influential macro-level factors that, both directly and indirectly, can drive dairy incumbents to innovate their business models. All of these factors consist of one regulatory and/or political element, and one social element, which together affect the industry as a whole in certain ways.

Regulations govern how dairy farms can and should treat their animals, but since the social concerns and interest about this issue have increased, there is also a social contract that needs to be maintained. This applies to both dairy farms and processors, as they many times are interconnected, and because consumers often make judgements based on the end-products. Likewise, sustainability also affects the dairy industry through regulation and/or politics, as well as social concerns. We have for instance observed that several incumbent firms are emphasizing sustainability in their communication. Large investments are also directed towards making their operations more sustainable (e.g. Danone, 2019). These factors seem to be in favor of the plant-based dairy alternatives, especially from a consumer-perspective, but there still exists confusion as to what sustainability really is, and what alternatives that are performing best in this regard. Generally, though, plant-based alternatives are concluded to be the more sustainable alternative. Health is the third macro-level factor, and primarily affects the dairy industry through social trends and concerns. The performance of products in regard to this factor can be assessed through several different criteria, such as protein contents, the perceived “naturalness”, and if the product is organically produced. Consequently, dairy incumbents have added several new products to their portfolios with higher amounts of protein, lower amounts of sugar, as well as non-GMO products. Similar to the factor of sustainability, it can be difficult to make assessments about a product's health-related performance. While cow milk, for instance, performs quite consistently despite type and brand, there can be great differences among plant-based dairy alternatives. Furthermore, approval from governmental authorities can also propel assessments and perceptions about health, which also can drive firms to launch new types of products.

Several of the above-mentioned factors seem to strengthen consumers' preference towards plant-based dairy alternatives. Since many consumers perceive plant-based dairy alternatives to be healthier as well as more friendly for the environment and animals, they choose plant-based instead of animal-based products. However, most people are actually consumers of both types of products, underscoring the *preference* rather than *need* of consuming plant-based dairy. This also highlights the increased competition within the dairy industry, as value not only migrates between animal-based dairy products, but from animal- to plant-based dairy products. Consequently, the degree of value migration has increased, which might drive and moderate business model innovation efforts within the dairy industry.

Since there are multiple reasons for consuming dairy products, whether they are animal- or plant-based, there are several "jobs" to be done within the dairy industry. In some cases, animal- and plant-based products can even get the same "job" done, meaning that the customer value proposition of different products can be the same. This also indicates that different business models can help consumers get the same "job" done.

While one consumer might choose Alpro's soya milk, another consumer might choose Arla's protein shakes. Despite them being two very different products, they may both help consumers "live a healthy lifestyle". However, an interesting insight is that Alpro (Danone) is also an advocate of shifting from animal- to more plant-based consumption due to sustainability reasons, while simultaneously having animal-based dairy products in their portfolio. In this sense, they are actively competing with themselves. In contrast, Arla and Kavli seem to be more cautious and rather produce plant-based alternatives that are "equal" to animal-based products and that can be consumed "side by side" with them. Nevertheless, although they are not stating it themselves, the value migration indicates that firms with both animal- and plant-based dairy products are competing with both themselves and each other.

However, while some elements of the business models can be integrated, such as the customer value proposition, other elements cannot. The production processes and technologies of animal- and plant-based dairy products are radically different, both in their nature and development. The production of animal-based dairy products has been incrementally developed for a long period of

time and at a seemingly rapid pace, and improvements have especially been made in terms of cost-effectiveness and scaled-up production. Such improvements are indicators of maturity and can be carried out through evolutionary or adaptive business model innovation. Included in these developments are also incremental product innovations, such as high-protein, and organic dairy products. This indicates that dairy incumbents have directed focus towards gaining and keeping market shares within a mature and competitive industry. Such improvements seem to have been done in an incremental rather than radical nature.

