A System Dynamics Model of Supply and Demand in Thrift Stores

Using a System Dynamics lens to look at the underlying dynamics that facilitate reuse

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Abstract

This research examines the supply and demand in thrift stores, in order to provide knowledge on the influences on reuse of used goods. In this thesis, supply consists of donations and, occasionally, bought-in goods, and demand focusses on the sales of these used goods. By providing an initial, overarching model, this research gives insight in how influences on supply or demand interact and, thereby, drive the supply and demand. A conceptual model was formulated based on previous insights from scientific literature. Hereafter, in order to build confidence in this model, semi-structured interviews and a document analysis have been conducted. After analysing the data, a revised model was presented, in which the endogenous and exogenous factors and five feedback-loops influencing the supply and demand in thrift stores are visualized. It is found that thrift stores have a limited ability to influence the donations themselves. Some stores try to overcome this by buying in goods. Thrift stores can focus their attention to optimizing the demand of second-hand goods. Sales can be influenced more directly, and selling more second-hand goods, can contribute to reuse as well. For further research, it could be interesting to look into ways thrift stores can influence supply directly, or validate this model even further by including donors or buyers as respondents or quantifying this model.

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1. Introduction

Global warming is a worldwide threat and the consequences, including climate change and economic inequality, are getting more and more visible (Diffenbaugh & Burke, 2019; NOS, 2019). The emission of greenhouse gases (GHGs) from human activities has a large impact on global warming and should be mitigated to interfere less with the climate system (OECD, 2021). Manufacturing industries are assumed to generate 12% of GHG emissions and, as such, are the second-largest contributor (OECD, 2021). Scholars often suggest that recycling and reuse can contribute to reducing the environmental burden of goods, since it reduces virgin material consumption and extends product-life. Research has also shown that reuse is more beneficial towards reducing the environmental burden than recycling (Sandin & Peters, 2018; Farrant et al, 2010; Thomas, 2003, 2011; Ellen MacArthur Foundation, 2013; Korhonen et al, 2018). However, reuse and the effects of reuse on the environment and economy, are seldom studied (Delanoeije & Bachus, 2020).

One of the main facilitators of reusing goods, are thrift stores (Delanoeije & Bachus, 2020; Lane et al, 2009). Thrift stores are non-profit organizations that collect (and sometimes repair) reusable goods to resell as second-hand goods (Montgomery & Mitchell, 2014). In 2019, for instance, Dutch thrift stores have collected 150 million kilograms of goods of which 46% was resold in stores. After processing these 150 million kilograms of goods, thrift stores saved 130.000 tonnes of CO_2-emission (BKN, 2020). In addition, thrift stores offer employment for people with a distance to the labour market and provide goods at relatively low prices for low-income households (Delanoeije & Bachus, 2020). Thrift stores engage in these activities in order to support their environmental and social goals (Mitchell et al, 2009; Mitchell & Montgomery, 2010).

In order to facilitate the reuse of goods, thrift stores need goods to resell. The supply of goods for thrift stores is different from production companies, since thrift stores usually do not manufacture new products themselves. The supply exists mainly of donations from individuals or companies, of which quality and quantity differ daily (Han, 2013; Montgomery & Mitchell, 2014) and sometimes include bought-in goods as well (Mitchell and Montgomery, 2010). The demand for second-hand goods determines whether or not goods are actually getting sold and reused. On the one hand, if the supply of second-hand goods exceeds the demand, goods will remain unsold, and thereby, will not be reused (Delanoeije & Bachus, 2020). On the other hand, if the demand of used goods transcends the supply, there could be an increase in the demand for new goods, since there are not enough second-hand goods to

fulfil the demand. This would increase material consumption again, instead of reducing it (Thomas, 2003). In order for thrift stores to optimize the contribution to the environment via reuse, it is required to have a certain balance between supply and demand. Therefore, it is interesting to look at the way supply and demand of goods in thrift stores come about and especially if thrift stores can influence this balance.

According to Whelan, Msefer and Choge (2001, p.6) the classical economic perspective provides a relatively static model of supply and demand. This model is based on the manufacturing or purchase price a manufacturer or customer would have to pay (Whelan, Msefer & Choge, 2001), and assumes that price is the primary (and often only) determinant to the quantities supplied and demanded (Inman et al, 2020, p.373). However, research on buying behaviour in secondhand markets has revealed that not only economic motivations play a part in the demand for goods in thrift stores, but environmental and hedonic considerations as well (Bardhi and Arnould, 2005; Mitchell & Montgomery, 2010). Besides, thrift stores do not have the luxury to decide how much to produce of a certain product, but depend on the varying donations they receive (Mitchell et al, 2009; Han, 2013). Therefore, this approach is not suitable. In addition, the classical economic perspective on supply and demand looks at a singular relation between the quantity of goods supplied or demanded and the price, but this view is not all-encompassing for thrift stores. Prices in thrift stores are not depending on manufacturing prices, but are, among others, based on the condition of goods, the previous donations and storage space (Bardhi & Arnould, 2005; Mitchell & Montgomery, 2010: Machado et al, 2019; Whelan et al, 2001). Moreover, these diverse variables do not only influence the price of goods in thrift stores, but affect other variables, such as the attractiveness of the store, as well.

Because thrift stores face diverse connected influences on their supply and demand, thrift stores can be seen as complex systems. "Complex systems are composed of elements or agents that are of many different types and that interact in different ways" (Cameron & Larsen-Freeman, 2007, p.3). More importantly, these elements and the way they influence each other can change over time (Cameron & Larsen-Freeman, 2007). It is useful to look at the supply and demand in thrift stores in a holistic way, to create a better understanding of the way supply and demand are influenced and can facilitate reuse (Sterman, 2001; Ellen MacArthur Foundation, 2015).

Two methods that are suitable for researching complex systems are System Dynamics and Causal Mapping. However, Causal Mapping tends to focus on mapping a specific situation

and the mental models participants have, instead of aiming for a general model (Williams et al, 2003; Ackermann & Alexander, 2016; Laukkanen, 1998). The aim of this research is to provide an overarching model, which is not only applicable to the organizations at hand, but offers a more general use. System Dynamics is suitable for depicting (general) complex systems and obtaining holistic knowledge (Sterman, 2001), which is currently missing on the supply and demand in thrift stores. Therefore, this research follows a System Dynamics approach.

In order to understand the behaviour of complex systems, System Dynamics uses the notions of stocks and flows (Meadows, 2008). Stocks and flows refer to the accumulation and dispersal of resources (Sterman, 2001, p.14). Stocks are the elements of the system that you can measure at any given time, such as a quantity or accumulation of goods, but these can only change via flows, either in-flows or out-flows (Meadows, 2008). The dynamics of stocks and flows could be influenced by feedback-loops. Feedback-loops can be balancing or reinforcing. A balancing loop stabilizes the stock level, and a reinforcing loop enhances the direction an initial change that is imposed on the loop (Meadows, 2008, p.31). When looking at the internal structure of a complex system, there often are relations between different variables that form a closed loop (a feedback-loop), in which a change in variable A, can lead to a further change of A via other variables (Forrester, 1994; Király & Miskolczi, 2019). Feedback can be seen as the fact that results of actions have an influence on the future situation, due to systems interacting with their changing behaviour (Sterman, 2001). Hypothetically, if a thrift store is in need of a certain product, they can choose to buy this item. After buying this item, this product is available, which decreases the need for this item again. The absence of need, results in thrift store employees not buying the item again. Buying new goods can thus influence itself, via the need for a specific product.

Not only feedback-loops can influence the in- or outflows of stocks. Since not all influences form a closed loop, it can also be useful to look at other variables that might cause a change in dynamics. Richardson (2011) argues that System Dynamics tends to look and explain endogenous sources which explain the dynamics of a complex system. However, he points out that not all influences are within control of the system itself. Some variables are exogenous, and cannot be influenced by the internal structure of a system (Richardson, 2011). The dynamic mechanisms looked into in this thesis are feedback-loops, endogenous and exogenous and variables, while using a stock and flow structure.

1.1 Research objective and question

The research objective of this research is to contribute to knowledge about the influences on reuse of used goods in thrift stores, by giving insight into the dynamic mechanisms that lay at the basis of supply and demand of goods in thrift stores. In order to achieve this, the following research question will be answered:

What dynamic mechanisms lay at the basis of the supply and demand of used goods in thrift stores?

1.2 Theoretical and societal relevance

This research is socially relevant since reuse is more beneficial than recycling for the environment (Sandin & Peters, 2018; Ellen MacArthur Foundation, 2013). In order to support thrift stores to contribute to the reuse of goods even more, it is interesting to visualize the way thrift stores facilitate reuse and how they can influence the (balance between) supply and demand. In turn, this could be used by thrift store employees to adapt their policies, if necessary, to optimise their contribution to the reuse of goods. In addition, this research is theoretically relevant as well. Little research has been done on reuse (Delanoeije & Bachus, 2020). Moreover, this research aims to provide an initial overarching model, in which the dynamics of supply and demand are captured. Instead of solely focussing on gaining knowledge of a separate aspect of supply or demand, such a model combines previous insights into a whole system of interlinked influences. By looking at reuse from a System Dynamics perspective, new insights can be provided compared to traditional research, which focusses on a relative isolated relation between two variables (Sterman, 2001). This research aims to contribute knowledge by both re-examining previous insights and by combining those to gain new knowledge on their relations and dynamics.

1.3 Thesis outline

This thesis is structured as follows. In Chapter 2 the theoretical framework that is used for this research is explained. The core concepts of this research, including thrift stores, supply and demand, will be defined and elaborated on, after which a conceptual framework is proposed based on scientific literature. This framework tries to explain the ways in which the concepts of supply and demand in thrift stores are influenced and influence themselves. Chapter 3 focusses on the methodological choices that have been made for this research, including the research strategy, plan for data collection and analysis and research ethics. The analysis and results will be discussed in Chapter 4, followed by the conclusion and discussion in Chapter 5.

2. Theoretical background

This chapter describes the central concepts in this thesis, which are reuse, thrift stores, supply and demand. These core concepts are used thereafter to propose a conceptual model in a step-by-step way, to explain the underlying dynamic mechanisms of supply and demand in thrift stores.

2.1 Central concepts

2.1.1 Reuse

Within the circular economy, there are different strategies developed to minimise waste, such as reuse, repair, refurbish and recycle (Hansen & Le Zotte, 2019; Reike et al, 2018). Whereas recycling has received the most attention, it is often indicated that reuse is a more beneficial strategy (Sandin & Peters, 2018; Farrant et al, 2010; Thomas, 2003; Thomas, 2011; Ellen MacArthur Foundation, 2013; Castellani et al, 2015; Korhonen et al, 2018). Reuse is more beneficial since the savings with regard to resources, energy, labour and capital are higher in comparison to recycling, disposal or the manufacturing of new products from virgin materials (Ellen MacArthur Foundation, 2013). A possible definition of reuse is: "*the use of a product again for the same purpose in its original form or with little enhancement or change*" (Ellen MacArthur Foundation, 2013, p.25). Reuse can also be defined as the use of a product "*by another consumer of discarded product which is still in good condition and fulfils its original function*" (Kirchherr et al, 2017, p.224). In the Waste Framework Directive (Europa Decentraal, n.d., p.8), reuse is defined as: "*any operation by which products or components that are not waste are used again for the same purpose for which they were conceived*". These definitions are rather similar, except for the definition of the Waste Framework Directive (Europa Decentraal, n.d.), which explicitly states the use of components as well. Since goods in thrift stores practically exist of whole products, this definition is not used for this research. The definition of the Ellen MacArthur Foundation (2013) is leading in this research, but the aspect of discarded goods is added, due to the focus on practices within thrift stores. Therefore, in this research, reuse is defined as: "*The use of a discarded product again, for the same purpose in its original form or with little enhancement or change*".

The reuse of goods can contribute to a more sustainable society, since it extends product-life. Product-life is "*the period over which products and goods are used*" (Stahel, 1982, p.72). By extending product-life, it is assumed that less new products have to be produced, since buying used products replaces buying new goods. In addition, the used goods do not have to be disposed. This reduces depletion of natural resources and waste (Thomas, 2011; Stahel,

1982). Shortening product-life would result in an increased demand for new goods, which would result in more waste and use of virgin materials (Stahel, 1982). Reuse is especially suitable for goods with the highest environmental impact during the extraction and production phases, in contrast to the usage phase, such as furniture and interior design products (Berlin, in Edbring et al, 2016).

However, it can be contested to what extent buying used goods substitutes buying new goods (Thomas, 2011). Only if consumers do not buy something new, but second-hand instead, this would have a positive impact on the environment. This is not the case if people buy second-hand goods, which they otherwise would not have bought at all. The latter could be since products are relatively cheap compared to new goods (Bardhi & Arnould, 2005; Delanoeije & Bachus, 2020). Moreover, second-hand sales could also increase first-hand sales, since owners of new goods could sell their used goods more easily. This gives the owner the opportunity to receive part of the spent money on the newly bought good back. As a result, the owner has more budget to spend, which can result in buying new goods again. If someone uses the selling of previously bought first-hand goods, to replace these goods earlier than otherwise would have been the case, this would have a negative impact on the demand for first-hand goods and in turn on the environmental burden (Fox, 1957).

Reuse is facilitated through various channels. Reuse may occur through formal channels such as thrift stores that are affiliated with a branch organization and private second-hand shops, or in informal ways such as online platforms, second-hand fairs, or via family and friends (Delanoeije & Bachus, 2020). Galama (2019) found that thrift stores are the biggest formal reuse channel, and Lane et al (2009) found that second-hand shops were favoured over the internet for the purchase of second-hand household goods.

