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DETERMINANTS OF SUSTAINABLE PACKAGING IMPLEMENTATION IN FOOD SECTOR ENTERPRISES IN LATVIA

Bachelor thesis

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This paper conforms to the requirements for a bachelor thesis

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(signature of the supervisor)

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I have written this bachelor thesis independently. Any ideas or data taken from other authors or other sources have been fully referenced.

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Introduction

Efficient packaging waste management is key to reducing environmental problems, such as marine pollution, air pollution and landfills. While food packaging waste can be managed post-production, it creates vast inefficiencies; one can power a light bulb for 3 hours with the energy saved from recycling 1 plastic bottle, while some food packaging is not bio-degradable at all (Hall, 2017) and goes straight to landfill to be never corrupted. Packaging, used in increasing amounts across all industries (Interpack, n.d.) is liable for gaseous air, soil, water pollution arising from all the stages of the packaging sourcing, production, transportation, and repeated use or dumping. Therefore, sustainable packaging implementation in product manufacturing process itself is crucial.

European Union (EU) and packaging industry attempts to tackle the issue have not been hugely successful. While in EU waste declined by 7% in previous decade, only 47% of household waste is now recycled or composted, while 25% is disposed, and Latvia still lagging far behind with 78% of waste going straight to the landfill (European Parliament, 2018).

Government waste-management supporting programmes and wide-spread bans of single-use plastics in European countries like France are effective, but the waste management implementation progress in less developed countries is slow due to waste management costly implementation, from 20% to 50% of municipal budget (World Bank, 2018). Alternative private sector involvement is frequently overlooked by governments; however, market demand drives change, as sustainable consumption is going mainstream in Europe (Environmental Leader, 2018). These trends call for enterprise involvement, embedding sustainability into its products and packaging.

While sustainable packaging is well understood in theoretical, institutional setting, the implementation guidelines and framework have been developed only recently, and the

concept is still not adopted by most food manufacturers. Topics of green packaging (Holdway, Walker, & Hilton, 2002), and close research branches of sustainable packaging, green supply chain management (Shankur, 2004; Tsireme, Nikolau, Georgantzis, & Tsagarakis, 2012; Rao and Holt, 2005), green and sustainable packaging logistics (Zhang and Zhao, 2012; Garcia-Arca, González-Portela Garrido, & Prado-Prado, 2017) have been of a concern in environmentally-aware developed economies (New Zealand, Finland, Germany and United Kingdom), as well as developing economies where supply chains are governed and integrated with such environmentally-aware markets (China, Malaysia). Research in sustainable packaging specifically in food manufacturing sector mostly addresses the problem of food waste, not drivers or barriers of its packaging implementation; related integrated approaches, such as sustainable packaging logistics, focuses on packaging integration across the supply chain.

Previous research largely does not address the issue of sustainable packaging implementation determinants in food industry; yet, precisely the fast-moving consumer goods, among them food industry products, are the major contributors to plastic waste, and showing no signs of change (Greenpeace, 2018). Therefore, author finds it important to research sustainable packaging implementation determinants in food manufacturing sector. The case study will assess Latvian enterprises, as they are expected to undergo changes in excise tax on natural resource usage in one-time use packaging (Latvijas Republikas Saeima, 2019); for that reason, it is crucial for enterprises to gradually implement sustainable packaging to reap the benefits of tax shield and gradually transit to more sustainable manufactured products. In Latvia, food industry is the leading manufacturing sector, (European Commission, 2017) and therefore becomes a focus of the following paper.

The thesis aims to find out, what are the determinants of sustainable packaging implementation in Latvian food manufacturing sector enterprises. The factors influencing the

choice to adopt sustainable packaging were researched based on a sample of enterprises in a leading manufacturing sector in a developed country in which market is becoming increasingly aware of sustainability issues. Therefore, Latvian food manufacturing enterprises were chosen. To achieve the research aim, there are several research tasks to be completed:

- Explaining the meaning of sustainable packaging and related concepts, and the peculiarities of application to food manufacturing sector
- Describing determinants for sustainable packaging implementation in food manufacturing sector based on previous literature
- Collecting qualitative data from sample of food manufacturing industry experts, regarding sustainable primary packaging implementation in food sector
- Finding out current practices, and bringing out the determinants of sustainable packaging implementation in food manufacturing sector in Latvia

The paper first gives a theoretical backdrop of the different concepts and approaches used for improving the sustainability aspect of packaging. Further, the sustainable packaging implementation, its barriers and drivers are discussed, as well as conceptual framework is set to further be used in empirical part of the research.

The empirical part will investigate the determinants of sustainable packaging implementation in food manufacturing enterprises in Latvia. The methods for identification of sustainable packaging implementation barriers and drivers will be secondary-data analysis. Further, qualitative interviews with managers of food manufacturers in Latvia will be conducted to assess the determinants for sustainable packaging adoption.

The paper is structured first giving an overview of the relevant concepts, then describing the findings of previous empirical studies, followed by description of methods used for research and the analytical part of the paper.

Keywords: sustainable packaging, green packaging, food sector, Latvia

Theoretical Framework of Sustainable Packaging Implementation Determinants in Food Manufacturing Enterprises

1.1 Sustainable Packaging Definition and the Importance for Enterprises

While packaging can be traced back to the early hunter-gatherer communities using animal skins and tree barks for food containment and transportation, the remodelled environment-friendly yet industrialized concept of food packaging is of a different scope and content. In following paragraphs, the framework of sustainable packaging is set.

Packaging is a material used to enclose or contain something (Merriam-Webster Dictionary). It can be divided into three levels (Figure 1): primary packaging (for final or finished product immediate packaging), secondary packaging (in addition to primary packaging for protection) and tertiary packaging (for storing, identifying and transporting goods; also called transport, transit packaging) (Waste & Resources Action Programme UK, n.d.). In this paper, primarily the first-level packaging will be studied, because in food sector, as Blakistone and Koelsch Sand (2007) recognized, the second and tertiary levels of packaging have already been studied extensively; moreover, primary packaging is the most influenced by consumer attitudes, coming into direct contact with consumer, and is distinct from others by the functions.

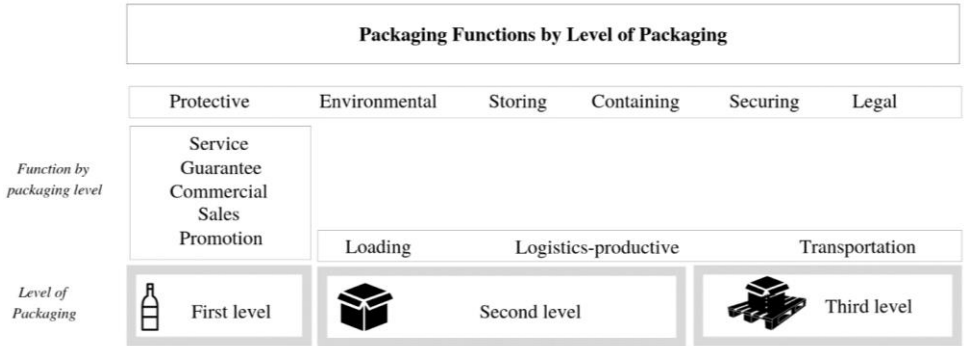

Figure 1. Packaging Functions by Level of Packaging. Compiled by author based on Waste & Resources Action Programme UK (n.d.), Garcia-Arca, González-Portela Garrido and Prado-Prado (2017) and Transport Information Service (n.d.)