In contrast, the production processes and technologies of plant-based dairy alternatives illustrate a more radical change within the dairy industry, that requires more radical types of business model innovation, if not secondary or parallel business model innovation. The strategic inflexibility of dairy incumbents also highlights the requirements of more radical business model innovations, as production facilities, plants, and equipment needed for producing dairy are capital intensive and specific. Moreover, while the production technologies for animal-based dairy products can be contended to be mature, there is much to expect in regard to developments of plant-based production technologies in the future. This might be a reason to not enter and/or expand the plant-based segment, as large investments specific to the production of plant-based dairy are required. In other words, the risks associated with entering the plant-based segment in a relatively early stage can be a moderator for radical business model innovation within the dairy industry. This risk assessment might stem from a supposedly strong focus on short-term profitability, which is underscored by the industry's historical emphasis on cost-effectiveness and scalability.

This moderator might also be justified by the fact that the market for animal-based dairy products is still large, and that it is difficult to predict whether it will regain shares from the plant-based segment or not. Entering it, as an animal-based dairy incumbent firm, might thus lead to increased competition that could be detrimental for their own dairy business. A potential pitfall with this point of view, however, is path dependency. Because failing to adjust to changes in the external environment can ultimately lead to obsolescence (Hamel & Välikangas, 2003). For this reason, it is of crucial importance to be ready and have the capacity to change when the time has come. Nevertheless, these moderators relate to “the role of cognition” to a large extent, which we have not been able to explore empirically due to the nature of our collected data.

Furthermore, ownership structure can also be a moderator and driver for business model innovation in the dairy industry. While large corporations can acquire established plant-based dairy businesses through their financial strength, like Danone did with WhiteWave in 2017, smaller incumbent firms might have a harder time. Additionally, dairy incumbents like Arla might have been reluctant to move into the plant-based dairy segment due to the cooperative structure of the firm. The dairy farmers might, quite naturally, have several reasons for being against the decision to move into this segment. On the other hand, this also presents Arla with the possibility of creating synergies, as their existing farms can gradually begin to grow crops (i.e. plant-materials) while simultaneously keeping their animal-based dairy business intact. However, some aspects of the ownership structure are also related to “the role of cognition”, such as decision making. Public companies might for instance be more driven by short-term profitability than privately owned companies. Though, as mentioned above, we have not been able to explore such factors due to the limitations of the collected data.

6.2 Similar Movements

The automotive and meat industries represent two adjacent industries that in several ways are moving in a similar direction as the dairy industry. Connecting our analysis and discussion about the dairy industry with these “movements” therefore presents an opportunity to relate our findings to different contexts, but also to gain further insights about the dairy industry.

The automotive industry, similar to both the dairy and meat industries, has for a long time focused on incrementally optimizing production and logistics (Athanasopoulou, de Reuver, Nikou & Bouwman, 2020). Hence, mature technologies, relatively unchanging customer needs and established business models have been typical characteristics for the last decades of the automotive industry (Brandtner & Freudenthaler-Mayrhofer, 2020). However, drastic changes have been, and are affecting the industry in several ways, forcing players within the industry to make changes to their business models.

Similar to the dairy and meat industries, and the global food systems in general, the automotive industry is contended to be a major polluter. Several countries around the world have therefore

begun to enact strict emissions controls on new vehicle models, which have driven many automotive incumbents to move into the electric mobility sector (Wagner, 2021). Although there are regulations that govern the dairy and meat industries in regard to sustainability, the automotive industry is ahead, partly due to the regulatory factor stemming from the macro-environment. This makes questions arise whether, or perhaps when, stricter regulations will be enacted in favour of plant-based dairy and meat alternatives.

Technology paradigms and technological innovations have further caused automotive firms to rethink their business models (Gao, Kaas, Mohr & Wee, 2016). Additionally, there is also a shift towards mobility services, which further disrupts the automotive industry (Ferrero, Perboli, Rosano & Vesco, 2018). As a consequence, the boundaries of the industry have changed, as it also includes mobility service providers (Stanley & Gyimesi, 2015). Hence, a key competitive advantage for automotive incumbent firms is resilience, in order to continuously strike a balance between existing practices and new opportunities and threats (Gao et al. 2016; Svahn et al. 2017). Relating this to the dairy industry – as value have started to migrate from animal- to plant-based dairy products – it seems important for dairy incumbents to balance between their existing businesses with the growth of newer, more radical, segments. The importance of this might also extend to the potential increase of lab-based dairy alternatives in the future.