The insights on reuse and thrift stores can be visualized in a (partial) model, a Stock and Flow Diagram, such as the partial model in Figure 1. In the following models through-out this thesis, stocks represent accumulations, which characterize the state of the system. Flows represent in- and outflows, which cause a system to change (Sterman, 2000, p.192). In this model, the stock is *reused goods*, and the flow is the *inflow reused goods*. The amount of reused goods is determined by the inflow of reused goods. In turn, this inflow is depending on the *demand for second-hand goods*, since second-hand goods that are not bought, are not reused. As can be seen in Figure 1, the relationship between *demand for second-hand goods* and *inflow reused goods* is positive, indicated by a plus (+) next to the arrow. A positive relation means that if the first variable increases (or decreases), the variable it influences,

moves in the same direction, so increases (or decreases) as well. In this case, if the *demand for second-hand* decreases, *the inflow of reused goods* decreases as well and vice versa. A negative relation (-), for instance the relation between *demand second-hand goods* and *demand first-hand goods*, indicates an inverse effect. If the *demand for second-hand goods* increases (or decreases), the *demand for first-hand goods* decreases (or increases), since people normally do not buy something twice, both new and second-hand. A first feedback-loop can be identified here, since *demand for first-hand* and *second-hand goods* influence each other. However, the *demand for first-hand goods* is not only influenced by the *demand for second-hand goods*. This demand is also influenced by the *level of substitution*, which entails the extent to which buying second-hand goods replaces the need to buy first-hand goods (Thomas, 2011). However, the *inflow of reused goods* is not a generic phenomenon, but comes in multiple shapes and sizes and depends on multiple factors as well. Therefore, it is useful to zoom in and elaborate on (the inflow of) reused goods. This is done according to the other three core concepts: thrift stores, supply and demand.
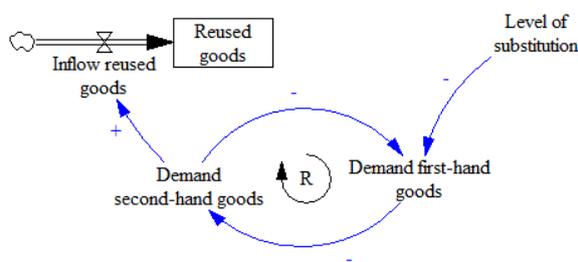
Figure 1. Partial model Reuse

2.1.2 Thrift stores

Thrift stores (or thrift shops, second-hand shops or charity shops) can be defined as: "*stores that actively seek donated merchandise to be sold in their retail outlets*" (Mitchell & Montgomery, 2010, p.94). Blume (as described in Parsons, 2002, p.589) defines thrift stores as: "*a shop which sells donated goods where the profit is used for charitable purposes*". This thesis follows the definition of Mitchell and Montgomery (2010), since the focus of this thesis is on the reselling of goods, and not on the purpose of selling goods. However, the stipulative definition of thrift stores is slightly adjusted, since this research will only focus on non-profit thrift stores that are affiliated with the Dutch branch organization for thrift stores, the Branchevereniging Kringloopbedrijven Nederland (BKN). This selection is made, since affiliated thrift stores are non-profit, have environmental goals and possess more detailed data on their proceedings (BKN, n.d.a; BKN, 2020). Therefore, in this research, thrift stores are

defined as: "*second-hand shops that actively seek donated merchandise to sell from a non-profit perspective, that are affiliated with the branch organization BKN*".

Thrift shops have several functions, such as providing merchandise for low-income shoppers, supporting employment and reselling or recycling goods (Mitchell & Montgomery, 2010; Montgomery & Mitchell, 2014; Delanoeije & Bachus, 2020). Thrift stores receive 77% of their income from selling goods in stores, 7% of their income results from bulk sales and 16% due to services, including subsidies for the collection of used goods and employing people with a distance to the labour market (BKN, 2020). This illustrates the importance of selling second-hand goods.

However, thrift stores face different challenges than other retail stores, since they have to compete for both donations and selling goods at the same time. It is found that these are often not the same target markets (Montgomery & Mitchell, 2014; Croft, 2003) and that they must compete for local custom in terms of quality, price and variety (Croft, 2003). The competition thrift stores face is diverse. On the one hand thrift stores have to compete with other non-profit thrift stores and for-profit second-hand shops for both donors and buying customers (Mitchell & Montgomery, 2010). On the other hand, thrift stores have to compete with traditional retailers (Mitchell & Montgomery, 2010) and cheap retail stores, such as the Primark and Action, since they target low-income households as well (Delanoeije & Bachus, 2020). Yet, the popularity of second-hand goods is increasing (Galama, 2019). Second-hand retailers are able to compete with traditional retail outlets, and satisfy expectations that traditional retailers cannot, due to its fair prices, ethical behaviour, environmental concerns and the recreational benefits thrift stores offer (Galama, 2019; Guiot & Roux, 2010). For instance, thrift stores offer opportunities for finding unique items or items that are no longer available in the new goods market (Guiot & Roux, 2010).

It can be said that the main goal of a thrift store, regarding reuse, is to acquire and sell donated goods. However, this process is complicated by the competition thrift stores face. Thrift stores face competition for receiving donations, and, at the same time, for selling used products. This is visualized in Figure 2.
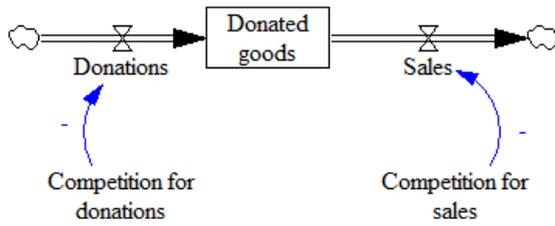
Figure 2. Partial model Thrift Stores

2.1.3 Supply

Traditional economics define supply as: "*the amount of goods a producer is willing to produce at a given price*" (Investopedia, 2018). Supply can also be defined as: "*how much of a good or service is offered at each price*" (Whelan, Msefer & Choge, 2001, p.10). However, this thesis focusses on second-hand goods and not services and thrift stores do not produce products themselves (Mitchell et al, 2009). Therefore, these definitions are not suitable. There are multiple ways that thrift stores do receive goods. Thrift stores could receive donations of second-hand goods from individuals, new goods from stores that may be liquidating merchandise and sometimes resort to buying new goods, such as crafts, pottery and jewellery (Hoang, 2015; Montgomery & Mitchell, 2014; Parsons, 2002 in Mitchell & Montgomery, 2010, p.95). The main source of goods stem from individual donations, of which quantity, quality and variety differ daily (Hibbert et al, 2005; Croft, 2003; Han, 2013). Therefore, in this research supply is defined as: "*the quantity, quality and variety of incoming goods to thrift stores*".

There are different motivators that influence whether people donate goods to thrift stores. There are certain events that prompt consumers to dispose of goods, such as clearing out, purchasing of new or replacement goods, and tax incentives. In addition, disposal routes vary according to the type of goods disposed (Hibbert et al, 2004; Fortuna & Diyamandoglu, 2017). According to BKN (2019), over 50% of donations is dropped off at thrift stores by individuals. Other donations are picked up at peoples' homes, dropped off at textile containers or brought to recycling centres. Therefore, the supply of goods in thrift stores depends to a large extent on donors. Mitchell et al (2009) found that reasons for donating stem from self-interest or altruistic behaviour and that self-interest trumps altruism. Self-interest entails reasons such as seasonal cleaning and the need to free up some space, or to feel better about oneself (Mitchell et al, 2009; Bianchi & Birtwistle, 2010). Altruistic reasons for donating goods are the desire to help others (Mitchell et al, 2009), responding to a request (Hibbert et

al, 2005) and general recycling behaviour out of concern for others or the environment (Bianchi & Birtwistle, 2010).

Not only motivations determine people's propensity to donate. Psychological characteristics of the decision maker, factors intrinsic to the product and situational factors extrinsic to the product influence the way people dispose of goods as well (Jacoby et al, 1977). Psychological characteristics can entail attitudes, emotions, intelligence and social class (Jacoby et al, 1977), but also demographics such as gender and age (Mitchell et al, 2009). Bennett (2003) found that donations increase with age and Mitchell et al (2009) found that women tend to donate more often than men. Product characteristics entail the condition, age, size, style, and value of the good (Jacoby et al, 1977). When choosing the way to dispose of a good, the value a product still has in the eyes of the donor plays a significant role as well. If people perceive the value of a product to be high, they rather sell it (Fortuna & Diyamandoglu, 2017), or give it away to friends or family (Bianchi & Birtwistle, 2010), than donating it to a thrift store. In addition, in harsh economic times, people also tend to donate less. Rather than donating goods, people either hold onto the item longer or try to sell it (Glover, as described in Montgomery & Mitchell, 2014). Other situational factors entail urgency (the calling for immediate attention (Merriam-Webster, n.d.)), fashion changes (Jacoby et al, 1977), mode of ask, competition for donations and convenience of donating logistics (Mitchell et al, 2009). Fortuna and Diyamandoglu (2017) found, for instance, that donating to thrift stores was the preferred method for disposal of books and clothing, but that the donations of furniture is limited due to transportation issues or other signs of inconvenience. Clearly, there are multiple factors that need to be taken into account, when looking at the supply of goods in thrift stores.

It is also interesting to look at the donations itself, since these goods are the main source of income for thrift stores (BKN, 2019). In order to exist, thrift stores need to sell goods and this is influenced by the quantity, quality and variety of donated goods (Wodon et al, 2013). Over time, the amount of donated goods has changed. Whereas thrift stores were concerned about shortages of donated goods around 2000 (Phelan, as described in Hibbert et al, 2005), nowadays thrift stores receive plenty of donations (Galama, 2019). This shows that donations not only differ daily, but that the donated quantity of goods can seriously change over time. However, quantity is not the only factor influencing whether someone will buy second-hand goods in thrift stores.

Another factor to take into account is the quality of donated goods. As pointed out, donors usually sell or give away goods that are of high quality and donate what is left (Jacoby et al, 1977; Fortuna & Diyamandoglu, 2017). This would affect the quality of donated goods negatively (Mitchell et al, 2009). In addition, the amount of goods of poor quality, such as fast fashion garments, is increasing, which causes the need to collect more items to gain a similar amount of qualitative goods (Delanoeije & Bachus, 2020). This causes more strain on the supply of donations. Despite those potential influences, the overall quality of goods Dutch thrift stores receive has been consistent for the last three years, and is scored a 7 (BKN, 2020).

The variety of offered products is a third aspect of donated goods (Han, 2013). Thrift stores try to obtain diverse product types in their assortment, since it targets a larger audience. However, in reality there can be a mismatch between the supply and demand of goods of a certain product type. Some categories of goods are particularly popular, such as washing machines (Lane et al, 2009), living accessories, and kitchen appliances. This often goes hand in hand with too little supply (Galama, 2019). Textiles, on the other hand, tend to be oversupplied (BKN, 2019). Therefore, it is interesting to not only take the quantity of supplied goods into account, but also the quality and variety of supplied goods.

It is useful to visualize the supply of thrift stores, since changes in supply not only affect the potential to reuse goods, but could also threaten the continued existence of thrift stores. Reuse is part of the strategy that thrift stores use to contribute to their environmental goals and is achieved through reselling goods. As pointed out, thrift stores receive their goods mostly via donations, but sometimes resort to buying certain goods as well. This can be seen in Figure 3. Factors that influence donations that are included in this model are *competition for donations, donor motivation, convenience donating logistics* and *economic prosperity*. Moreover, *donations* and potential *bought-in goods* determine the quantity, quality and variety of goods that a thrift store can offer. Factors that are not included in the model are personal characteristics such as gender or age. These influences are not included, because the influence these factors would have on the behaviour of the whole system, is assumed to be similar to the relation of *donor motivation* on *donations*. Since the conceptual model already is quite extensive, including all aspects researched in scientific research, would go beyond the scope of this thesis. However, by adding *donor motivation* to the model, it is attempted to include the general nature of personal characteristics on the dynamics of donations, to not overlook a potentially significant dynamic.
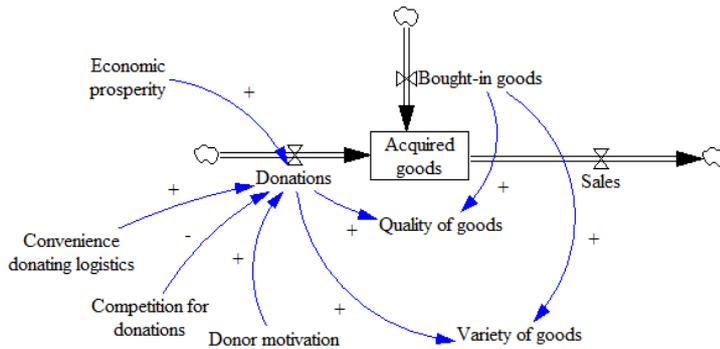
Figure 3. Partial model Supply

2.1.4 Demand

The traditional economical definition of demand is: "*a customer's desire to purchase goods and services and willingness to pay a price for a specific good or service*" (Investopedia, 2021). Demand can also be defined as: "*the quantity (or amount) of a good or service people are willing and able to buy at different prices*" (Whelan, Msefer & Choge, 2001, p.10). However, this thesis does not explicitly research services offered, but focusses on goods. In addition, in thrift stores price is not the only determinant that influences demand (Inman et al, 2020; Bardhi & Arnould, 2005; Mitchell & Montgomery, 2010). In this research, demand is defined as: "*the quality, type and/or amount of second-hand goods that customers are willing to buy in thrift stores*". This definition thereby differs from traditional demand, since it also takes into account quality and variety of goods.