The purpose of packaging depends on business core activity being either service (i.e. packaging as a part of transportation logistics; tertiary packaging) or product manufacturing (i.e. packaging as part of the final product; primary and secondary packaging). Generally, packaging has (Figure 1) commercial, logistics-productive, and environmental function. In literature concerning tertiary packaging, prior mentioned functions are extended to protective, storing, loading and transportation, while primary packaging functionality is sales, promotion, service, guarantee or legal compliance (Transport Information Service, n.d.; Garcia-Arca, González-Portela Garrido & Prado-Prado, 2017). For purposes of study of first-level packaging, functions of containment, protection, securing, promotion, sales and information will be considered, and are inclusive to the "commercial" function.

The commercial function is the most important for 1st level packaging, as it determines sales: packaging design which is aesthetically appealing, promotes the brand, contains the product in right amount and condition and communicates the value of the product, is appealing to consumer, and therefore will increase sales. For example, environmentally conscious consumers are more likely to purchase a product that communicates environmental values (either by standardised labelling or instant judgement of the package materials). Thus, design of the packaging is one of the most important properties in the product. (Ivezic, 2014)

For 2nd and 3rd level packaging storing, loading and transportation functions dominate; in short, logistics-productive function dominates, and previously discussed commercial, legal functions are largely irrelevant, thus secondary and tertiary levels of packaging are less distinct between manufacturing industries and sectors and constrained with legal requirements allowing for greater efficiencies in packaging choices.

Regarding food industry specifically, minimum packaging design requirements include preservability, safety for user and environment, and compliance with legislation. Preservability includes protection from moisture, temperature, gases, UV light, and other

flavours, aromas, ensure the designed shelf-life and designed temperature, as well as prevent product from breaking. Being safe to user and environment includes no use of toxic materials, hygiene, as well as minimum additives used. (Lindh, Olsson, & Bertoluci, 2011)

While legal function regarding health and safety requirements are absolutely necessary for packaging, the further discussed "green packaging" is therefore less achievable. However, legal function in application differs by legislation, industry and other factors, and is therefore secondary to sustainability factor of packaging, apart from the necessary condition of safety, which, however, is directly related to the core 1st level packaging commercial function.

Commercial function is dominating on the 1st level packaging, but environmental function becomes embedded into commercial function if market seeks and rewards environmental values, because *green* consumers reward packaging design that incorporates and promotes *sustainability*. Environmental function, however, is categorized separately by Garcia-Arca, González-Portela Garrido, & Prado-Prado (2017), and therefore calls for definition, along with the term *green* that is frequently used to describe environmentally conscious consumers' behaviour and niche marketing strategies from enterprise perspective.

Notions of *green* and *sustainable* are used rather interchangeably in previous studies, with green becoming increasingly popular (Rao & Holt, 2005; Wichaisri & Sopadang, 2014; Yanarella, Levine, & Lancaster, 2009), and therefore will be used synonymously in the following paper. While both terms are ill-defined, *sustainable* action, development or product refers to long-term balance and trade-off between economic perspective measured by financial profit and shareholder values, environmental (protection) perspective, and social (justice) perspective, captured in the concept of Triple Bottom Line (TBL) (Elkington, 1997; Slaper & Hall, 2011). TBL refers to the three pillars of sustainability: people, planet and profits (Slaper & Hall, 2011). Sustainable is therefore defined as meeting "the needs of the present without compromising the ability of future generations to meet their own needs"

(International Institute of Sustainable Development, n.d.), emphasizing the organization's impact on the world.

Similarly, "sustainable packaging" concepts also aim to bind business economic perspective with environmental perspective (in sources referred to as "green package"), or with both environmental and social perspectives ("sustainable packaging") of sustainability triple bottom line: economic, social and environmental incentives (Zhang & Zhao, 2012; Garcia-Arca, 2017). Objectives of sustainable packaging implementation are mostly related to quality, cost, profit (economics perspective), resource usage, pollution, emission, waste and eco-efficiency (environment) and less directly to social perspective (Wichaisri & Sopadang, 2014). The enterprise-level social perspective of sustainable packaging can be measured by safety and ease of use the products embedded into commercial function and is related to economic perspective. Just as the notion of "green", the concept of "green package" is new defining the concept in customer perception terms rather than its objectives. Yet, there are variations: some studies focus less on reverse systems (Holdway, Walker & Hilton, 2002) than others (Zhang & Zhao, 2012), but overall, author finds the concept of green packaging to be discussed in studies concerning supply chain stages closer to end-consumer, fitting with the previous findings by Browne, Piecyk, Whiteing, and McKinnon (2011) who claim the "green" concept to emerge as a more recent and mainstream term for simplified application and appeal to large audiences.

The author of the research paper is going base the methodology for sustainable packaging (Figure 2), building it on sustainable packaging logistics (specifically packaging) proposed by Garcia-Arca, González-Portela Garrido and Prado-Prado (2017), green packaging concept by Zhang and Zhao (2012) and sustainable packaging definition (Sustainable Packaging Alliance, n. d; Sustainable Packaging Coalition, n.d.).

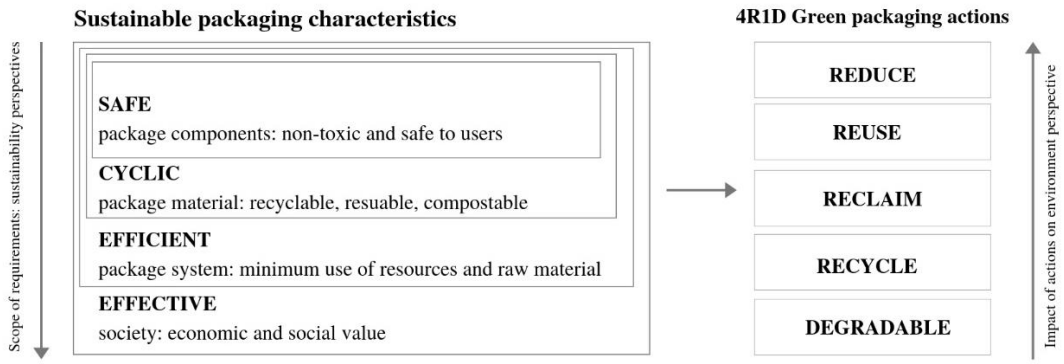

Figure 2. Sustainable packaging model. Compiled by author based on Zhang and Zhao (2002), James, Fitzpatrick, Lewis, & Sonneveld (2005) and Sustainable Packaging Alliance (n.d.)

The importance of the model lies in sustainable packaging characteristics being embedded and categorized level by level, and the concept being interrelating with the 4R1D (Reduce, Reuse, Reclaim, Recycle, Degrade) framework of implementation, explained further.