The same goes for the meat industry, as it is seeing a double-digit growth in the plant-based meat segment. Between the period of 2012 and 2025, meat sales are estimated to increase at a CAGR of 1.4% in Europe and 2.6% in the Americas (Statista, 2021c, p. 12 & 14), while the estimated CAGR of plant-based meat alternatives are estimated to increase with 14.4% in Europe and 14.6% in North America between 2018-2026 (GlobeNewsWire, 2019). However, other meat alternatives are also gaining traction. For instance, the U.S. market value for edible insects amounted to \$8 million in 2018 (Statista, 2018). This growth is to a large extent driven by the same macro-level factors of the changes in the dairy industry: “the higher health consciousness, the well-being of animals, and the awareness of global climate change led to a trend towards meat alternatives, such as plant-based products, at the meat market.” (Statista, 2021c p. 24). Hence, the future points towards a growth in the plant-based segment here as well, while the growth in the traditional meat industry is limited (Statista, 2020b, p. 44). Together with the changes happening in the dairy

industry, this hints at a potential future of a growing plant-based food and drink segment that might win market shares from incumbents within several different industries.

6.3 Outcome of the Study

The purpose of this study was to explore and comprehend the factors that might drive and moderate the business model innovation efforts of dairy industry incumbents, in the European and North American markets, and to create an understanding of how aligned efforts of business model innovation may be carried out. Consequently, the following research question was formulated:

- How are external and internal factors affecting the business model innovation efforts of dairy industry incumbent firms?

The findings of the study revealed that animal welfare, sustainability, and health, are three major macro-level factors that have been and are driving dairy incumbents to innovate their business models. These factors are on the one hand strengthened by regulation and political intervention, and on the other hand by social trends and preferences. Together, these factors illustrate a change towards more sustainable and healthy eating and drinking practices, both in regard to animal- and plant-based dairy products.

Our findings further reveal that consumer preferences, industry stability, and value migration are three major industry-level factors that have been and are driving dairy industry incumbents to innovate their business models. By exploring these factors, our analysis indicates that the dairy industry has been characterized by incremental changes and stability for a relatively long period of time. As the nature of these factors have changed slightly over time, dairy incumbents seem to have adjusted their business models in incremental ways, such as by replacing single elements of the business model, or by adjusting the overall architecture of it.

However, in line with the introduction and growth of the plant-based dairy segment, a tipping point seems to have been reached. This causes disruption in the industry since plant-based dairy alternatives cannot be as easily incorporated into the existing business models as previous

incremental changes have been. A major reason for this is the dramatically different production process for producing plant-based dairy alternatives in comparison to traditional animal-based dairy. Hence, the technological aspect is also an important factor, that both is related to the industry and the specific firms that are operating within the industry.

Our findings further indicate that dairy incumbents are strategically inflexible, as they have capital intensive assets that are specific for the production of dairy products. In line with the industry's overall incremental improvement, resources have been allocated to improve the cost-effectiveness and scalability of these production processes. Investments have also been made to respond to gradually changing consumer preferences and needs. However, as mentioned, such developments are characterized by incremental rather than radical business model innovation efforts. Ownership structure has also been found to be a moderator and driver that is affecting the business model innovation efforts of dairy incumbents. As illustrated with the example of Arla, owners might be reluctant towards moving into a new segment as value might start to migrate from their primary sources of revenue to other adjacent product types. However, synergies might also be created as activities in the value chain can be combined. For example, dairy farmers might be able to produce cow milk and grow crops for plant-based dairy production simultaneously. Contrastingly, the acquisitions that have been made by Danone and Kavli, as a way of moving into the plant-based segment, might instead be examples of secondary and/or parallel business model innovation. Through such types of business model innovation, elements such as the customer value proposition can be integrated, while elements such as the production might be more challenging. However, these internal moderators and drivers of business model innovation have been difficult to examine through our secondary data analysis.