There are four main reasons identified why people buy in thrift stores. The main motivation for people to go to thrift stores is economical. Due to lower prices, people have the opportunity to save money (Mitchell & Montgomery, 2010; Bardhi & Arnould, 2005). The product characteristics of goods in thrift stores are another motivator (Guiot & Roux, 2010), since thrifts stores can fulfil the need for a unique item or item that is no longer available in regular stores (Mitchell & Montgomery, 2010). The experience of hedonic benefits, such as fun, leisure, social interaction, or recreation, is another big motivator for thrift store shoppers (Guiot & Roux, 2010, Bhardi & Arnould, 2005). Hedonic shopping is focussed on satisfying individual desires that go beyond necessity (Bardhi & Arnould, 2005). With regard to thrift shopping, consumers derive hedonic benefits from the realisation of consumer fantasies and the pursuit of the unexpected, or treasure hunt. Due to lower prices, thrift stores allow customers to fulfil desires beyond necessities, that they otherwise would not be able to fulfil (Bardhi & Arnould, 2005). Finally, Guiot and Roux (2010) look at critical motivations. Critical motivations entail the avoidance of conventional channels, ethical and ecological

considerations and anti-ostentation. This can be seen as an environmental motivation to buy second-hand. Machado et al (2019), found that individuals can be motivated by multiple reasons at the same time. Millennials, for instance, find both environmental values and budget allocation driving factors to buy second-hand clothing (Medalla et al, 2020).

Personal characteristics, such as age and gender, as well as characteristics of the thrift store, also influence shopping at thrift stores (Montgomery & Mitchell, 2014). For instance, women are significantly more likely to shop for economic reasons and the search for special items than men (Mitchell & Montgomery, 2010). Montgomery and Mitchell (2014) also found that the number of thrift store shoppers increases with age.

The attractiveness of stores is influenced by multiple factors. Customers value a pleasant store atmosphere highly, which can be influenced by the cleanliness of store and well-organized displays (Mitchell & Montgomery, 2010; Han, 2013). In addition, the quality of merchandise and convenience of the location of a store are also important (Galama, 2019; Mitchell & Montgomery, 2010). Nowadays, customers also expect more and better services and an increasing amount of thrift stores have included fitting rooms, the ability to pay by card and small cafés in their stores (Galama, 2019). However, there are still barriers for people to buy second-hand. Barriers for buying at thrift stores are concerns such as the lack of information about the state of the product and lack of guarantees, which causes a high perceived risk (Guiot & Roux, 2010). Moreover, goods containing soft materials, such as mattresses, sheets or towels are regarded negatively, due to hygiene concerns and/or fear of bringing home pests (Edbring et al, 2015).

With regard to the demanded quantity, quality and variety, can be said that thrift stores and second-hand goods are getting more and more popular (Galama, 2019). BKN (2019) found that thrift stores have more paying customers than the years before, which is in line with an increasing popularity. When looking at the asked quality, people are always looking for high quality goods (Galama, 2019) and are reluctant to buy second-hand goods with clear traces of the previous owner (Edbring et al, 2015). Quality of goods is also important for thrift stores since it influences the revenues (Croft, 2003). This is because thrift stores often price their goods according to the quality and condition of a product (Han, 2013). The demand of goods also differs per product type. For instance, living accessories are very popular, whereas electronics are not, due to their high turnover rate (Galama, 2019). The demand for goods with soft materials, such as matrasses, is also low (Edbring et al, 2015). However, textiles, mostly clothing, do form the main share in store revenues (BKN, 2019).

In order for thrift stores to facilitate the reuse of goods, the acquired goods also need to be sold. Changes in demand of second-hand goods can, therefore, have an impact on the reuse of goods. If demand decreases, stores could acquire a surplus of goods, with nowhere to go. If demand increases, this could result in a deficit of second-hand goods. It is useful to look at the influences on the sales of second-hand goods, in order to understand what drives this dynamic behaviour. In this research, sales is chosen as a representative of the demand for second-hand goods, since it is assumed that sold goods are equal to reused goods. The reuse of goods, which is one of the goals of thrift stores, is thereby determined by the actual sales of goods and not the demand in general.

The *sales* of goods are influenced by a lot of different factors, such as the *quality* and *variety of goods*, the *attractiveness of a store*, offered *prices* and the amount of *concerns* people have, as can be seen in Figure 4. Personal characteristics have not been included in this model since the conceptual model already is quite extensive, and including all aspects researched in scientific research, would go beyond the scope of this thesis. In addition, the influence of personal characteristics on sales is assumed to be of a similar nature of the relation between *buyer motivation* and *sales*. Therefore, by adding *buyer motivation* to the model, it is attempted to include the general nature of personal characteristics on the dynamics of sales, to not overlook a potentially significant dynamic.
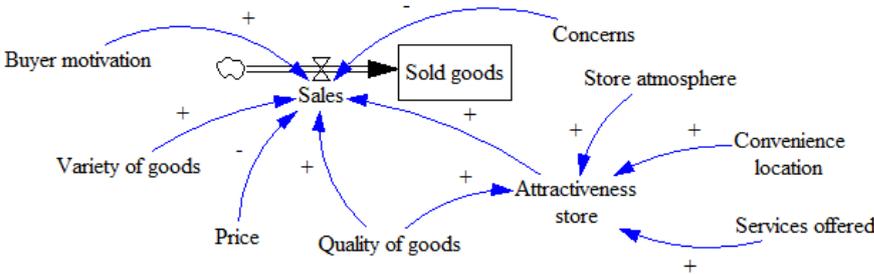
Figure 4. Partial model Demand

2.2 Conceptual model

This research aims to add knowledge to the concepts of supply and demand in a thrift store setting, by connecting and explaining the factors that drive the dynamic behaviour hereof. Based on scientific literature, a conceptual model is made to explain this behaviour (see Figure 12). This model is based on a step-by-step extension of the partial models presented above.

Based on the literature discussed in section 2.1, several partial structures were identified. In order to model the dynamic behaviour influencing the supply and demand in thrift stores,

these partial structures need to be linked and made more specific. The basic structure, based on the aim of thrift stores to resell donated goods (see Figure 2), is elaborated on (see Figure 5) by combining this with the partial structures of the supply and demand in thrift stores (Figure 3 and Figure 4). Figure 2 represents the basic goal of thrift stores, which is selling donated goods. Therefore, the inflow of *donations* towards *acquired goods* and the outflow of *sales*, can be seen as the representation of Figure 2. However, as found in the subsections on supply and demand, *donations* and *sales* are influenced by other factors as well. While donations are the main category of incoming goods, some thrift stores also resort to buying goods to resell as well. Therefore, the representation of donations is not enough. The inflow of *bought-in goods* is therefore added to the basic structure of *donations* to *acquired goods* to *sales*. Besides, the influences on donations that have been found (e.g. *donor motivation* and *economic prosperity*), are also included. Finally, by incorporating Figure 4 on demand in this combined model, the *sales* of thrift store goods is elaborated on. This is done by adding the indicated influences on sales (e.g. *price, buyer motivation* and *attractiveness store*). By combining these figures (see Figure 5), it is found that both *donations, bought-in goods* and *sales* determine or are determined by the *quality* and *variety of goods*, hence the connections. This elaborate structure will function as a starting-point in explaining the dynamic behaviour of supply and demand in thrift stores.
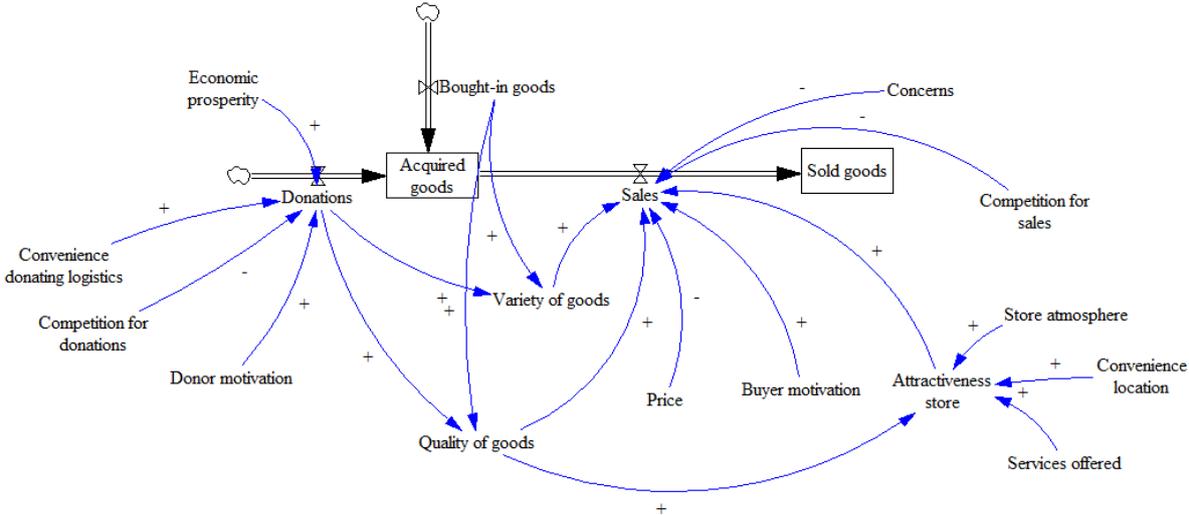
*Figure 5. Elaborated structure Supply/Demand*

In order to further explain the dynamic behaviour of the supply and demand in thrift stores, additional factors have to be taken into account. A first addition to the structure of supply and demand, is to include the internal process between the acquiring of goods until the selling of goods. These steps are included, since the individual steps could also be part of

separate dynamics. This can be seen in Figure 6, where the steps of this process, such as the *accepting* and *sorting of goods*, are included. After stores receive donations, employees either accept or decline the donated goods. It is assumed that thrift stores usually do not use acceptance criteria, but that employees select which goods to accept, based on *usability* for the store (Han, 2013). This relation as such is added to the model. Afterwards, the accepted goods get cleaned, priced individually, often based on quality, and put into storage (Croft, 2003). These steps are indicated in Figure 6. *Inventory turnover* indicates the circulation of goods from the inventory to the store itself, and is done in order to balance the demand of customers for fresh products with the available goods (Croft, 2003; Han, 2013; Galama, 2019). These additions are combined in Figure 6, where the relationship between *quality of goods* and *price*, the relationship between *usability* and *accepting goods* and the intermediate steps between *donated goods* and *sales* are incorporated.


Figure 6. Elaborated structure including steps process

Until now, only linear relations are depicted in the model. In reality, there are feedback-mechanisms in play as well. Since thrift stores cannot directly control the donated goods, they sometimes *request specific goods* (Han, 2013). These requested goods are based on the *availability of goods* and the following *need for specific goods*. The *availability of goods* is not only determined by the *sales* of goods, but also by the goods in *inventory*. Therefore, these variables are added to the model. In addition, the relations between these variables, such as the relation between the *sorting of goods* and *availability goods,* are made explicit. These variables and relations are the basis for the first feedback-loops, namely the reinforcing feedback-loop R1 and the balancing feedback-loop B2. A reinforcing loop enhances whatever direction an initial change imposes on the loop (Meadows, 2008; Sterman, 2001). In Figure 7, this feedback-loop R1, can follow either the quantity, *variety*, or *quality of donated goods*, but assumes in all cases that an increase in *donations*, causes an increase in *sales* and therefore

requires more donations again to keep up with the demand. In addition, a balancing feedback loop, B1, is identified. A balancing loop tries to balance an initial change in a variable and makes sure that the level of a stock remains within an acceptable range (Meadows, 2008; Sterman, 2001). Loop B1 goes from *requesting specific goods* to *donations, sorted goods* and via the *need for specific goods*, to *requesting specific goods* again. Requesting goods can thus lead to both an increase and decrease in requested goods. If more goods are requested, *sales* and, as a result, the *need for specific goods* increase, so more goods have to be requested again. On the other hand, there is a balancing effect, since an increase in requested goods, also make sure there are more available goods, via *sorting goods*, resulting in a decreasing *need for specific goods* and thus requested goods.
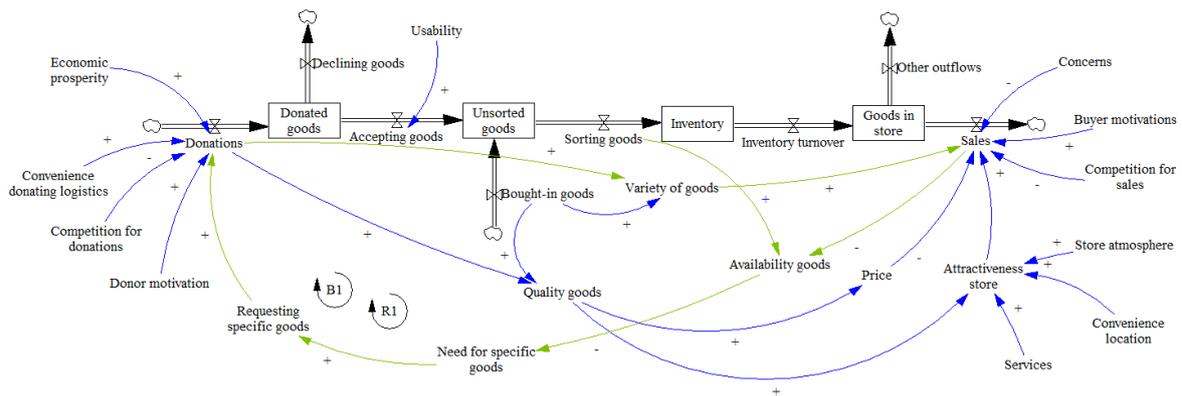