Compulsory packaging characteristics are prioritized over others and are placed in the core. Moving further from safety, the cyclability (about packaging material), efficiency (regarding package system), and lastly, effectiveness, is achieved. The construct of sustainable packaging is prioritizing compulsory characteristics and placing them in the core. First, it addresses commercially mandatory packaging functions, as safety (legally binding and concerning marketability of product), then moves further from compulsory to firm-initiated characteristics, focusing on social and environmental perspectives as well, not only the economic one. The cyclic characteristic tackles the environmental aspect of sustainable packaging (environmental perspective dominating), and only then the efficient use of resources (environmental and economic perspective), leaving the effective systematic implementation of the last sort (social and economic value; public integration and systematic approach). It must be noticed that the concept (just as majority of packaging marketing

literature) does not separate packaging from the product; they are united in one commercial function. (Sustainable Packaging Alliance, n.d.; Sustainable Packaging Coalition, 2011)

Looking at Figure 2, it must be noted that the sustainable packaging characteristics are directly related to its implementation, hence 4R1D actions, and serves as a framework or vehicle to assist in its implementation.

In the opinion of the author of this paper, the "green packaging" concept by Zhang and Zhao (2012), and Holdway, Walker, and Hilton (2002) is rather vague. Its strength lies in its green packaging system, a clear pathway of green packaging system implementation from institutional, environmental standpoint. Contrary to Sustainable Packaging Association's (SPA) sustainable packaging construct, in green packaging safety is not emphasized, but taken for granted, and effectiveness is rather neglected, leaving model with focus on environmental perspective, and marginalising economic and social perspectives. Author of this paper concludes that the difference in hierarchy arises also from the fact that packaging is considered separately from product itself; therefore, commercial function is marginalised, but environmental and logistics-productive functions are dominating. Author recognises that result of such view is model's emphasis on packaging efficiency improvements, especially reverse flows and reuse, reclaiming and recycling. Author also concludes that due to highly conceptual view, the model is less useful as a framework for enterprises willing to implement sustainable packaging.

Firstly, the concept of green packaging will be discussed. The concept, according to various authors in both macroeconomic (Zhang, Li, Wang, & Ma, 2010; Zhang & Zhao, 2012) and microeconomic-focused literature (Holdway, Walker, & Hilton, 2002) define green package as a one which causes the least pollution (form of inefficiency) possible over the whole product life cycle, and therefore is hurtless to environment and animals (both

humans and nun-humans), with the main functions to protect environment and renewable resources.

All authors approach definition in actionable steps, and the 4R1D principle is becoming a common ground. The green packaging system includes research and development of raw harmless packaging materials, promotion of package waste recycling and integrated control techniques (Zhang, Li, Wang, & Ma, 2010). It is well captured by the 4R1D model which sequences the activities in the order of the most to least effective for environment and preferable for firms to implement (Zhang & Zhao, 2012; Holdway, Walker & Hilton, 2002):

1. Removal or reduction of packaging – while allowing for protection, storing, loading, transportation, sales and other packaging functions, firms shall use the least material possible, making it thin and lightweight, and never use without a solid need
2. Reuse or rethinking of packaging – firms shall use containers repeatedly after a necessary treatment; this also includes refillable packages for use at home; rethinking of the ways one can use packaging obtained
3. Reclaiming of packaging – one shall obtain new energy resources from the first instance packaging in its entirety, and not to produce secondary pollution (for example, compost for gaseous heat, or soil enrichment), thus efficiently and harmlessly reclaiming the package as whole
4. Recycling of packaging – if reclaiming the entire package is impossible, then separation and splitting by materials to make new low-cost, low-pollution and low-power packaging materials is preferred; firms shall reuse packaging for its material (paper, board, plastic) to decrease the demand for first-use raw materials, with the least pollution possible
5. Degradable packaging – if the waste cannot be recycled, it shall be able to degrade and corrupt, and not form permanent waste; firms can switch to bio-degradable

materials (ex: paper instead of plastic) that do not pollute the environment, yet without objective of efficiency; focusing solely on harmlessness

Defining “green packaging” concept, both macroeconomic-level studies (concerning mostly circular economy) and enterprise-level studies (concerning mostly packaging design); are emphasising the environmental perspective. It must be noted that economic perspective of sustainability is still embedded and taken as a precondition when environmental perspective is concerned, but social perspective of the TBL is frequently overlooked.

The connection between green and sustainable packaging can be traced to logistics and where the concepts are located on the supply chain axis, as already discussed before. While “green package” concept is commonly found in literature concerning packaging levels exposed to the end-consumer and integrated with green logistics principles (Zhang & Zhao, 2012), sustainable packaging concept puts an emphasis on holistic, all-level packaging integration during all stages of supply chain (Sustainable Packaging Coalition, 2011). While both systems are related, and support each other, the green packaging does not emphasise in-house material recycling, and focuses on the forward and reverse flows from customer’s perspective. Sustainable packaging, however, is a term implying more scientific approach, and all three sustainability perspectives are explicitly tackled.

Regarding the assessment and measurable definition for sustainable packaging, several indicators have been established called Packaging Impact Quick Evaluation Tool, which is built upon Life Cycle Assessment indicators and packaging-specific indicators. Author compromised the indicators representing first-level packaging, 4R1D model, in table 1.

Table 1.

Sustainable packaging specific indicators based on SPA Packaging Impact Quick Evaluation Tool and 4R1D concept

Sustainable packaging characteristic	**Indicator**
Reduction	Product/packaging ratio
	Packaging to landfill as percentage of the total and by weight
	Packaging as percentage of packaged product weight
Reuse	Packaging reusable as a percentage and by weight
Reclaim	Packaging to reclaiming as a percentage and by weight
Recycle	Packaging to recycling as a percentage and by weight
Degradable	Packaging degradable material as percentage and by weight
Miscellaneous	Packaging material summary
	Method(-s) of waste recovery used

Source: Compiled by author based on Zhang and Zhao (2012) and SPA (n.d.)

Conceptually, view on packaging-related decision making is frequently isolated, and wrongly so. Sustainable packaging views product and packaging as one and studies stress the need of packaging to be designed together with the product to increase its sustainability (Grönman *et al.*, 2013); studies also argue that packaging reproduces the complex relationship supply chain flows, and therefore must be designed and integrated along all supply chain divisions (Garcia-Arca, González-Portela Garrido & Prado-Prado, 2017).

Although sustainable packaging also encompasses transportation and management of supply chain reverse flows, and reclaiming and reusing packaging, these activities are not necessarily carried out on the private sector; the public sector regulations, incentives or reclaiming or recycling system infrastructure can aid private sector actors across the supply chain, from packaging material manufacturers. The main objective of green packaging defined by Zhang and Zhao (2012) and Zhang, Li, Wang and Ma (2010), as well as Holdway, Walker and Hilton (2002) is to develop a package with the least harm to environment; whether it is the enterprise itself, or public system who carries out some of the functions, is not as important theoretically. In sustainable packaging logistics model activities are carried out along the supply chain, on the firm level. While it may be viable for industrialized

economies of scale, the food manufacturers in Latvia are unlikely to have capability and length of supply chain sufficient for sustainable packaging integration on firm level exclusively. In smaller countries, packaging reclaiming systems as public incentives are used (Estonia, Latvia). Therefore, this paper is bound to the environmental and economic packaging perspectives only, without a specific reference to supply chain integration, or social aspect of sustainability.