6.4 Theoretical Implications

This study adds to the identified research gap on the alignment between business model innovation and the environment in which a firm operates. Through our analysis, we identified several factors that both can drive and moderate business model innovation in certain contexts. These factors stem from three levels of a firm's environment: the macro-, the industry-, and the internal environment. Since drivers and moderators can stem from factors in all of these environments, this might be an adequate approach for further investigating the alignment of business model innovation efforts. Furthermore, our findings strengthen the perspective that a harmony between internal and external properties are crucial for firm performance and competitiveness (e.g. Hamel & Välikangas, 2003; Chesbrough, 2010; Demil & Lecocq, 2010; Teece, 2010; Zott & Amit, 2012; Baden-Fuller & Haefliger, 2013; Casadesus-Masanell & Zhu, 2013; Cucculelli & Bettinelli, 2015; Gibe & Kalling, 2019). It also provides a foundation regarding the specific factors that should be considered when trying to comprehend the characteristics of this harmony, i.e. PESTEL-factors, consumer preferences, industry stability, value migration, strategic flexibility, ownership structure and potentially the role of cognition. Though, some of these factors might specifically be relevant when looking at the dairy industry and its adjacent industries.

Our findings also indicate that business model innovation can yield important advantages although it is incremental. This is an important point since slight adjustments of already existing business models might be adequate in order to create alignment. This stands in contrast to scholars that take a narrower approach to the concept of business model innovation and argues that only radical types of business model innovation can yield benefits such as competitive advantages (e.g. Voelpel et al. 2004; Johnson et al. 2008). Hence, our study also adds to the emerging definition of what business model innovation actually is, as our results indicate that there can be different degrees of it, ranging from incremental to more radical, as well as secondary and parallel business model innovation.

6.5 Practical Implications

We recommend managers in the dairy industry to specifically monitor the identified macro-level factors, as well as the technological development and the changes in consumer preferences. We deem these changes to be of significant importance as they to a large extent characterize the changes that are happening in the dairy industry. When it comes to technological developments, there is much to expect in the future in regard to plant-based dairy alternatives, illustrating both an opportunity and a threat. Furthermore, many consumers are choosing plant-based dairy alternatives out of preference rather than necessity. Plant-based dairy alternatives should therefore be seen as a substitute to animal-based dairy, that in many ways can fulfill the same needs. Overall, these changes are especially important to monitor as changes in the existing business model need to be aligned with them.

6.6 Limitations and Future Research

A considerable limitation of this study is that it primarily builds upon secondary data. Hence, there are several opportunities for further investigating and understanding the factors that we have explored by collecting primary data from industry experts and managers. Further research could therefore investigate how dairy incumbent firms have innovated their business models, and whether these changes have been reactive to changes that already have happened, or active by anticipating future changes. Hence, a more detailed understanding of how firms can carry out business model innovation in response to changes in the environment can be created. This would also add to the internal factor “role of cognition” which we were not able to investigate and explore due to primarily having access to secondary data. However, getting access to such data should not be taken lightly, as have been illustrated in our study.

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Appendix

Appendix A: Interview Questions

Introduction

- Is it okay for us to record the interview so that we can transcribe it later?
- Is it okay for us to use your name, title, as well as the firm's name in our thesis?
- Is there anything else you would like to know about the study before starting?

Industry factors

- How would you describe the current state of the dairy industry?
 - Pace, stability, consolidation and so on
- How do you perceive that the consumer preferences and needs have changed over the past years?
- What do you perceive as the most important factors for creating customer-value in the industry?

Business Models and Business Model Innovation

- How would you describe the business model(s) of [firm's name]?
- Are there any differences between the business model of the traditional dairy business and the plant-based business?
- Do you believe it is important to alter the business models as the industry changes?
- Are you continuously altering and adjusting your business models in relation to industry changes?