Figure 7. Feedback-loops B1, R1

A similar partial structure is found with regard to *bought-in goods*. If thrift stores face the *need for specific goods*, they cannot only request more donations, but also resort to buying goods. These goods can overcome the challenge of varying quality, quantity and variety of incoming goods (Han, 2013) and can therefore also function as a stabilizing factor in the balance between supply and demand. As a result, a relation between *need for specific goods* and *bought-in goods* is added to the model. *Bought-in goods* can either stimulate more donations and bought goods, but also stabilize the need for more donated or bought-in goods. This can be seen in Figure 8, through the balancing feedback-loop, B2 (via *sorting goods*, *availability goods*, and *need for specific goods to bought-in goods*) and reinforcing feedback-loop R2 (via *sales*, *availability goods*, *need for specific goods* to *bought-in goods*).
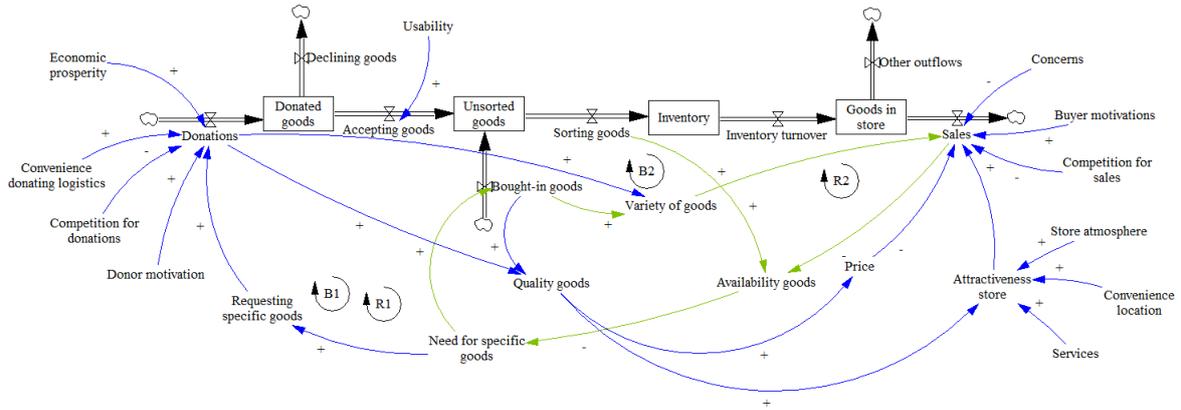
Figure 8. Feedback-loops B2, R2

Moreover, there is another small balancing feedback-loop, B3, between *inventory* and *goods in store* (see Figure 9). This relationship is added and stems from the alignment between goods in *inventory* and the goods displayed in stores. This entails that if the amount of *goods in store* decreases, there is more empty space, which can be filled with new goods again, and vice versa.
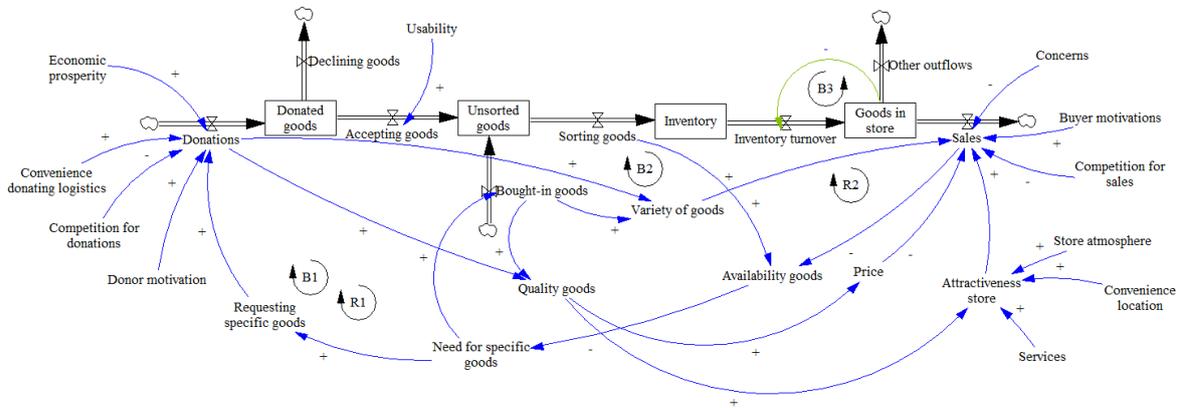
Figure 9. Feedback-loop B3

A final addition to the structure, which relates back to the dynamics in Figure 2 on reuse, is a result of the influence of the first-hand goods market. Since the amounts of sales of second-hand goods are also affected by the first-hand market, this is an important dynamic to include in the model. Sales of second-hand goods can replace first-hand goods to a certain extent, which depends on the level of substitution. This level of substitution is influenced by the relative price a second-hand product has (Thomas, 2011). If a second-hand product costs much less than a new, similar product, consumers might view the second-hand product as inferior or different. As a result, buying second-hand will only have a limited effect on the sales of new goods. Contrarily, if the price of a second-hand good is rather similar to the new

price, increased sales of second-hand goods, can replace the sales of first-hand goods nearly one-to-one (Thomas, 2011, p.114). Therefore, the relations between *price* of a second-hand good and the *relative price difference* between a second- and first-hand good, and between *relative price difference* and *level of second-hand goods substituting new goods* are added to the model. Moreover, the general structure of demand for first- and second-hand goods, is also added to the model. This results in a last feedback-loop, namely R3. If the *demand for goods* in thrift stores increases, the *sales* of thrift stores increase as well. Because people do not buy something both first-hand and second-hand, this would result in a decrease in *demand for first-hand goods*, although the level of substitution could reduce this effect significantly (Mitchell & Montgomery, 2010; Thomas, 2011). The decreasing *demand for first-hand goods*, would increase the demand for thrift store goods again (Thomas, 2003; Bardhi & Arnould, 2005). Figure 10 shows these dynamics.
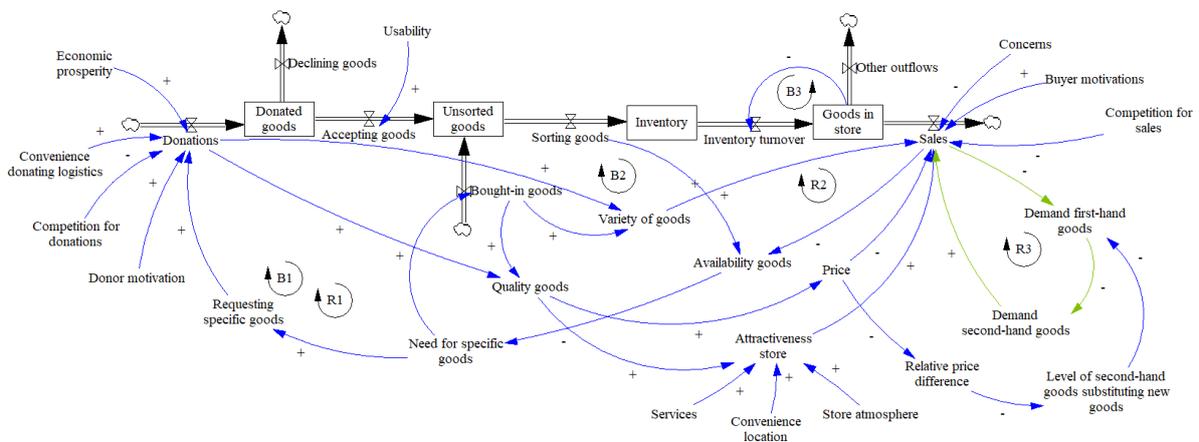
Figure 90. Feedback-loop R3

After elaborating on the initial partial models, the final conceptual model, Figure 11, has been constructed. In this conceptual model, there are six feedback-loops, of which three feedback-loops (R1-R3) are reinforcing and three are balancing (B1-B3). Appendix I contains an enlarged version of the conceptual model.
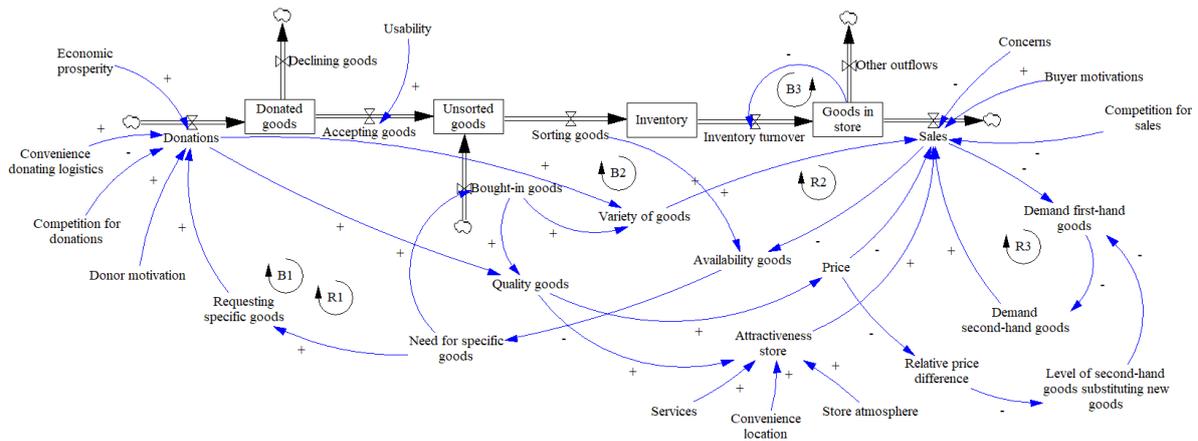
Figure 101. Conceptual model

By proposing this structure in terms of causal relations that drive behaviour, this conceptual model is seen as an explanation of the phenomenon of supply and demand in thrift stores (De Gooyert, 2018, p.661). Since this model is based on scientific literature, it is interesting to see if it is representative for the behaviour of the supply and demand which the participants encounter in thrift stores. By comparing the model with empirical reality, the conceptual model can be validated, which is the process of establishing confidence in the soundness and usefulness of a model (Forrester & Senge, 1980). Therefore, every aspect of the conceptual model will be validated, on the basis of data collection and analysis.

3. Methodology

This chapter describes the methods used in this research and covers, among others, the research strategy, data collection, data analysis, validity and research ethics.

3.1 Situation sketch

In the Netherlands, the term thrift store (kringloopwinkel), is an unprotected claim. Therefore, everyone can use the term thrift store for his or her store(s), and no additional criteria have to be met (BKN, n.d.b). However, to ensure a professional and responsible sector, a branch organization was founded in 1994 by a small amount of Dutch thrift stores. This branch organization is the Branchevereniging Kringloopbedrijven Nederland (BKN). The aim of BKN is to professionalise the branch, by transferring knowledge to thrift stores and granting quality marks (BKN, n.d.a). In 2019, BKN had 62 members with over 200 thrift stores in the Netherlands (BKN, 2020). Members differ in number of stores between one and 27 stores. These thrift stores are non-profit organizations that have social goals, such as creating workplaces for people with a distance to the labour market, and environmental goals, such as stimulating the reuse of goods (BKN, n.d.a). Members of BKN receive donations in order to sell and the branch organization and are more comparable due to their same objectives. In addition BKN and its members perform a yearly benchmark and therefore, more accurate data is available.

3.2 Research strategy

In order to delve deeply into the underlying dynamics of supply and demand in Dutch thrift stores, this research uses a System Dynamics lens and a case study approach. System Dynamics is a method to map the structure of a complex situation, in order to explain its behaviour (Sterman, 2000). This knowledge can, for instance, be used to evaluate businesses (Rodriquez-Ulloa & Paucar-Caceres, 2015). Central elements in modeling these internal structures are feedback and the notion that complex situations can be described in terms of elements and relationships between them (Forrester, 1994; Sterman, 2001; Rodriquez-Ulloa & Paucar-Caceres, 2015). In a complex system, "every event has a cause, which in turn is an effect of some earlier cause" (Sterman, 2001, p.11). However, these causes are the results of previous actions, which is called feedback, and are not stand-alone external causes (Sterman, 2001). If these variables form a closed loop, a feedback-loop, either reinforcing or balancing, arises. In addition, some variables might not be part of a closed loop, but can still have an effect. Therefore, in this research, not only feedback-loops are looked at, but endogenous and exogenous influences as well.

There are multiple types of modelling within System Dynamics, such as causal loop diagrams and (qualitative or quantitative) stock and flow diagrams (Sterman, 2000). For this research, a qualitative stock and flow diagram is chosen, since this can add insights into the issue of supply and demand in thrift stores by visually showing what affects the behaviour over time (Wolstenholme, 1999). Whereas causal loop diagrams are able to describe the feedback structure of a complex situation, qualitative stock and flow diagrams go one step further and are able to explore how process and organizational structure might interact (Wolstenholme, 1999). Causal loop diagrams are not able to identify the elements that produce dynamic behaviour, since it does not make a difference between stocks and flows (Forrester, 1994). By looking at qualitative stock and flow diagrams, the dynamic behaviour can be modelled, and unintended consequences can be identified in advance (Wolstenholme, 1999). Besides, by looking at stocks and flows in a qualitative way, quantitative formulas in order to simulate the behaviour of the model are unnecessary. This is beneficial, since it is less time consuming and the necessary data is often not available, which would otherwise result in speculative formulas and simulations (Wolstenholme, 1999).

In addition, a case study approach is chosen. Yin (2014, p.4) points out that case studies arise out of the desire to understand complex phenomena and are ideal for studies that address the context rather than isolated variables (Yin, in Newman et al, 2015, p.3). He also states that case studies can be used appropriately when research focusses on contemporary events in its real-life context, where the researcher has little or no control over the events (Yin, 2014). When constructing the underlying dynamic mechanisms of supply and demand in the thrift store sector, this study moves beyond studying isolated variables, and looks at the relations between variables especially. Moreover, the researcher looks at the real-life context of the phenomenon, without having any control over it.

Besides, this research follows a multiple-case study design, since including and comparing multiple cases can result in more insights of patterns of a certain phenomenon (Bleijenbergh, 2015, p.48). In addition, this research aims to contribute knowledge that is not only applicable to the case(s) studied, but to the whole non-profit thrift store branch. By incorporating multiple cases in this research design, more robust findings can be produced, which can increase the validity of this research (Yin, 2014). This makes a multiple-case study approach a suitable strategy.

This research also has a deductive nature, since the conceptual model is already a theoretical expectation, based on scientific literature, and this is tested against specific cases,

instead of exploring the underlying mechanisms between supply and demand without any theoretical foundation (Vennix, 2016).