Thus, sustainable packaging in food manufacturing sector for purposes of this paper is defined as safe, cyclic, efficient and effective packaging satisfying the economic perspective of the firm, and posing the least harm to environment, with incentives to packaging reduction, reuse, reclaim, recycling and bio-degrading. It carries functions of containment, protection, promotion, sales and legal function.

Regarding the importance of sustainable packaging for enterprises, it lies in sustainable packaging implementation being means to achieve higher competitiveness by optimizing operational costs and taking advantage of marketing opportunities leading to higher revenue, larger market share and new market opportunities with standard adoption (Rao & Holt, 2005). In a study of food processing enterprises, it was found that all tree sustainability perspectives are important; however, for businesses economics perspective is of utmost importance, with environmental and social perspectives following (Wichaisri, Sopadang, 2014). Holdway, Walker and Hilton (2002) allocates the importance of different aspects on timeline. They, too, recognize the financial aspect to be important in short term; however, the importance for enterprises surpasses the strictly economical perspective in long-term operations, with environmental and social factors playing increasingly important role.

In summary, encapsulated in terms “green packaging” or “sustainable packaging” depending on either focus on end-customers or enterprise-wide, supply-chain-wide packaging integration incentives, such packaging is referring to sustainability TBL aiming for packaging

which is the least harmful to environment and people, while complying with economic aims of enterprises. Sustainable packaging in food sector is safe, cyclic and efficient, and is achieved by 4R1D model of packaging reduction, reusing, recycling, reclaiming, and design using biodegradable materials. Such packaging is important to enterprises due to cost efficiency allowing for competitive advantage, especially in environmentally aware consumer markets where marketing advantage can also be attained.

1.2 Literature Overview of Determinants of Sustainable Practice and Sustainable Packaging Implementation in Food Industry

Studying previous empirical literature, author came across a set of determinants that drive and impede sustainable packaging adoption, which are of different importance with respect to consumer awareness, firm size, industry and institutional regulations. Studies in developed world concerning consumable manufacturers identified determinants such as cost, supply chain partner pressures, regulatory amongst other institutional pressures, market demand, and enabling factors, such as awareness and information of sustainable packaging in companies, as well as wider availability of technology to be the most important. To better structure determinants, author will separate them with respect to their source into internal and external.

Internal determinants include both internal capability and internal resource factors which influence customers, competitors, employees and enterprise systems and thus determine the initiation, planning and realization of project implementation, bringing competitive advantage (Schaller, Rackensperger & Reichwald as cited in Stucki, 2009). External determinants influencing enterprise implementation of innovation and by Bransch (as cited in Stucki, 2009) referred to as “external factors” are environmental determinants (political, legal, cultural, economic, ecological and technological) and firm-specific factors (partners, customers and competitors) alike. In this paper, external factors will be referred to

as “external determinants,” no matter if they only enable or undermine the firm’s strategic decision making. While both models regarding internal and external determinants refer to consumers as an important factor, consumer, competitor and market factors will be considered as internal determinant when competitive advantage arising from internal operating cost efficiency increases is concerned, and as an external factor in cases when consumers drive the marketing-related gains, value and reward sustainable packaging., Partner and competitor firm-specific determinants will be referred to as external factors, taking into account the small scale, young age and generally less stakeholder-integrated food sector manufacturing firms in Latvia. Therefore, contrary to Hart’s (1995) approach to internal and external environmental management factors integrating firm-specific external factors into company’ s internal management system in later stages of environmental management, this paper will view partners and competitors of enterprises as external factors.

Regarding internal determinants of sustainable packaging adoption (Table 2), the most important driving (and impeding) factor is the resource, specifically financial resources, related to economic perspective of the sustainable packaging, and less so to environmental. Companies (both packaging-manufacturers, food manufacturers and food retailers) implement sustainable packaging initiatives driven by the cost efficiency; operational cost cutting a result of packaging material reduction or complete dematerialization (Lofthouse, Bhamra & Trimingham, 2009), lower cost of recycled material and lower energy consumption for transportation and packaging manufacturing (Blakistone & Koelsh Sand, 2007). Although sustainable packaging costs are recoverable, and its systematic implementation is profitable after certain amount of time (Singh & Pandey, 2019), the decision also depends on the size of the firm. Smaller enterprises are less likely to take on risks (Weng & Lin, 2011) of fluctuations in sales due to customer response to packaging redesign (Gustavo, Pereira, Bond, Viegas, & Borchar, 2018). Smaller enterprises also have

fewer human resources to implement a holistic sustainable chain management system, a factor which is enabling and supporting sustainable packaging implementation long-term (Lofthouse, Bhamra, & Trimingham, 2009).

Table 2.

Summary of previous studies: internal determinants and enablers to sustainable packaging and sustainable practice implementation

Author	**Determinant effect**	**Type of Determinant**
Lofthouse, Bhamra, & Trimingham (2009)	Cost efficiency and sales increase due to refillable package marketing and customer lock-in is a driving factor; manufacturing takes more resources due to different product lines and initial equipment investment	Resource (cost), market demand
Gustavo, Pereira, Bond, Viegas, & Borchar(2018)	Cost recovery is certain, but the payback period varies from industry to industry and can take a long time.	Resource (cost)
Grekova, Bremmers, Trienekens, Kemp, & Omta (2014)	In meat sector, efficiency gains as cost advantage are not positively determining sustainable packaging implementation; otherwise financial resource is not a factor	Resource (cost)
Blakistone & Koelsh Sand (2007)	Efficiency fuelled by TBL can allow for operational cost cutting (cheaper recycled material, less raw material, etc)	Resource (cost)
Frederick & Elting (2013)	Efficiency gains from operational cost cutting is driving factor, as well as flat hierarchical structure; sufficiently large management planning period enables implementation of more sustainable initiatives	Resource (cost) Awareness and organizational structure
Lindh, Olsson, & Bertoluci (2011)	Availability of assessment tools are determining the sustainable packaging design; new packaging types available to manufacturers enable implementation, while packaging design and material availability is limiting and negatively determining sustainable packaging	Technology and information

Source: Compiled by author

Although cost is the most important internal determinant in firm sustainable packaging adoption, awareness, attitude, information and technology factors are important as

well. Lack of information of available packaging design and materials is impeding sustainable packaging adoption, a barrier which is mitigated by technology availability, such as assessment tools for packaging materials assisting designers (Lindh, Olsson, & Bertoluci, 2011). Another enabling factor is flat hierarchical structure of the company, allowing for quick and flexible decision making, which can, however, become burdensome when there is no strategic planning to implement sustainable packaging in a systematic manner (Frederick and Elting, 2013).

Overall, internal factors mostly relate to economic resource perspective and the commercial and sales function of primary packaging and is taking advantage of its overall cost-efficiency. Determinants as technology availability, management attitudes and awareness across the organization, as well as information availability are less important in decision making in case of smaller enterprises, but such capabilities influence system development, which characterizes larger enterprises due to larger availability of human resources, and therefore a capability to research, implement new projects and develop products in a systematic manner.