Appendix B: Significant Investments

Arla	Types of investments
Arla Foods, (2016, p. 50)	Most of the investments focus on production upgrades that will increase profitability of products sold in markets like Germany, the UK, Denmark, Sweden, the Netherlands and Finland, as well as on production sites that supply high-quality dairy products to Arla's emerging markets outside the EU. Some examples include the following: Rødkærsbro which is one of the leading mozzarella sites in the world, Danmark Protein which is a protein, lactose and other highly value-added whey-based ingredients for the global food industry, a cream cheese dairy site in Holstebro introducing new, innovative packaging designs and lastly, investment in better energy efficiency across all sites.
Arla Foods (2017, p. 13)	Our Ingredients business continued to deliver growth in 2017 with its high-value added products. New investments and strong research and development efforts paved the way to transform the business with a focus on higher-value specialties.
Arla Foods (2017, p. 28)	With increased media investment into prioritised channels, data-led targeting and high-quality content, the brand over-delivered compared to our 2020 engagement target, engaging 42 million consumers worldwide. Digital will continue to be a priority channel for Lurpak® going forward, as media landscapes change and we have the opportunity to reach more consumers in new ways.
Arla Foods, (2017, p. 26)	The Arla® brand showed strong growth due to increased investment in innovative product ranges, such as Arla® Lactofree, skyr and other natural and high-protein products, as well as infant nutritional formula such as Arla Baby & Me®.
Arla Foods (2017, p. 34)	In our TPM business, we conducted large investments to increase our supply of infant formula.
Arla Foods (2017, p. 67)	Arla continues to focus on growing our branded share of volume and increasing our investments in product innovation.
Arla Foods (2019, p. 8)	The Calcium transformation programme commenced in 2018 to create significant cost and operational efficiencies and reinvestment opportunities in Arla's continued growth. The programme will run over three years and aims to unleash the full potential of our organisation. Calcium exceeded the 2018 target: we saved EUR 114 million with the programme, EUR 84 million more than expected.

Arla Foods (2019, p. 8)	Arla acquired Yeo Valley Dairies Limited, enabling Arla to use the Yeo Valley brand in the UK market for milk, butter, spreads and cheese under an intellectual property license with Yeo Valley. The investment provides a significant opportunity to strengthen our branded organic business segment in the UK.
Arla Foods (2019, p. 24)	Further investment in AFI is a top priority for 2019. We will focus on the continued transformation of existing products to higher-value specialties, through new investments and focused research and development efforts.
Arla Foods (2019, p. 26)	With digital investment remaining consistent over the last 12 months, the increase in digital engagement is due to the strong use of first party data to drive engagement across owned media channels with stronger content and optimising our consumer experiences at the ultimate moment of truth, when consumers are searching for an Arla® product.
Arla Foods (2019, p. 57)	In line with our strategy Good Growth 2020, Arla continues to focus on growing our branded share of volume and increasing our investments in product innovation.
Arla Foods (2018, p. 61)	Major focus areas included new production methods, new whey processing technology in AFI, capacity expansion, for example within child nutrition and milk powder, as well as structural optimisation of our fermented dairy production footprint.
Arla Foods (2019, p. 85)	Major investments in 2018 included a general upgrade and expansion of production facilities with a particular focus on our ingredients business, optimising production capacity within the yoghurt and nutrition categories as well as initial investments in powder capacity expansion.
Arla Foods (2020, p. 60)	In 2020, significant investments were made in Arla's global supply chain and IT infrastructure. Further key investments related to the construction of their powder tower in Pronsfeld, Germany, a capacity increase in mozzarella production at their site in Branderup, Denmark, as well as investments in the plant that was acquired in Bahrain in 2019. Additionally, Arla changed their investments process by formalizing "... the use of a climate-adjusted payback indicator to embed the carbon footprint of CAPEX and M&A investments into our investment approval and prioritisation process, underlining our commitment to investing in the sustainable future of dairy.