3.3 Data collection

The data collection methods used to obtain qualitative data in order to validate the conceptual model, are the collection of documents and semi-structured interviews. With validation is meant, building confidence in the proposed conceptual model, by testing it to empirical reality (Forrester & Senge, 1980). These data collection methods are chosen due to their complementarity in information. Whereas interviews will be the basis of this research, this will be supplemented with the analysis of documents. Interviews are a suitable method for collecting data, since it offers a considerable amount of useful information in a relative short amount of time (Bleijenbergh, 2015). In addition, interviews are suitable to understand how and why people experience phenomena in a certain way. However, human memory is limited and people tend to forget or mix things up, and tend to look at past memories through the knowledge we have nowadays (Bleijenberg, 2015). Therefore, document analysis can be of value. Documents are a direct representation of factual decisions and can be used to reconstruct dynamic changes throughout time (Bleijenberg, 2015). Unfortunately, documents do not always entail the process which has led to certain decisions, which could be of interest in System Dynamics. By using multiple methods of data collection, the researcher can acquire a more valid image of the situation.

The interviews exist of six face-to-face, one-to-one, semi-structured interviews, with employees from six different thrift stores and they are all recorded after permission. Due to Covid-19, the respondents all had the choice to meet in person or online, based on their preferences. Two interviews were held via Skype. Skype was chosen as the used digital medium, since it offers the opportunity to see each other, and take non-verbal communication into account (Langer et al, 2017). A disadvantage compared to the physical interviews, is that some (non-verbal) communication could have gotten lost due to delays and that there was less room for spontaneity (Sedgwick, 2017). The interviews are semi-structured due to the opportunity to steer the subjects that will be discussed, while keeping the ability to go deeper into interesting aspects (Luna-Reyes & Andersen, 2003, p.281; Schweiger et al, 2018). Based on the conceptual model, the interview guide in Appendix III was formulated. In this interview guide, preliminary instructions are described, as well as the main interview questions and potential follow-up questions.

The stores that are approached for cooperation, were selected based on purposeful sampling. Purposeful sampling is chosen due to the focus on including respondents with the widest variety of perspectives possible, within the purpose of the research (Higginbottom, 2004; Koerber & McMichael, 2008). Due to the scope of this research, however, maximum variation could only be achieved up to a certain extent. Ideally, the number of interviews would have been determined based on the occurrence of saturation, which happens when no additional data are found if additional interviews are held (Glaser & Strauss, 1967, p.61). However, due to the limited scope of this research, a 10% sample of the 62 members of BKN, was chosen to be sufficient.

Thrift store employees are interviewed, in order to build more confidence in the conceptual model and go deeper into the structure and behaviour of the supply and demand in thrift stores (Forrester & Senge, 1980). The experiences managers have had dealing with the potentially changing supply and demand, can make the conceptual model more specific and robust. The organizations and respondents are selected based on specific criteria. The first criterium is that the stores are members of BKN, this was the range specified for the further selection of stores/participants to include in this research. Hereafter, a selection was made based on the size and location of the organizations, in order to represent a wide variety within the data. The researcher wanted to make sure that thrift store organizations of a small (1-3 stores), medium (4-15 stores) and large size (16-27 stores) were included in the model validation and that stores did not centre in a single province. Thirteen thrift stores have been reached out to, based on this selection, of which six managers have responded in time. The respondents indicated that they oversee 2, 3, 11, or 27 stores. In addition, the respondents must have had sufficient knowledge to validate (parts of) the model. Therefore, interviewees must have been working in the thrift store branch for at least a year. This makes it more likely that the interviewee has experienced different circumstances and has seen the reaction of the branch/store to these changes. This adds value since the robustness of the model can be assessed under different scenarios this way. Finally, the interviewees have to be available for an interview.

The documents included in the document analysis, exist of official reports from specific thrift stores and research agencies and newspaper articles, that contain Dutch text and/or images, and are online archive materials. These are used to get a broader view of the structure of the sector. Dutch documents have been chosen, due to the assumed higher representation of the Dutch thrift store sector. The documents which are included in the research are selected

during April 2021, based on a couple of criteria. First, the content of the document must contain relevant information on (aspects of) the variables and relations in the conceptual model, to make sure they are useful for validating the conceptual model. A minimum requirement is that the document should have the term 'kringloopwinkel' in it and is written in the period 2018-2021 for relevancy purposes. Besides, the collected documents should address the viewpoints of involved actors. Lastly, the documents must be freely accessible.

3.4 Data analysis

The recordings of the interviews are first transcribed verbatim (Schweiger et al, 2018). Afterwards, the interview transcripts are coded using the indicators and dimensions developed during the operationalization (Bleijenbergh, 2015). The collected secondary documents are coded based on the same indicators and dimensions. For this coding-process, the program Atlas.ti is used. All documents are first uploaded in Atlas.ti, after which the documents are coded via latent codes (see Appendix IV.I). These codes are the indicators and dimensions from the operationalization, and as such, use similar wording. If fragments of the documents are relevant for multiple indicators, the fragment will receive codes of all relevant indicators (see Appendix IV.II). After all the documents have been coded, the codes are all looked at again individually, whereby the different interviews are compared on this specific code (see Appendix IV.III). By comparing the interview data per code, individual relations can be looked at and are either supported, changed or discarded. This is done using the function 'code manager', because all fragments belonging to one code, can be seen at the same time. This way, the relations and feedback-loops in the conceptual model will all be analyzed and, if needed, the conceptual model is adapted.

The coding is done by the researcher herself. An advantage is the increased reliability that the data is coded in a consistent manner. However, since there is only one person coding the data, the risk of introducing bias into the coding process is increased, which is a limitation of this research (Turner et al, 2014, p.258). The researcher also made memos during the analysis, and used this, together with the transcribed interviews, to look at 'indicated changes' in the model. The changes are categorized under three headings: omitted variables or relations, changed variables or relations and additional variables or relations.

3.5 Validity

A flaw in case studies is that it is not possible to generalize the results using statistical generalization (Yin, 2014). This is due to the small amount of case(s) studied, and therefore, it is not representative of a larger population, of in this case, the thrift store branch (Yin, 2014).

However, case studies can still contribute valuable knowledge that goes beyond the specific case studied, based on analytic generalization (Yin, 2014; Polit & Beck, 2010). In ideal form, qualitative researchers develop conceptualizations of processes and human experiences, which they examine critically. In this process, the researcher distinguishes between information that is relevant to all (or many) participants, in contrast to unique experiences (Ayres et al., in Polit & Beck, 2003, p.1453). "The analytic generalization may be based on either (a) corroborating, modifying, rejecting, or otherwise advancing theoretical concepts that you referenced in designing your case study or (b) new concepts that arose upon the completion of your case study" (Yin, 2014, p.41). Yin (2014) thus argues that it is possible to generalize results at a conceptual level higher than that of the specific case studied, by advancing theoretical concepts or finding new concepts. This research aims to do both, and the data is analysed by distinguishing between specific data of a single respondent, which is disregarded, and general data that is used to validate the conceptual model. As a consequence, this research can, to some extent, generalize its findings even though it follows a case study approach.

In addition, a limited cross validation is performed. To gain more trust in the representativeness of the six selected cases for the members of the Dutch thrift store branch, a representative of BKN is interviewed as well. The specific branch representative is selected based on his involvement and experience with, and responsibility for the environmental aspects of the thrift store sector. Whereas the other employees are responsible for developments regarding the human side of thrift stores, marketing or other aspects, he is familiar with the developments on the environmental side. Since BKN represents the whole branch, it is expected that the representative of the branch organization has an overview of the developments in the branch. This is useful because his insights are less prone to subjective views and outliers. After the initial analysis is done based on the interview data, these outcomes are compared to the interview data of the BKN representative, to see if there are significant discrepancies.

3.6 Research ethics

During this research, certain measures were taken to follow the Dutch code of conduct (KNAW et al, 2018). The researcher has ensured that the participants did not experience any harm, were cooperating voluntarily and that the researcher acts in a scientifically integer way. Before the interviews started, the researcher explained to the participant verbally that their input is used anonymously and it was explained how data is be protected and handled. In

addition, the interviewees were asked if they gave consent to record the interviews. Moreover, the participants were told that they can always indicate that certain information must stay confidential. The researcher made sure that confidential information is not be disclosed anywhere and respondents had the right to withdraw. In addition, after the analysis had been done, the respondents got the chance to see the analysis and could indicate parts that were not accurate or unwanted to include. The researcher has no conflict of interest in this research and is supervised. Participants could contact the researcher via email or phone and were able to check the credentials of the researcher. Lastly, the research topic does not involve illegal activities and data is accessed through legal means (Denscombe, 2019).

3.7 Operationalization

The concepts used in the conceptual model are operationalized in the diagrams below. In order to assess the structure of the model, a couple of concepts are selected for operationalization. Supply is divided in *donations* (see Figure 12) and *bought-in goods* (see Figure 13) and these concepts are divided in dimensions and indicators in turn. Demand is represented by *sales*, which is divided in dimensions and indicators as well (see Figure 14). The division in dimensions and indicators is made based on the variables in the conceptual model.
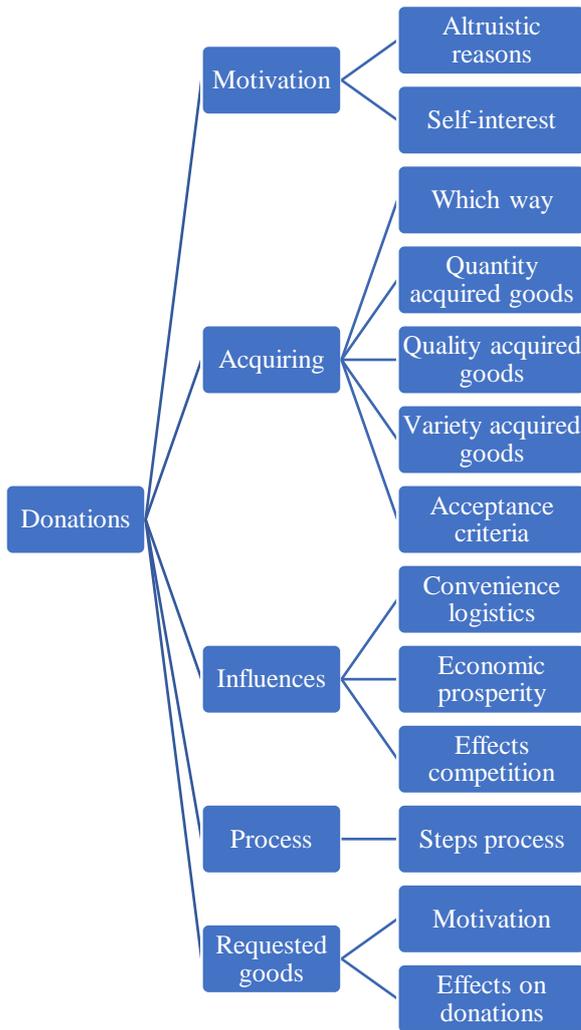
Figure 112. Operationalization Donations (Concept, Dimensions, Indicators)

Bought-in goods is divided in dimensions and indicators as well, which are based on the conceptual model.
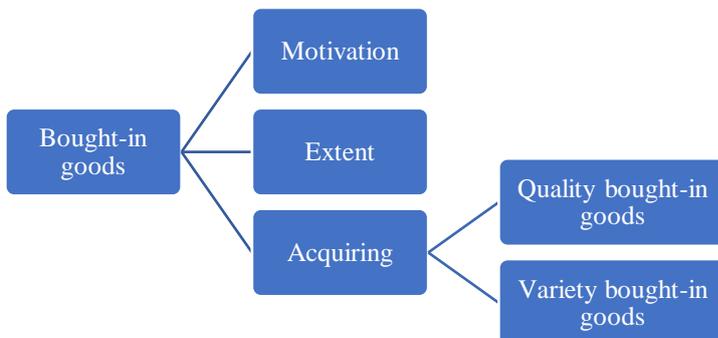

Figure 123. Operationalization Bought-in goods (Concept, Dimensions, Indicators)

Not only the inflow of goods determines the dynamics of supply and demand and possible reuse of goods, but the outflow of goods via *sales*, is important as well. This concept is also divided in dimensions and indicators, based on the conceptual model.
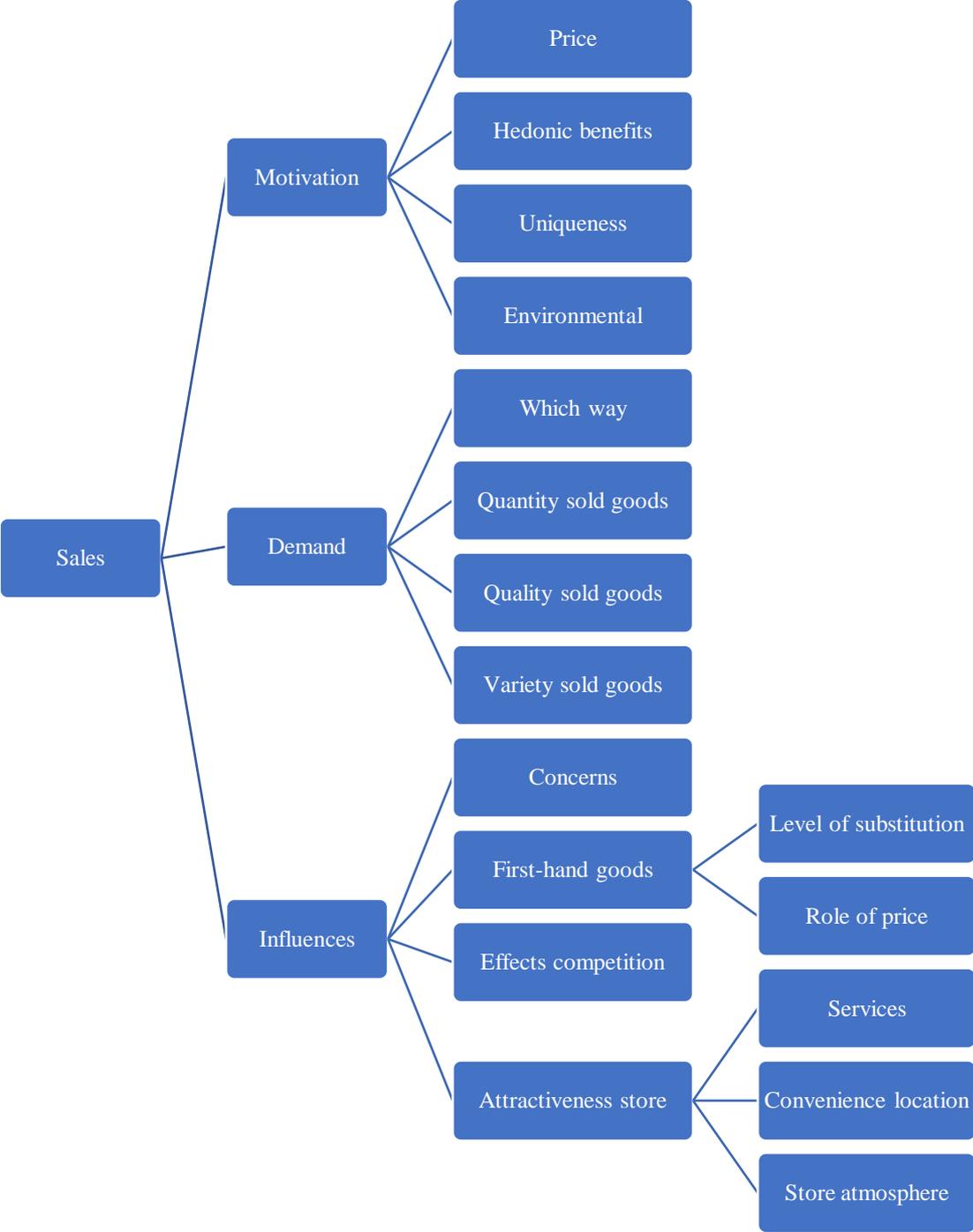