The author compiled the overview (table 3) of studies done in different sectors of food and beverage industry, or studies done on sustainable packaging in fast-moving consumer goods sector (Lofthouse, Bhamra, & Trimingham, 2009). Some studies were conducted analysing redesign of packaging from retailer's point of view (Gustavo, Pereira, Bond, Viegas, & Borchar (2018) while some were focusing on green strategy implementation in food sector specifically (Frederick & Elting, 2013 Grekova, Bremmers, Trienekens, Kemp, & Omta, 2014; Lindh, Olsson & Bertoluci, 2011, Blakistone & Koelsh Sand, 2007). Concerning studies done specifically in food sector, they covered either sustainable packaging implementation in specific sector, such as fish (Blakistone & Koelsh Sand, 2007), or green innovation implementation in the industry overall (Frederick & Elting, 2013;

Grekova, Bremmers, Trienekens, Kemp, & Omta, 2014). Studies were done in Westernized countries (US, New Zealand, Australia, Netherlands) where consumers are highly aware of sustainability importance. In some cases, the studies measured sustainable packaging implementation by the process firm had adopted (refillable packaging study by Lofthouse, Bhamra, & Trimingham, 2009; Frederick & Elting 2013), while in some the packaging sustainability itself was not assessed and rather focused on determinants of managerial decision-making, judging the sustainability practices on self-assessment and additional information provided by enterprise managers (Gustavo, Pereira, Bond, Viegas, & Borchar, 2018; Grekova, Bremmers, Trienekens, Kemp, & Omta, 2014). Thus, the studies presented in the following table do not measure the degree of sustainability practices and do not correlate it with the factors determining sustainable packaging implementation.

Regarding external factors (Table 3), most important determinants in company' s decision to implement sustainable packaging also are related to economic perspective of sustainable packaging and is largely driven by market demand. It is, however, only present in countries where consumers are valuing and rewarding environmental incentives, hence, where green consumerism is present (Cuerva, Triguero-Cano, & Coroles, 2014). Otherwise, the pressures from institutions or supply chain partners are driving implementation (Massoud *et al*, 2010).

Table 3.

Summary of previous studies: external determinants and enablers to sustainable packaging and green practice implementation

Author	External Determinants	
Blakistone & Koelsh Sand (2007)	Overpackaging perception in consumer markets drives the implementation decision	Marketing and consumer awareness
Grekova, Bremmers, Trienekens, Kemp, & Omta (2014)	Regulatory frameworks, as EU directives, are not important; safety and health regulatory frameworks are more important; the presence of environmental covenants, leading enterprises with market power is pressuring others to implement sustainable packaging	Institutional, Supply chain partners
Frederick and Elting (2013)	Cooperation with suppliers determines sustainable packaging implementation	Supply chain partners
Gustavo, Pereira, Bond, Viegas, & Borchar (2018)	Retailer restrictions and pressure to redesign towards ecological packaging aids it, but design exclusivity clauses for distribution of innovate packaging impedes the motivation of manufacturers	Supply chain partners
Lindh, Olsson & Bertoluci (2011)	Power over suppliers does not positively determine it, but cooperation aids it.	Supply chain partners
Lofthouse, Bhamra & Trimingha m (2009)	Customer loyalty achieved by lock-in with refillable packaging aids company's motivation to implement reusable packaging, turning into competitive advantage and branding	Market demand

Source: compiled by author

Regarding the environmentally-aware markets, and food industry specifically, the main external driver is of economic perspective. Market demand, consumer awareness is pressuring firms to adapt packaging that is not perceived as in excess, is environmentally friendly. For firms, reusable containers allow to ensure consumer loyalty through lock-in (Lofhouse, 2009).

The second most important factor encompassing packaging commercial function, and arising from economical sustainability perspective, is the supply chain partnerships. Partners can be driving or impeding sustainable packaging adoption, but for food sector

manufacturers, in case of previous studies, distributors, especially large environmental covenants, are driving and pressuring, while packaging suppliers are largely impeding sustainable packaging implementation. The distribution chains, especially in markets rewarding sustainable packaging (New Zealand, for example) have power to pressure smaller manufacturers to comply with the rules imposed on them, driven as a reaction to the market demand, while suppliers of packaging are lagging behind the demand, oftentimes not being able to provide technology, disseminate information and adopt to specific product packaging design requirements to comply with needs of manufacturers. Study by Gustavo, Pereira, Bond, Viegas, and Borchar (2018) found that retailer pressure to adopt green packaging was forcing manufacturers to re-design their packages to comply with sustainable packaging requirements, but such process posed barriers to manufacturers because of the developed design exclusivity clauses. A more important external determinant, however, is the cooperation and power of the company over supply chain; smaller firms are in a disadvantaged position, as they lack the power over suppliers, while large firm cooperation with partners and packaging providers enable and support sustainable packaging design and implementation (Lindh, Olsson, & Bertoluci, 2011).

Regarding institutional factors, governments prefer using instruments and incentives for enterprise support, instead of direct regulatory governance (Grekova, Bremmers, Trienekens, Kemp, & Omta, 2014); regulations, however largely matter only regarding compliance with health and safety requirements, like EU Packaging and Packaging Waste Directive 1994/62/EC (European Parliament and Council, 1994) which prohibits use of dangerous substances in packaging; beyond that, there has been a regulatory gap, at the time of writing of source (Grönman *et al.*, 2013). These regulations are not regarded as important determinants of sustainable packaging adoption, as it is a mere requirement to comply with the obligatory commercial function of economical perspective. Regarding environmental

perspective of sustainable packaging, EU Directive (European Parliament, 2004) requires 60% of packaging to be recovered or recycled. However, the health and safety issue remains dominating, and food is limited to packaging reduction, reuse and recycling mostly (Lofthouse, Bhamra, & Trimingham, 2009). Firms identify institutional pressures of environmental covenants to be the most important determinants in environmentally aware markets (Grekova, Bremmers, Trienekens, Kemp, & Omta, 2014).

Overall, the most important determinants are of economical perspective in both internal and external sections. Internal resource-related factors (cost-efficiency versus cost of adoption recovery), and external factors of economic perspective (market demand and supply chain partner requirements) are the most influential in determining firm decision to adopt sustainable packaging. Next, regarding food packaging, limitations to environmental incentives are posed by external health and safety compliance requirements but mitigated and enabled by availability of new packaging technology; the information and awareness determining (barrier) factor is mitigated by free assessment tools. While the newly developed technologies are in most cases completely tackling the issue of material compliance with health and safety, at least on the 4R1D levels of degradability and recycling, the cost and availability of such technology in small markets is currently too high, leading to the internal resource factor determining the implementation. However, legal health and safety requirements are not determining sustainability aspect of packaging, as it is the core necessary condition of the packaging design and is in the core commercial interests of the manufacturer, irresectable of *greenness* of packaging.

Overall, determinants are closely intervened with external ones, with overall the most important factors being related to resource availability (financial and human resource), technology and awareness (organizational awareness and information about available technologies), supply chain stakeholder factor (pressure from environmental covenants),

marketing and sales (sales, promotion), and institutional factors (taxes, third sector support, health and safety requirements).

Case Study of Sustainable Packaging Implementation Determinants in Food Manufacturing Enterprises in Latvia

2.1 Methodology

To answer the research tasks, the author used the following data collection and analysis methods. Due to the lack of sound and comparable assessment method for sustainable packaging implementation, most studies on sustainable packaging are using qualitative interviews as primary research tool (Lindh, Olsson, & Bertoluci, 2011; Lofthouse, Bhamra, & Trimingham, 2009; Frederick & Elting, 2013).