Danone	Types of investments
Danone (2015a, p. 11)	We're adapting our brands to new consumer expectations, investing more in research (+9% in 2015) and expanding our production facilities to keep pace with our growing business. At the same time, we've begun transforming our internal structure and processes, and that, too, is laying the groundwork for Danone's future. For example, we've replaced our conventional annual budget with an ongoing reallocation process, reviewing performance and needs every quarter. In today's volatile environment, this new process lets us allocate resources where we need them, for the short, medium- and long-term. We benefit from greater flexibility while keeping our strategic goals clearly in sight.
Danone (2015a, p. 29)	In December 2015 we announced that we will build a new plant for the Early Life Nutrition Division. Nutricia's Cuijk facility will double production capacity in the Netherlands, keeping pace with growing demand for Aptamil, Nutrilon and other international brands. The €240 million plant, Danone's largest investment in European production capacity, will start up in late 2017, exporting output to over 80 countries.
Danone (2015a, p. 66)	By 2025, the 3F Fund will have invested €120 million to help 200,000 African, Asian and Latin American farms convert to sustainable farming practices...
Danone (2015b, p. 3)	In the CIS and in North America, we are guiding our operations carefully through the current transition, to get growth back on track while pursuing investments to develop the category.
Danone (2015b, p. 4)	<p>The Company also benefited from successful moves to streamline Danone's Fresh Dairy Products portfolio in Europe and ongoing efforts to optimize costs across the regions where it operates.</p> <p>In the first half, Danone built on these structural improvements and falling commodity prices to step up investment in its brands, products and structures to secure its equation of profitable growth.</p>
Danone (2016a, p. 44)	Danone has joined forces with nine other large companies in support of the Livelihoods Fund whose mission is to invest in projects with a great environmental and social impact, particularly the restoration of natural ecosystems... (total investment volume: \$40m)
Danone (2016b, p. 5)	...Danone continued to step up investment in its brands to ensure future growth, while relying on disciplined resource allocation and funding short-, mid- and long-term initiatives appropriately. These investments will continue in the

	second half of the year, in particular with the relaunch of the Activia brand.
Danone (2017, p. 6)	Fan Milk launches FanMaxx in Ghana, an innovative long-shelf-life, creamy drinkable yogurt and the first of its kind in West Africa. Danone and its partner Abraaj invest \$25 million USD, adding three new production lines to its factory in Accra to sustain the growing demand for its products on the Ghanaian market.
Danone (2017, p. 7)	Danone Manifesto Ventures invests in French startup Yooji, founded in 2012 and offering small-portioned organic frozen baby food recipes. A new milestone, after having invested in French food startup Michel et Augustin and Farmer's Fridge, a U.S. company that distributes freshly-prepared food through refrigerated vending machines.
Danone (2017, p. 50)	Marking its 10th anniversary in 2017, Danone Communities invested in two new social businesses that will bring safe drinking water to low-income communities in Haiti, Kenya, Rwanda and Uganda as part of its ambition to scale up an innovative model for safely treated drinking water.
Danone (2017, p. 51)	Encouraged by the results achieved since 2011, a second Livelihoods Carbon Fund, with an investment target of €100m, was launched in December 2017 to accelerate social, business and environmental impact to improve the lives of 2 million people and avoid 25 million tons of CO2 emissions.
Danone (2018, p. 03)	As we keep deploying our purpose-driven Manifesto brand model and investing in disruptive ideas, we remain well prepared to seize new opportunities and reach bold ambitions...
Danone (2018, p. 6)	Danone Manifesto Ventures invested in Yumble, a company helping more parents serve healthy foods to their kids.
Danone (2018, p. 7)	Danone Manifesto Ventures invested in Mitte, a German startup that has created a smart water system...
Danone (2019, p. 7)	Danone Manifesto Ventures invested in Forager Project, a Californian start-up specializing in organic, plant-based food and beverages.
Danone (2019, p. 15)	In February, we set out a €2 bn investment plan on brands, agriculture, packaging and digitalization to put climate action even more at the core of our growth model.

O. Kavli AB	Types of investments
O. Kavli (2015, p. 2)	The investments during this year primarily pertain to a rebuilding in step with the move of production in Vinsta to Älsjö, which constituted 44% of this year's investments. Other larger investments are improvements in line- and process-related arrangements, as well as rebuilding of offices and test-kitchen in Älvsjö.
O. Kavli (2016, p. 2)	The investments during this year primarily pertain to replacement investments for machines and other equipment. Other large investments have been improved cooling capacity in Älvsjö and equipment for the sales force.
O. Kavli (2017, p. 2)	The investments during this year primarily pertain to the production, such as new equipment for mustard production.
O. Kavli (2018, p. 2)	The investments during this year primarily pertain to the production.
O. Kavli (2019, p. 2)	The investments during this year pertain to a storage facility as well as the production.