Figure 14. Operationalization Sales (Concept, Dimensions, Indicators)

4. Analysis and results

In order to validate and gain more confidence in the conceptual model (see Figure 15), which is based on scientific literature, interviews and a document analysis have been conducted. In this section, the results are described, resulting in a revised model.
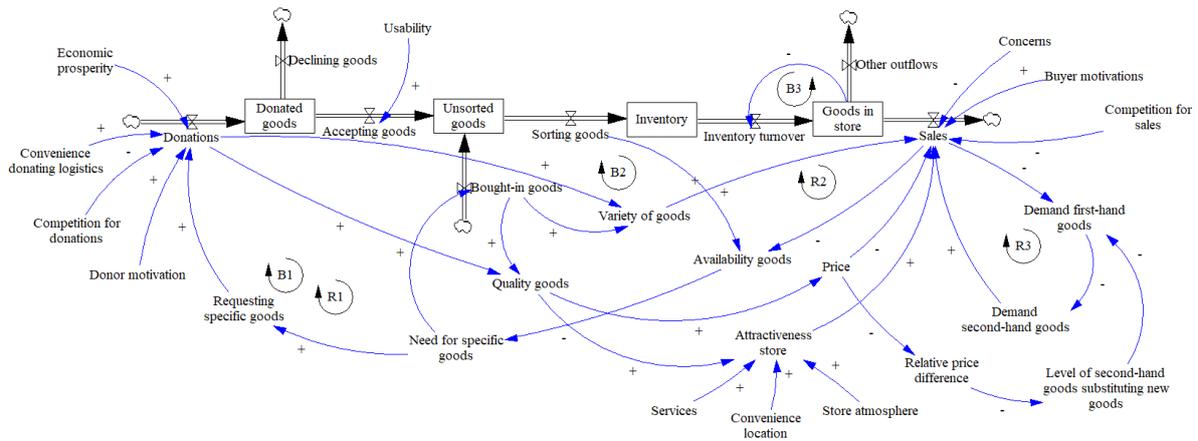

Figure 135. Conceptual model

4.1 Basic structure

In order to validate the conceptual model, the basic stock and flow structure is looked at first. This entails the steps from the inflow of *donations* until the *sales*, or outflow of goods, as can be seen in Figure 16.
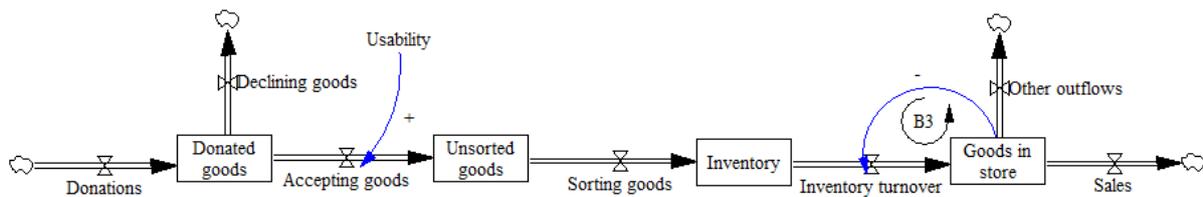

Figure 16. Basic structure conceptual model

In order to assess the representativeness of these steps, all respondents have been asked to describe the steps that take place after a good is donated. The respondents all gave a fairly consistent description of the steps a donated good has to go through, before entering the store.

First, donated goods are either accepted or declined, based on acceptance criteria. Scientific literature suggests that this is solely based on *usability* for the store. However, respondents use different criteria such as saleability, reusability or no criteria at all. Respondent 4 pointed out that they accept saleable goods, (i.e. goods that are likely to sell it they are put in stores) to stimulate the flow rate of goods in store. Four respondents, however, indicated that they accept reusable goods. This includes goods that can be sold in stores, but

include recyclable goods as well. For instance respondent 7, who said that they "*accept all goods that are clean, whole and reusable, which is different from saleable. (…) So we pick up everything that is reusable, and afterwards, we look at which products we can resell*". In addition, the branch representative, respondent 1, also acknowledged this. *"In their intake conditions, most people have that it* [donations] *should be reusable goods, that is the starting point"*. On the other hand, only respondent 5 points out that she uses no acceptance criteria, due to the possibility that customers could not come back after donated goods have been turned down. This shows that acceptance criteria can differ among thrift stores, but also indicates that reusability is used often.

Usability in the conceptual model refers to thrift stores having no specific acceptance criteria, and that donations are accepted based on the usefulness for the stores. However, this is not representative for the respondents. Only one respondent has no acceptance criteria and her reasoning is different. It can be concluded that almost all respondents, including the branch representative, find reusability the main criterium for accepting donated goods. Therefore, the acceptance criterium of *usability* is changed to *reusability* in the model.

Regarding the basic steps that a donated good follows, it can be said that immediately after being accepted, a gross selection takes place. Here, a big separation is made between goods that can be sold in the store and goods that are collected in a container in order to be recycled. This decision depends on different things, such as the state of the product, the type, quality and/or amount of the same good that is already in store or inventory. According to respondent 2: "*If we receive 30 Senseo-machines in a week and we only sell 15, in the preliminary selection we make sure that the second 15 machines that we receive, are no longer put in stores. They get separated there, so the least pretty, least current models are separated from the main stream into a side-stream (…) that do not go towards the store*". Afterwards, the goods that make it past this first selection, are separated based on product type, and sent to a division solely for this product type. Here the goods get checked for functionality, are checked for store worthiness again, are priced and possible repairs are carried out. At this point, the goods that make it past this second selection, are put in *inventory*, after which the goods can be put in store(s). Respondent 6: "*Hereafter, it* [sorted goods] *is ready to be put in the store. If the store calls, 'Oh, I have an empty shelf, it needs to be filled with mugs', for instance, then…, the colleague who is standing in the store, who observes that, knows the place in the warehouse where the mugs are, and then they go towards the store".* Respondent 3 also points out that the moment a shelve is empty, *"it gets*

supplemented. There are trollies in the back, with fresh goods per department". This shows the interaction between the amount of goods in store and the supplementation with goods from *inventory*. This is in line with feedback-loop B3 in the conceptual model, which describes that if the amount of goods in store decreases, the supplementation with goods will increase, which results in an increase of *goods in store* and a decrease in supplementation again.

After goods have been transferred to the stores, there are multiple possibilities. First, goods can be sold, which is the preferable outcome. Unfortunately, not all goods are sold. As a result, there are other outflows as well. This could be that goods are burnt as residual waste, sold to companies for export or transferred to another owned store. It could also happen that certain goods are put back in *inventory* after a while. However, this is usually only done if the stock of inventory is low. Respondent 6 points out that "*that means, that the average couch goes back to the warehouse. Because, otherwise you still won't have anything in storage, and now you will have at least one, until the stocks are filled again*". This shows that the displayed goods in store leave the organization in different ways.

When looking at the conceptual model, it can be said that this basic structure is in line with the experiences of the respondents. In addition to changing the name of the acceptance criterium *usability*, there is an outflow for unsorted goods which should be added. This entails the goods that have been accepted, but are not saleable, and are recycled instead. This revised model structure can be seen in Figure 17.
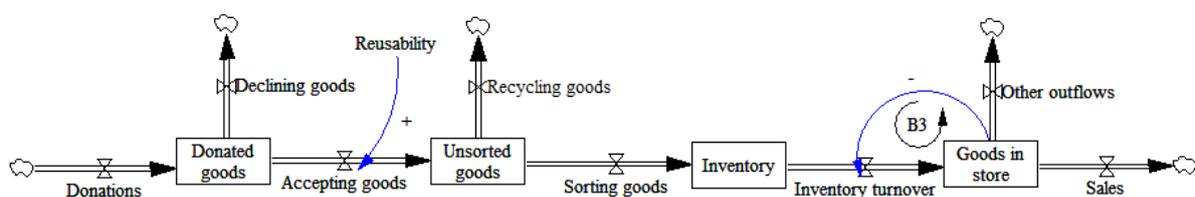

Figure 17. Basic structure revised

4.2 Influences on donations

In the literature, there are multiple influences found on the amount of *donations* (see Figure 18). These influences (*economic prosperity, convenience donating logistics, competition for donations, donor motivation* and *requesting specific goods*) will be elaborated on.
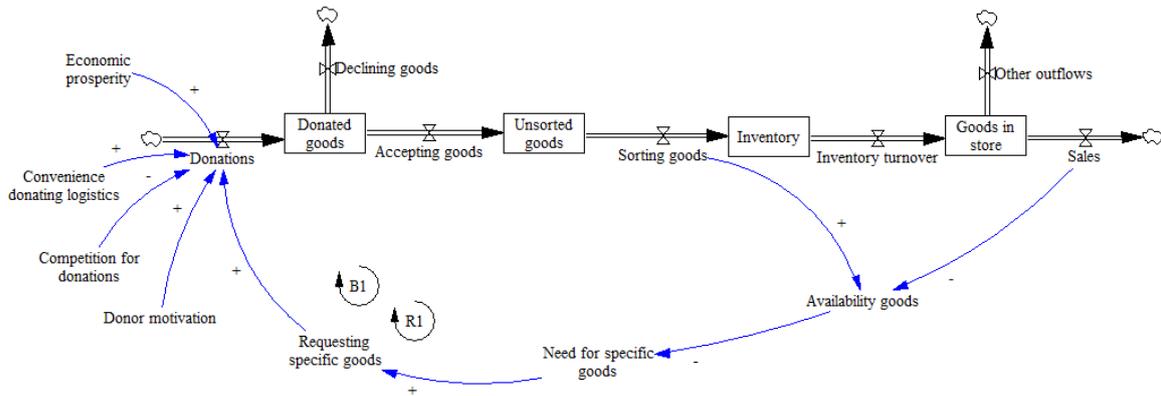
Figure 18. Influences on donations

4.2.1 Economic prosperity

The literature assumes that there is a positive relation between *economic prosperity* and *donations*, meaning the more prosperous people are, the more they donate and vice versa. Half of the respondents did not work at their thrift stores during the economic crisis, but the other three respondents have experienced different effects. Respondent 2 noticed that they still received "*qualitatively good goods, since a big part* [of the Dutch population] *was not affected by the economic crisis*", and even though respondent 5 did not work at her thrift store during the economic crisis, she is *"convinced that there is no economic crisis for a big group of people (…). All the people that come here, have money enough"*. However, respondent 7 did see a decline in quality of donated goods. *"People postponed buying new sustainable, voluminous goods. People tended to buy a new couch less frequently and we didn't receive their current couch. So the quality went down"*. Respondent 1, the representative of the branch organization, also noticed this trend. *"We have seen that at a certain point, both the quantity and the quality of donated goods were definitely under pressure, and I think it has to do with the fact that people tended to literally sit longer on their couches"*. However, since half the respondents were not working at their thrift stores during the economic crisis and there were opposite answers among the other respondents, there is little data to base this relation on. Therefore, this link is omitted from the model.

4.2.2 Convenience donating logistics

The conceptual model describes the relation between the *convenience of donating logistics* and the amount of *donations* as a positive relation. As the representative of BKN pointed out: *"I really believe there is a relation between the service and convenience that is offered, and the amount of goods that one gets. By working service-oriented, I think, yes, that is their strategy to get enough supply"*. None of the respondents voice seeing a negative influence of

convenient donating logistics on *sales* and four respondents explicitly state noticing a positive impact. Respondent 6: "*We try to facilitate that in our way by picking it* [donated goods] *up. I also think that donating is easier if you say, we are coming to pick it up*". Thrift stores also facilitate convenience via having parking facilities in front of the donating location, and offering multiple locations where goods can be dropped off (e.g. stores and recycling stations). Therefore, this relation between *convenience of donating logistics* and *donations* is supported by the respondents and is kept in the model.