For purposes of the bachelor thesis, first the determinants obtained from empirical literature overview were expanded and adapted to Latvian food manufacturing sector by interviewing one of the major sustainable food packaging providers in Baltic States and package-free store owner (table 4).

Table 4.

Interviews done with food manufacturing enterprises and their stakeholders

Interviewee	Sectors and Sub-sectors	Interviewee occupation	Length	Medium
1	Wholesale bakery and flour milling	General Manager	*33 minutes*	Telephone
2	Wholesale bakery	Marketing	*37 minutes*	Telephone
3	Retail bakery	General Manager	*37 minutes*	Telephone
4	Coffee and tea manufacturing	Co-founder; General Manager	*33 minutes*	Face to face
5	Meat processing	Marketing and Sales	*32 minutes*	Telephone
6	Meat processing	Marketing	*37 minutes*	Telephone
7	Seafood canning	Quality Manager	*38 minutes*	Telephone
8	Dairy manufacturing	Logistics Manager	*16 minutes*	Telephone
9	Spice and speciality canning	Founder; General Manager	*36 minutes*	Telephone
10	Packaging provider	Sales	*34 minutes*	Video
11	Package-free retailer	Founder; General Manager	*36 minutes*	Face to face

Source: compiled by author

Secondly, interviews with managers of the food manufacturing firms were set up. The firms in sample were first contacted by e-mail, author introducing to the research and talking about the main themes of the research. The author then sent the main interview questions beforehand. Interviews were conducted in various mediums, from telephone and video-calls to in-person meetings. These interviews were then coded, first determining the main themes brought out in the literature review and interview with Company 11 and then classifying relevant information by reading through and underlying interview transcripts and labelling the recurring determinants. Further, the recurring determinant list was systemized and the framework was applied to the newly obtained information.

The companies chosen for the sample are partially representing the food sector in Latvia with meat, dairy and baked good sectors dominating (Firmas, n.d.), and partially with regards to the wide disparities in sustainable packaging implementation and firm size. In total, 11 interviews were conducted, 1 of which were conducted with sustainable packaging provider, 1 with package-free store owner, and other interviews covering the main food industry sub-sectors: baked goods (3 interviews), meat processing (2 interviews) and seafood processing (1 interview), and dairy product manufacturing (1 interview), along with two sustainable speciality product manufacturers (2 interviews). The firms chosen for interviews were selected by local ownership and management, focus on domestic market (except interview 7), and primarily wholesale business activities (except interview 3), and doing business with entities in both urban and rural territory of Latvia. All enterprises largely cater mass market (except for 9 &3).

The exceptions to the general sample guideline choice were due to need to obtain more in-depth information about differences and similarities in presumably (according to the author) similar factors affecting fast-perishing products across in different subsectors

(exception: interview 7), as well as to gain an in-depth understanding of determinants for sustainable packaging adopted enterprises (exception: interviews 9).

The challenge to balance diversity with in-depth information on was thus partially tackled, focusing on specific food sub-sectors groups, mostly medium firm size.

Following the example of research by Frederick & Elting (2013) assessing New Zealand enterprises, author used the semi-structured interview containing similar questions obtaining background information of the firm, then exploring the determinants of sustainable packaging adoption in food enterprises (Table 5), aiming for a deeper understanding on factors in play, as well as attitudes of management and values of the company. Unlike in the study by previously mentioned authors, the study does not assess only partially or completely sustainable packaging-implementing enterprises, and therefore shifts the focus away from the implementation success depending on internal factors in play, such as organizational structure, to both sustainable and unsustainable packaging determinants, assessing the factors concerning not the quality and processes of implementation of sustainable packaging, but rather the adoption factors.

Table 5.

Semi-structured interview questions to food sector enterprise managers

Question
1. How large is the enterprise (per number of employees)? What are the main markets and segments?
2. How would you describe company sustainability initiatives being embedded into strategic goals, vision and mission?
3. Please, describe the product positioning with regards to product groups, lines and geographical markets. Do you differentiate with green and sustainable products?
4. Please, describe your current sustainable packaging practices!
5. How did you implement sustainable packaging? Via top-down decisions in the firm, or with collaboration between the units?
6. Have you adopted cross-validated environmental guidelines and certificates (ISO, ecological or biological product certificates)?
7. How do you handle the problem of choosing between lower price and less sustainable service, product or material, and more expensive, but more sustainable materials, products or services?
8. Where is the biggest challenge to maintain and implement sustainable packaging?
9. Do you have access to information and are you aware of the newest technologies available in food packaging? To what extent the knowledge, information and tools to assess packaging sustainability are available, is it enough?
10. How do you collaborate with packaging providers in developing new packaging?
11. Do you feel the pressure from the major retailer chains to make the packaging more sustainable?
12. Do you feel the initiatives (regulatory pressures, tax pressures, informational and awareness-raising pull-factors) of third sector to aid or determine the sustainable packaging implementation?
13. To what extend the food health and safety standards determine the choice of packaging?
14. Have you considered reusable or zero-packaging implementation? What influences the decision?
15. How does market awareness determine your decision to implement sustainable packaging?
16. What advice would you give to enterprises making the decision to transfer to sustainable packaging?

Source: compiled by author

The interview with packaging provider covered questions regarding trends and external pressures in global markets (Table 6).

Table 6.

Semi-structured interview questions to food packaging manufacturer and sustainable packaging retailer

Question
1. What are your enterprise target segments?
2. What sustainable packaging solutions does your enterprise offer? How does it appeal to food safety and health standards?
3. What trends have you noticed in Latvia food manufacturer packaging sustainability?
4. Are there any large disparities in sustainable packaging demand with regards to enterprise target market geographical location, food sub-sector, or enterprise size?
5. What factors determine choice to implement sustainable packaging?

Source: compiled by author

Interviews were then transcribed and analysed. Firms in sample were compared with each other and factors specific to their sub-sector. To obtain better results, interviews were conducted anonymously. To protect the identities of the firms, they were numbers:

- Company 1's is a family enterprise with main activities being grain growing and processing (50%) and ecological handmade bread baking (50%) offering packaged products to major Latvian retailers
- Company 2 is a family run bakery offering package-free products and packaged products to major Latvian retailers
- Company 3 is a retail and on-demand home producer of baked goods with business activities carried out locally using mostly ecological ingredients and sustainable packaging as part of brand identity
- Company 4 is a is explicitly sustainable niche (coffee) micro enterprise offering package-free products, implementing refillable packaging retail and deposit wholesale system
- Company 5 is large meat processor implementing sustainable packaging in a niche product line, following market trend, but largely using unsustainable packaging
- Company 6 is large meat processor having implemented niche sustainable packaging and viewing it as currently burdensome and labour-intensive activity for large-scale producers

- Company 7 is a seafood canning processor implementing sustainable packaging as means for reduction of transportation costs un-intentionally, but fully complying with retailer demands and planning future packaging updates that would make it less sustainable to appeal consumers visually
- Company 8 is dairy manufacturer operating in retail with mostly refillable primary packaging (package-free products) and transport-package deposit system (60%) and in wholesale with packaged products only (40%)
- Company 9 is sustainable ecological spice and speciality canned product home producer operating in retail and wholesale to niche stores, and having implemented packaging return system within enterprise

2.2 Findings on Sustainable Packaging Adoption Determinants in Latvian Food Sector

The author now summarizes the main factors determining decision to implement sustainable packaging in Latvian food manufacturer enterprises.