4.2.3 Competition for donations

According to respondent 1, representative of BKN, *"At least until 2020, we saw that the amount of thrift stores, the amount of second-hand shops in the Netherlands, increased sharply"*. All respondent unambiguously point out that even though there is (increasing) *competition for donations*, they do not notice effects on their *donations*. Respondent 6: "*We do not notice it… I do not think we miss anything".* A reason pointed out by respondent 5 is that "*there is still enough waste*", and respondent 3 notices that competitors all "*serve their own market".* Respondents 2, 5 and 6 also point out that they try to set their stores apart from the competition, by telling their own story. According to respondent 2: *"We see people that drive 15 km to bring their goods here. Or 20 km. And when I ask why (…) you hear the story that they know that we are doing something good with it (…)".* Since the competition for donations currently has a negligible effect on donations and respondents have not voiced concerns for the future, this negative relationship between *competition for donations* and *donations* is omitted from the model.

4.2.4 Donor motivation

Respondents point out multiple reasons why people tend to donate goods to thrift stores. According to respondent 4, reasons "*vary a lot. People want to give their stuff a second chance, there are also people who just want to get rid of their stuff (…), people who want to do something right (…) and recycling of course".* Respondent 7 notices three types of motivation for donors, which are "*goodwill. The willingness to grant us. Another aspect (…) is the easiness. (…) and thirdly, it is free".* The BKN-representative indicated similar considerations as well. It can be said that these *donor motivations* can be either altruistic or based on self-interest, which is in line with previous scientific research. It can be derived that people donate goods, because they are motivated in some way. Therefore, the relation between *donor motivation* and *donations* will still be included in the model.

4.2.5 Requesting specific goods

Almost all respondents, five out of six, have indicated not to *request specific goods*. A reason for this is, according to respondent 2, that "*the supply and demand matches enough*", so requesting goods is not necessary. The fact that requesting goods is not necessary, is stated by respondents 3 and 4 as well. Respondent 6 also points out the risk associated with asking for goods. "*If you are requesting couches or tables, (..) there is a chance that you receive a lot of goods of which you think, 'I cannot do anything with these goods'. So you will have to dispose them one-to-one*". The only respondent that has indicated that they have requested goods sometimes, respondent 7, also points out that this is not a game changer for his organization. "*The effect is modest, it is limited. People tend to get rid of their stuff, when they are ready for it and it* [requesting goods] *is often not an extra incentive*". Since the scope and effect of requesting specific goods is limited, this relation between *requesting specific goods* and *donations* is omitted from the model. The same goes for the relation between *need for specific goods* and *requesting specific goods*, since the variable *requesting specific goods* is erased from the model entirely. This also causes feedback-loops R1 and B1 to be irrelevant, since requesting goods is no longer a dynamic or closed loop influencing the *donations*.

4.2.6 Revision influences on donations

The changes discussed in the section above, have an effect on the conceptual model. The influences on *donations* are adapted into the following revised model (see Figure 19).
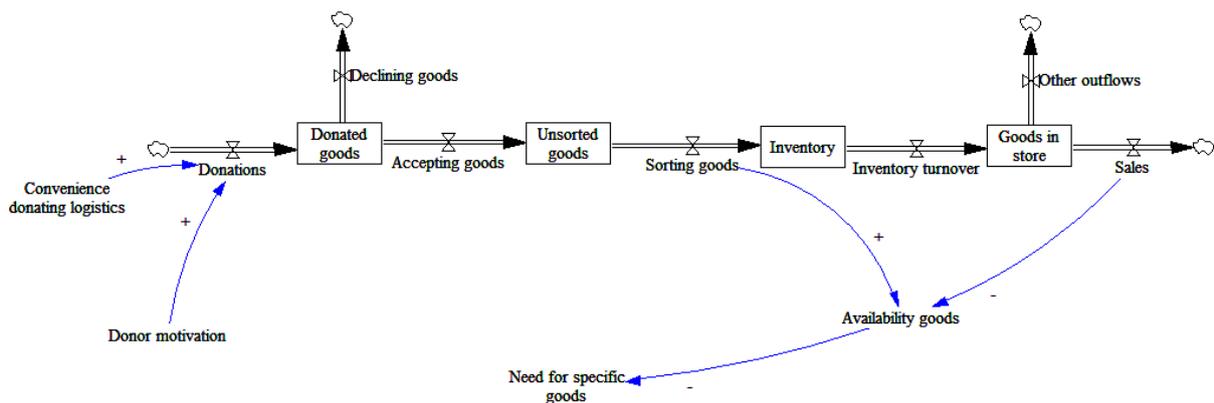

Figure 19. Influences on donations revised

4.3 Influences of donations

Based on the conceptual model, it is assumed that more *donations* will result in a larger *quality* and *variety of donations*. These two effects are addressed.

4.3.1 Quality goods

Respondents have pointed out that if the amount of *donations* is little, stores settle for a lower *quality*. Respondent 7: *"The bigger the success at the front* [sales in stores]*, the faster we will see a shortage in the back* [too little inflow of goods]*. (…) I mean, then you will lower the quality of your inflow a little"*. Respondent 4 also points out that if they receive little donations, they tend to be less critical when accepting goods. Respondent 6 indicates: *"What stands out is, that if the donations are little, there is little attractive goods as well and if it* [the donations] *is a lot, there is a lot more attractive as well"*. This shows that if the donations increase, there are more qualitative goods donated as well and vice versa, which tend to increase the quality of goods in stores. Since these findings are in line with the assumed positive relation, this relation between *donations* and *quality goods* is supported and can be kept in the model.

4.3.2 Variety of goods

Regarding the influence of the amount of *donations* on the *variety of donations*, little can be concluded. Whereas respondents do see a change in type of products donated, for instance more Ikea and Action goods and less oak furniture (respondents 2, 4), they do not attribute that change to the amount of donations they receive. Respondent 5 indicates that the overall variety is rather consistent. *"You get an X amount of cups, X amount of egg cups, X amount of chairs (…). You know we will receive this much from this group of people, there will be this much of this and that much of that"*. In addition, respondent 3 states that the variety in donations does not change with changing donations. *"It all stays the same, because people know what they can bring here and what not"*. Respondent 7 also points out that even though the donations vary daily, in the long run it evens out. The experiences respondents voice, are also in line with the insights of BKN representative, respondent 1, as he points out that *"the supply is always different, but the pattern we see, is stable"*. This means that the respondents do not experience an effect of the amount of *donations* on the *variety of goods*, but rather a stable pattern over time. Therefore, little support is provided for the positive relation between *donations* and *variety of goods*, and this link is omitted from the model.

4.4 Bought-in goods

Another way thrift stores can receive goods, is by purchasing goods (see Figure 20).
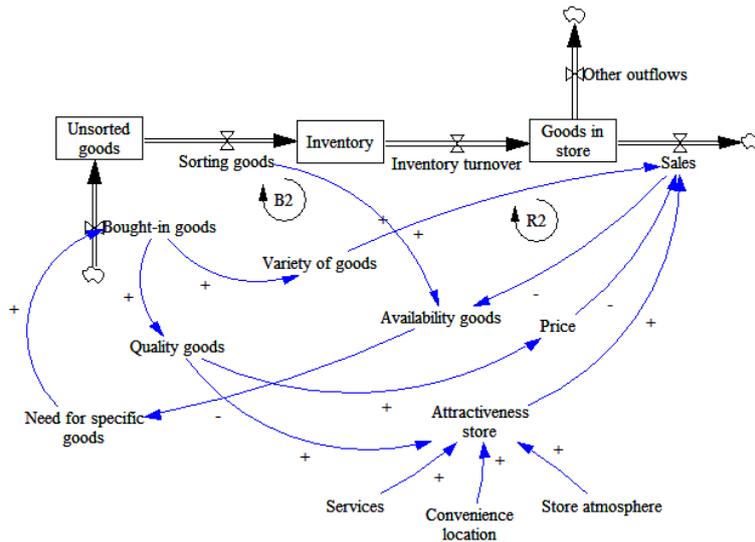
Figure 20. Bought-in goods

In the literature it is pointed out that buying goods in order to sell in stores, is only done by a small amount of thrift stores. It occurs that this is in line with the respondents in this research. Of the six respondents included in this research, only one respondent said that his organization buys (a limited amount of) goods to sell to customers. Reasons respondents pointed out not to buy goods are because they do not want to become a commercial organization (respondent 2) and it yields little money (respondents 5, 6). Respondent 7, however, wants to gain more control over the inflow of goods, and therefore, seeks partnerships with regular retailers. Respondent 7 buys used washing machines and explains: *"The best machines are looked at and refurbished, and we take those and resell them in our stores. So together with other parties, we try to acquire a more constant quality in our inflow. Often it is not so much the quantity, but the quality what it is about".* The washing machines come with a warranty and, according to respondent 7, "*because we ask a higher price than we normally would, you have to make sure that you also offer quality and service*". Bought-in goods can facilitate a higher quality, but also increase the variety of goods, since there otherwise might not be washing machines in store. This is also articulated by the representative of the branch organization. Respondent 1: *"If you buy goods, of course you have higher requirements. It cannot be the case that you buy something, and then it turns out it is unsaleable, because it is not repaired properly. So there are definitely higher quality requirements".* Regarding the variety of goods he also states that buying washing machines is an addition to the assortment in stores, since *"otherwise, those washing machines, they would not have been in the store".* This shows that the effects of buying in washing machines, are in

line with the assumed relations in the model, suggesting a higher amount of *bought-in goods*, increases the *quality* and *variety of goods*.

When looking at the conceptual model, it can be said that whether or not thrift stores buy specific goods, depends, among others, on the *need for* those *specific goods*. Lack thereof, can result in not buying those goods, and vice versa. Therefore, this relationship between *need for specific goods* and *bought-in goods*, is supported. In addition, it can be said that *bought-in goods* add to the total amount of goods a thrift store has, since this is in addition to the accepted donations. As a result, the positive relation between *bought-in goods* and *unsorted goods,* can be kept in the model as well. Even though the relationships between *bought-in goods* and the *quality* and *variety of goods* offered in thrift stores, are supported, the evidence is rather small. Only one out of six respondents stated to buy in goods. In addition, this respondent also indicated that they only buy washing machines and that they rebuy previously donated clothes from sorting centre, which would result in only a small effect on the total model. Therefore, the sub-structure of *bought-in goods* can be kept in the model, but has to be regarded with caution.

In order to evaluate feedback-loops B2 and R2, the role of *availability goods* needs to be elaborated on. The *availability of goods* a thrift store has at a certain point in time, depends on both what they have acquired and what is sold. As respondent 6 points out: *"But in the end, our goods are so unique, there is only one here. I do not have a full warehouse"*. This indicates that goods that are sorted increase the available goods, but once it is sold, the available goods decrease. The *availability of goods* also influences the *need for a specific good*, as respondent 6 recalls: *"At a certain point in time, we have a shared app with all the stores, you see that question popping up more often, 'Hey, is there a store with couches? Is there a store with leftover couches, since we have no couches left anymore'"*. This shows that if the availability of goods decreases, the need for this type of goods, increases. It can be concluded that feedback-loops B2 and R2 are supported and can be kept in the model. This means that buying goods in order to sell to customers, has both a balancing and a reinforcing effect. Looking at these effects, it can be seen that the *availability of goods* determines whether the balancing or reinforcing effect dominates.

4.5 Influences on sales

There are multiple influences that determine the *sales* of second-hand goods (see Figure 21). These influences (*concerns, competition for sales, attractiveness store, buyer motivation, price* and *variety of goods*) will be elaborated on, in order to validate the assumed relations.
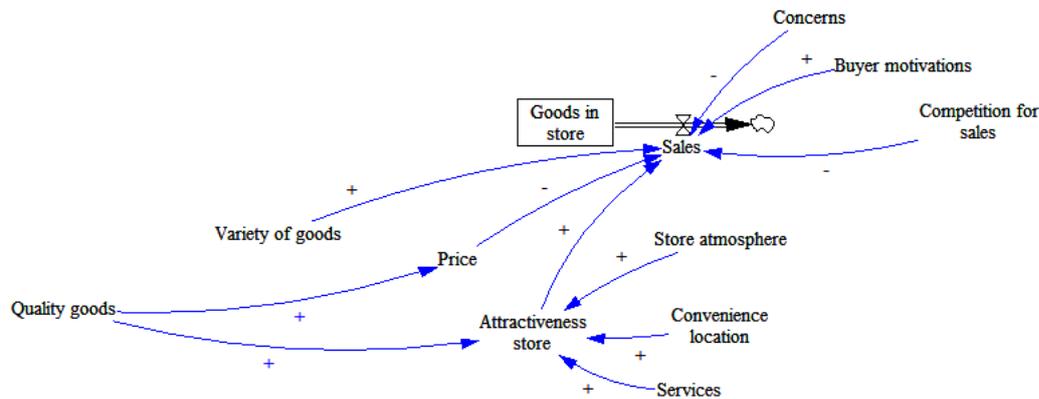
Figure 21. Influences on sales

4.5.1 Concerns

All respondents recognize *concerns* as reasons why people tend to not buy (specific) second-hand goods. Most suggested concerns are regarding hygiene or risks regarding malfunctioning of appliances. Respondent 7 noticed that some people find second-hand goods, such as mattresses, dirty. *"I can certainly imagine that. So that are the products we sell the least"*. Some stores try to cope with this by not selling certain items at all. For instance, respondent 3 states that: *"We do not accept mattresses, (..), towels, that goes…, that is not accepted and if it is accepted accidentally, it is thrown away immediately"* and respondent 4 also states that they *"usually don't sell those* [mattrasses, pillows, blankets] *in the store"*.

A way three respondents (respondents 2, 6, 7) try to overcome malfunctioning concerns, is by offering guarantees. According to respondent 7: *"Domestic appliances and brown goods, everything with a plug, we offer a guarantee of four weeks"*. Besides, respondent 2 points out that they *"offer a guarantee on bikes (…) if you buy a Senseo-machine or a TV, you get a guarantee. I find that important. You should deliver a good product"*. However, it is also pointed out that most concerns are unnecessary. Respondent 2: *"Some people find it dirty, (…), but I can refute almost all arguments"*. In addition, BKN-representative, respondent 1, indicates that *"There are a lot of prejudices, that it is smelly, rusty, dirty or broken (…) and I know that that is inside peoples' heads. But at the same time I know that, in practice, you don't have to worry about that"*. Although respondents do not always agree with the concerns people have, respondents notice the negative effect of these concerns on their sales. Since the influence of *concerns* on *sales* is recognized as such, this relation is kept in the model.