From the previous literature overview, 5 main themes emerged, hence:

1. *Resource* factors –both financial and human capital
2. *Technological, informational, awareness* and organizational structure factors
3. *Supply chain* factors
4. Consumer *market* awareness and willingness to pay
5. *Institutional* factors – regulations, tax incentives or services, as enterprise consulting

Regarding internal determinants of Latvian food enterprise sustainable packaging adoption (table 7), the most important was the resource theme, either directly (internal costs: labour and packaging material, or initial investment into equipment) or the return (market demand and willingness to pay, followed by other factors.

Companies 1, 2, 3 & 5 regarded the higher sustainable material cost as the predominant factor, especially important in food sectors using plastic (such as bread, meat,

dairy). For example, direct resource costs (more expensive packaging material, additional labour) and dumped production costs were determining the choice for Company 2, and the lack of market awareness and willingness to pay (external determinant traced back to resource recovery) for sustainable packaging were forming the decision.

As for compliance with previous studies, the initial cost of instalment for new equipment was also found to be an important determinant in the previous literature, but not the human resource and raw packaging material costs. This may be due to the fact that the previous literature was empirically focused on large production enterprises which outsource the packaging entirely, and do not have a distinct packaging unit. Regarding other ways of more sustainable packaging material obtaining (from secondary sources), the enterprises saw the cost of packaging material a cost-increasing factor only, largely not considering long-term cost savings resulting from sustainable packaging practices and systematic implementation.

Initial investment into new packaging equipment (in the case of Company 5 and Company 6) were another important consideration, which is, however, limited to certain time period until the next equipment buy-in. In small enterprises, such as Company 2, 3 & 9, initial investment into equipment is not relevant due to the manual labour in packaging, but human resource expenses are considered. The resource results only partially comply with the relevant research done in this field before; although material cost recovery possibilities are recognized in sustainable manufacturer Company 4, operational cost savings is not a sufficient determinant to turn to sustainable packaging; in large enterprises as Company 5, 6 & 7 sustainable packaging is regarded as a premium product, presumably due to lack of awareness of sustainable packaging materials and the newest food packaging technologies, and the higher price for everyday products.

Medium sized enterprises with refillable deposit system and full control over transportation via secondary packaging (Companies 2, 4 & 8) and retail activities (Company

8) operating domestically saw the cost efficiency on transportation packaging to be determining the choice for sustainable packaging. However, scaling of such system is recognized as problematic when exporting and covering larger geographical business activity area due to perishing and intermediary quality assurance risks.

Smaller manufacturers, as Company 1, 2 and 3, due to manual labour and easier switching between product lines do not recognize initial investment important, and only sees the same material packaging varying in price. This is not in line with other studies, which emphasize the cost saving advantages recognized by large enterprises across different food sectors (Frederick & Elting, 2013), however, with an exception of the meat sector in particular (Grekova, Bremmers, Trienekens, Kemp, & Omta, 2014). It must be noted that generally, none of the food manufacturers in sample did not design product and system together with the package, except for Companies 4&9, which may be the reason for the high switching costs and inability to seek radically different packaging serving primarily the functionality and the needs of the product.

Another factor related to cost recovery was the risk in brand awareness in case of packaging complete abandoning or re-design, found in Company 1. It complies with findings of Gustavo, Pereira, Bond, Viegas and Borchar (2018), who recognized the fluctuations of sales in smaller enterprises to be a negatively determining factor to packaging redesign.

Regarding other internal determinants, the literature puts emphasis on information availability, technology availability and awareness of the company' s management. The most important factors found under this theme were availability of information and technological solution. The information availability to enterprises is extremely important, and it is more crucial in Latvia food sector than in found in previous literature on samples of New Zealand companies, for example. This may be due to the lack of human resource and dedicated research units even in medium-sized enterprises, and the difference in sectors. However, the

differences in sectors (meat and bread in sample) and previous studies (dairy and vegetables) are likely to have less influence than the size of enterprise and the employee dedication and allocation to certain development projects. As recognized by Company 5 employee, "*there is no time to evaluate all the new information from the existing packaging suppliers, let alone to research other opportunities*" (Company 5, personal communication, April 24, 2019).

Although information was recognized to be an important factor due to the lack of human resources, author assumes the importance of information availability to be crucial specifically because of the internal packaging unit and management carrying out and planning packaging activities, rather than outsourcing it to another supply chain part.

As for technological solutions and availability of new, innovative packaging, information of such packaging, and organizational structure, employee and manager awareness of sustainability issues theme as internal determinant of sustainable packaging adoption, the main drivers in small enterprises turned to be the determination of manger-owner. It is the case with Company 3, 4 & 9, and such motivation from management seems to be pre-determining the information availability or sourcing, and technological solution sourcing. Citing a founder of sustainable packaging using company, "*as an industry, the packaging industry is developing [to be more sustainable], but with these [referring to specific packaging type adapted to the company's needs], you have to show initiative yourself*" (Company 4, personal communication, April 24, 2019). Information availability and dissemination in sample was found to be the single most important determinant, with almost all enterprises lacking sufficient information and knowledge on the packaging solutions that provider could offer. It was also the factor emphasized by all but the Company 4 which had made its business goal to be sustainable. Thus, we may trace back the interlinkage between dedication of manager and organizational alignment towards sustainability to be significant factor as well, as none of the other companies were initiating

the information acquiring, unless it was required by cost reduction or new visual design needs (as told by Company 2, 7 & 5). This is in line with the previous research done by Lindh, Olsson, & Bertoluci (2011) and Frederick and Elting (2013) who emphasized the manger awareness and flat hierarchical structures to aid in all-level organization awareness of the environmental goals, which in turn positively influenced organizational move towards sustainable packaging.

Summarising internal factors, one can conclude that the hierarchy of determinants complies with the previous of financial resources but differs with regards to operations and main sector. The internal management awareness is the underlying and predetermining factor further leading to information and technology availability (at acceptable cost) as determinants.

There are several themes and problems that emerged from internal factor interrelation. First, companies which obtained information about packaging solutions and changed in exhibitions (Company 1 & 6) were also more aware of the need for a change. Second, the internal management awareness lead back to the lack of information about sustainable packaging supply, possibly suggesting the company employee's motivation to become more sustainable, but lack of top manager dedication and resource allocation (labour, as recognized by Company 5) and therefore, unavailability of technology.

Second, the scalability problem of established systems emerged. Highly sustainable packaging implementing Companies 4, 8 & 9, as well as package-free retailer recognized the dilemma between product perishing and lack of packaging, implemented with refill and deposit systems in these companies, and was tackling the issue of how to scale activities while maintaining quality of the product while expanding outputs and exporting outside domestic Latvian market.

As for external factors, the shelf life was the underlying theme in all food manufacturer company interviews, which was not corresponding with the packaging provider Company 11 representative, who acknowledged the pressure from large foreign retail chains, such as *Lidl*, *Tesco* and *Aldi*, to be the single most important determinant in food manufacturer choice to use biodegradable, recycled or otherwise sustainable packaging. Due to the local market unawareness, such pressures with regards to sustainability incentives by retailer chains were not noticed, as sample firms do not engage in business with *Lidl*, *Tesco* and *Aldi*, and the domestic retailers do not impose strict sustainability policies. Among domestic retail chains, the most important sub-theme were shelf-life and legal (etiquette) factors, with shelf life as a competitiveness undermining factor cited all companies distributing its products via major food retailers. Most companies (except company 7 whose sales are mostly in exports) have the largest distribution through the chain retailers, and therefore refers to distributor requirements and power as one of the most important, as important as the cost of the packaging, and would change the packaging to more sustainable one if required and pressured. These findings also go in line with the previous research by Gustavo, Pereira, Bond, Viegas, and Borchar (2018) who saw the pressure from retail chains to push packaging providers come up with sustainable solutions, therefore positively determining the primary packaging, as well as Lindh, Olsson and Bertoluci (2011) who found the lack of such pressures to negatively influencing producers and manufacturers sustainable packaging implementation.

The market demand was not the most important theme, but the customer willingness to pay was mentioned as one of the top concerns when investing and implementing the higher-priced sustainable packaging by most companies, concerned about the market demand, and valuing of a more sustainable packaging for fast-moving consumable goods (Company 2, 5, 6), as opposed to the niche products manufacturers (Companies 4 & 9;

partially 3). As Company 4 operates in niche market, the brand identity was one of the main factors as well, just as Company 3 & 9. It also appeared to be an important theme in companies and sectors where technological solution is either less complicated, or where management is environmentally aware and motivated to become more sustainable. However, none of the brand identity-concerned enterprises do not explicitly communicate the sustainable packaging advantages. None of the companies were explicitly investing in *green* consumer marketing; reusable packaged products were rather positioned as a mid-level to premium class product, compared to the other products in production. This is not in line with the previous findings, where the enterprises in question differentiated product lines in order to appeal to sustainable consumer needs and communicate mission and vision explicitly (Frederick & Elting, 2013) also benefitting from targeted *green* consumer marketing (Lofthouse, Bhamra, & Trimingham, 2009). Also, re-fillable packaging in literature refers to customer lock-in as a marketing strategy for stable demand and increased sales, but interviewed companies implementing refillable packaging systems did not see it as relevant, admitting that "*it is great that they come back, but it is not the main goal; we are happy if they use the package again to buy not only coffee, but for also rice or buckwheat*" (Company 4, personal communication, April 24, 2019). Thus, one can conclude that either Latvian market is not large or mature enough for sustainable marketing to appeal to consumers, or such efforts are not in line with the brands' identities.

The external factor theme, institutional factors, were, as recognized in the previous research works, not determining the choice to implement green packaging. Instead, health and safety standards are already embedded into the commercial function of the product, and is not seen as limiting, because enterprises are pre-occupied with distributor requirements ensuring longer shelf-life and thus increasing competitiveness. The health and safety requirements are needed to comply with and are of the commercial interest, irresectable to the

greenness of packaging. As for government tools, the upcoming taxable disposable plastic packaging is not determining the choice, and rather brings awareness, raises discussion in large firms (Company 6) about future government incentives and motivates to look for a more sustainable packaging solutions. It partially collides with findings by Grekova, Bremmers, Trienekens, Kemp and Omta (2014) who recognized the EU directives to be less influential, but (in contrast to these findings) found the health and safety requirements to drive the implementation of sustainable packaging.

In summary, Company 4 has the most advanced approach to sustainable packaging, driven by its embeddedness as a core value in the brand identity, as well as integrated design and the long shelf life of the product allowing for less concern over the determinants which other food manufacturers faced, especially those in similar positioning strategy, as Company 3. The systematic strategy and flat hierarchy allow for owner-manager to variate the packaging.

Companies 1, 2 & 3 are supportive, open to and aware of sustainable practices, and their core products have similar quality and ecological, sustainable brand identity, as well as the low hierarchy and manual labour allows for eased switching to sustainable packaging, given the information and cost advantages are found and the product comply with shelf-life requirements. This is largely the case with meat sector as well, but the switching cost and initial outlay would be much higher due to mechanized production lines requiring new equipment. The overall findings comply with those of previous researches, with some exceptions, for example, the resource (financial) theme is seen almost exclusively as a barrier, the supply chain pressures, the environmental covenants are not present in Latvia, and the explicit sustainable packaging marketing is not being implemented for the medium-priced product lines.

Largely, the main factors are related to the resources, either directly (internal cost) or the return (market demand and willingness to pay); the institutional factors are largely irrelevant, but awareness and technological factors are important, presumably because of the lack of resources and separate departments for development dedicated to information research.

Table 7.

Sustainable packaging determinants in food sector manufacturing enterprises in Latvia

Company	**Resources**			**Awareness & Tech**			**Supply chain**			**Market demand**		**Institutions**	
	Human resource	**Initial investment**	**Material cost**	**Informational**	**Technology availability**	**Top management awareness**	**Shelf – life**	**Legal functions**	**Sustainability incentives**	**Willingness to pay**	**Branding**	**Tax changes**	**Food safety**
1			X	X			X				X		
2	X		X	X			X	X	X	X			
3			X	X		X					X		
4					X	X					X		
5	X	X	X	X			X			X			
6	X	X		X	X		X			X		X	
7		X	X		X					X			
8						X	X						
9	X	X	X			X	X						
10			X			X			X	X	X		
11				X			X		X	X	X		

Source: compiled by author

Conclusion

In this research, the author looked at factors determining the implementation of sustainable packaging in food manufacturing enterprises in Latvia.

To answer the research question and list the main determinants, the theoretical framework of sustainable packaging was set, based upon available literature. Sustainable safe, cyclic and efficient packaging in food enterprises **aims** to achieve the least harmful for environment and people, while complying with economic enterprise and social public aims, and is achieved by 4R1D model of packaging reduction, reusing, recycling, reclaiming, and design using biodegradable. For enterprises, it is means for achieving competitive advantage, especially in environmentally aware consumer markets, with the main determinants for sustainable packaging implementation being resource availability, technological availability and manager and employee awareness (internal determinants), and supply chain stakeholder power, market demand, and institutional factors (external determinants).

In the empirical research, author interviewed Latvian food manufacturer companies and found the most important determinant arising from resource theme (financial resources; economic perspective), followed by supplier chain power theme (competitiveness between suppliers to large chain stores with shelf-life of the product), and informational and awareness theme (information availability and manager, employee and overall company awareness of the sustainable development goals). Marketing and brand identity is an important determinant for small enterprises, although not always realised to the fullest.

Industry, company scale and hierarchy seem to play an important role, due to the cost considerations in sectors which are highly mechanized, as well as the company play a role. Collaboration with sustainable distributors and packaging providers may also play a crucial role in mitigating the problem of lack of information.

This research is not aimed to represent the Latvian food manufacturing industry and cannot be generalized to other enterprises. Due to the partial lack of representativeness of the sample, future research would be beneficial to explore organizational awareness determinants and information availability more in depth, as the author acknowledges these to be the most unexplored and provide insights about the informational and partnership linkages of packaging providers to manufacturers, proposing solutions for more tangible approach to aid sustainable packaging implementation in large enterprises operating in consumables industries.

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