4.5.2 Competition for sales

In line with the *competition for donations*, all respondents, including the branch representative, indicate that they do not feel a noticeable effect of *competition for sales*.

Respondent 4 points out that *"we mostly focus on ourselves, (...) and by doing that as best as we can, and keeping the store as nice as possible, (...) and by making it as interesting as possible for everyone"*, they try to cope with their competition. Respondent 2 suggests that every store has unique items, and thereby does not compete in a regular way. Respondent 7 states that the biggest competition is not coming from other retailers, but are other leisure activities, such as going to the beach or sitting in the garden. Since none of the respondents indicated feeling a significant effect of competition for sales, nor are they expecting this to have a significant effect in the future, this relation between *competition for sales* and *sales* is excluded from the model.

4.5.3 Attractiveness store

All but one respondent, think *the attractiveness* of their *stores* is (very) important with regard to selling goods. Respondent 2 points out that: *"It is a mix of different things, it is a mix of quality, price, mostly in relation to quality, the way of presenting, kindness of the staff, high accessibility of the store, a discount coupon they receive, yes, simply parking in front of the door. It sounds really stupid, but that are all things that help make your store attractive".* The respondents describe different aspects that contribute to the *attractiveness* of their stores, such as the *store atmosphere, services* they offer (e.g. a store café), and *quality of goods*.

Regarding the way thrift store employees display their goods, all respondents pointed out that the positioning of a good, can also influence if it is bought. Respondent 1, BKN-representative, points out that *"what we know is, for example, that if you style regular stuff as if you are in the Ikea, if you style it as some sort of living room, that the chances of selling it are way bigger than if you put it loose on a shelve"*. And respondent 5 says: *"What we focus on is, you have to have it from the way you position it* [goods]. *You should display it based on target audience"*. Respondent 4 even noticed that by changing the positions of goods weekly, that *"especially those changes in the store, that really generates sales"*. Respondent 3 also states that they *"rearrange the goods in store regularly, and that if a cup is positioned here, it won't sell, but if you put it there, with a little plant next to it, then it will sell. (...) So by varying the assortment throughout the store, resulting in a slightly different look, which causes it to might sell"*. This shows that the positioning of goods in thrift stores is important in the generation of *sales*.

The importance of the location of a thrift store on the attractiveness of the store, is less clear. Respondent 4 thinks that being in the same location for a long time, makes sure that people know where to find them. Respondent 6 also points out that the most important thing

of your location is that people know where you are. *"It should be self-evident"*. Respondent 5 indicates that the accessibility of a location is important. Respondent 5: *"We notice that, the scope of people that come and shop here is (…) big, because it is easily accessible"*.

Since almost all respondents find the attractiveness of their stores important for their sales, this relation between *attractiveness store* and *sales*, is kept in the model. Whereas, the services, quality and atmosphere of a store, contribute to the attractiveness of the store, in an undisputed way, the location of a thrift store, seems less important. However, it can be said that the more convenient a location is, the more attractive that store is. Therefore, these aspects are all still included in the model.

4.5.4 Buyer motivations

Respondents indicated various reasons why people tend to buy second-hand or in their stores, such as uniqueness of products, items that are no longer available in regular retail, or the relatively low prices. Respondent 2: *"I see in my own circle of acquaintances, that people who never visit a thrift store, now ask me 'do you have that kind of lamp?', because a. it is no longer available in the retail and b. because they know it is cheap here"*. Respondent 3 recognizes a different type of customer: *"a group that really likes to snoop, to see if they can find that one first edition book"*. Looking back at previously found reasons in the literature of why people tend to buy second-hand, price, hedonic benefits and uniqueness are all present in the answers of the respondents. A final motivator, environmental reasons, is mentioned less by the respondents. This is limited to respondent 7, who points out that he thinks the 'Insta-generation', might buy second-hand, because they value sustainability. The relation between *buyer motivation* and *sales* is kept in the model, because the respondents recognize that motivation drives people to come to thrift stores (and buy second-hand goods).

4.5.5 Price

All respondents *price* their goods based on different aspects, such as *"knowledge of the product and knowledge of the market (…), quality, uniqueness of the item, and state of the item"* (respondent 2). However, respondent 5 targets a different kind of customer and also states: *"We price based on what a customer can pay, so the more the better"*. Respondent 1, representative of the branch organization, also indicates that stores differ in their target audience. According to him, pricing is not only done based on knowledge and quality, *"it also has to do with the target audience that comes into the stores, if you choose for a somewhat higher segment, or for a somewhat lower segment. So eventually, there is a pricing strategy, and that strategy is based on the certain target audience you want to reach (…)"*. All

respondents indicated to look at the price a similar, new good would have, and decide on a lower price, based on their own considerations (e.g. quality, and state of the donated item).

All respondents agree with the proposed positive relationship between *quality goods* and *price*, which means that the higher the quality of a product, the higher the price and vice versa. This relation is thus kept in the model as such. In addition, the negative relation between *price* and *sales* is also recognized in practice. As respondent 1 points out: *"The thrift stores that structurally price low, they do that to achieve a high turnover. So that can be used as a strategy to sell as much as you can"*. However, an incongruence occurs, since respondents do not agree with the following reasoning: if the quality of a good increases, the price increases, resulting in less sales. When asked about goods that are more expensive, due to their higher quality, respondent 3 answers: *"It goes out the door just as quickly.(…) Based on experience, they* [employees] *have learned throughout the years, what people are willing to pay"*. Respondent 4 states: *"Usually, the items of higher quality also get sold faster"*. Respondent 2 also notices this in his stores. *"If we receive a special item and we ask a reasonable price, say 30% of the value, it is sold just as fast as a product of a lower price, because there are a lot of customers in our stores that know what they are buying and they really know the difference between a Mercedes and an Opel"*.

Whereas the two individual relations between *quality* and *price*, and *price* and *sales*, are recognized by the respondents, the polarities of the relations combined is not representative for reality. Therefore, a change has to be made in the model, to intercept this effect. In order to capture this behaviour, a new factor is included in the model, called the *Price/Quality ratio*. This variable is a result of the *quality* and asked *price*, and the *experience of employees* who price goods, and this ratio, in turn, influences the *sales*. The experience of employees is important since their decisions determine if the price and quality are in line. According to respondent 6: *"You notice it when you have made a wrong judgement of price compared to quality, then it doesn't get sold"*. Besides, *price* is not only influenced by the *quality of goods*, but also by the state of the item and price a similar, new item would have. These factors have been described by all respondents and are added to the model as well.

4.5.6 Variety of goods
In addition, a higher *variety of goods* is also assumed to increase *sales*. It can be said that all respondents work with changing assortment categories, since they only sell Christmas ornaments or garden equipment in certain periods of the year. This results in a changing variety of goods in store at times. In addition, respondent 1, BKN-representative, suggests that

more variety in assortment, results in *"new supply that was not here first, and is now. So I definitely think that that generates more sales"*. Besides, respondent 7 states that he wants people to know *"that if you are looking for a bike, that you can go to* [name thrift store]. *So we always want to make sure we have a broad assortment and therefore want to have a certain variety in our assortment"*. This both increases sales and therefore underpins the assumed relation.

However, it should be taken into account, that people also want to have a choice within a product category. Respondent 6: *"You do not have to have an endless diversity in departments, but you need to have a good assortment per department"*. In addition, the variety of goods within a product category tends to vary as well. As respondent 3 notices: *"Now, a lot of couches are being sold, so you start to think why that is (...). So you will try to analyse it a bit, and try to discover a trend, and if there is, where it comes from"*. And respondent 4 points out that *"we are always a bit behind the trends. What people get rid of, they no longer want, and that is what you see"*. This could have a negative effect on the *sales*. While keeping this in mind, the relation between *variety of goods* and *sales* is kept in the model unchanged.

4.5.7 Revision influences on sales

After elaborating on the influences on *sales*, the indicated changes have led to a revision of the conceptual model (see Figure 22).
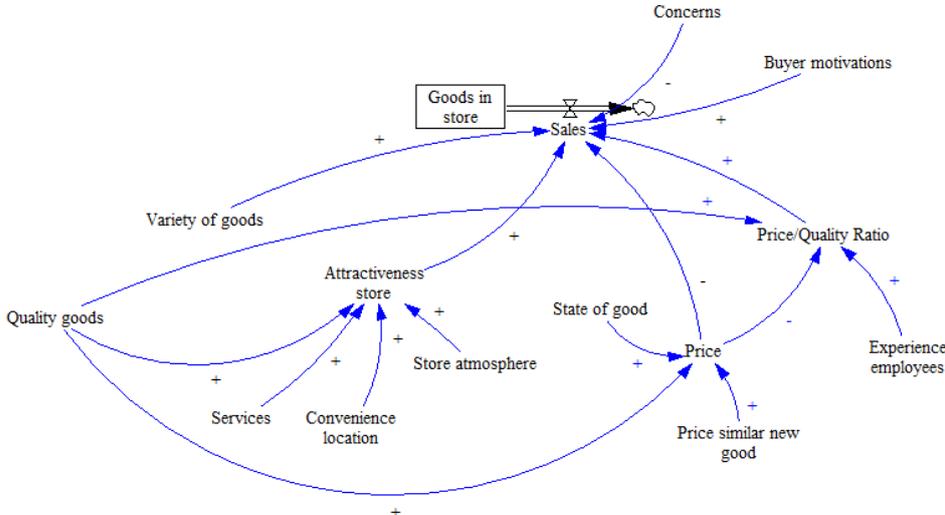

Figure 22. Influences on sales revised

4.6 First-hand goods

It is assumed that there is an influence of the *demand for first-hand goods* on the *sales* and *demand of second-hand goods*. This influence of the first-hand market has a negative relation, which means that either the first- or the second-hand market would benefit from an increase in demand. As can be seen in Figure 23, this influence works both ways, resulting in feedback-loop R3.
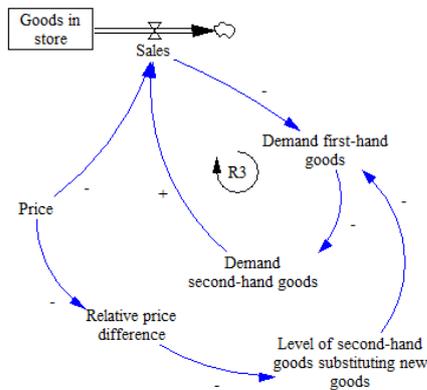

Figure 143. First-hand goods

Five respondents indicate that selling second-hand goods, can replace buying first-hand goods to some extent. Respondent 6: *"We sell those second-hand goods, which they buy at our store, and they do not go to Ikea, for instance, to get a new couch"*. This also works the other way around, as respondent 1, BKN-representative, points out: *"For a washing machine, or a couch, you know that if someone buys that second-hand, they will not buy the same product new as well"*. However, not all respondents believe that buying second-hand can replace buying first-hand completely. Respondent 2: *"No, I don't think that it replaces it completely. I believe it will get alongside it, and play a bigger role than it has previously"*. And respondent 3 points out that *"I don't think that if you look at the economy, that it is a one-to-one relation, that because we sell so many second-hand goods, that the first-hand market will fall apart"*. It can be said that the demand for first-hand goods is influenced by the second-hand market, and the level of substitution. When asked about people's propensity to buy extra goods that are not essential, respondent 6 answered: *"I think that (..) 75% is not essential. That vase that that woman is paying, yes, I can't imagine that she does not have any vases at home. However, what I find good of our organization and the thrift store world in general, is that instead of buying something new (…), they buy it here"*. However, respondent 4 sometimes wonders if the thrift store branch *"actually contributes or that it only stimulates*

people to buy new things, because instinctively, they can get rid of their old stuff in a responsible way". This shows that buying second-hand goods can replace buying first-hand goods to some extent. It follows that feedback-loop R3, the higher the *demand for second-hand goods*, the higher the *sales* of second-hand goods, the less new goods will be sold and vice versa, is in line with the findings. It should be taken into account, however, that this effect is limited by the level of substitution.

Theory states that this *level of second-hand goods substituting new goods* is influenced by the *relative price difference* between a second-hand good and the new product. Whereas the literature states that the lower the relative price difference, the higher the rate of substitution, the respondents indicated different experiences. Respondents 2, 4, 6 and 7, all said explicitly that their prices should be lower than the price for a new similar item, and the other respondents also point out other factors that influence the decision, whether to buy first- or second-hand. Respondent 6: *"But I believe that if you come here and you see that that vase that normally costs 50 euros, is here for 5 euros, then we have won the battle. There is not a hair on my head that thinks that the customer won't think 'Oh, I am going to buy it, because it costs 50 euros there, and only 5 euros here'"*. This is in line with the experiences of the branch representative, respondent 1, since he points out that: *"The bigger the price difference between second-hand and new, so the cheaper a second-hand product is relatively, the bigger the chance someone would choose to buy second-hand (...)"*. Respondent 4 does indicate that *"if you look at a new couch, a cheap, new couch costs 600 euros easily. I don't know if it would matter if it* [second-hand couch] *would cost 50 euros or 100 euros. I don't think you would leave it for that"*. This shows that respondents see that if second-hand products cost relatively less than new, similar products, this increases sales. However, the extent of this relative difference, does not have to be the largest, in order to bring about sales. This shows that most relations can be kept unchanged in the model, except for the polarity of the relation between *relative price difference* and *level of second-hand goods substituting new goods*. This should be a positive relation, instead of a negative relation.

4.7 Other findings
While analysing the relations of the conceptual model, two other aspects stood out.

4.7.1 Goodwill
Four out of six respondents have come up with the importance of *goodwill* ('gun-factor') on their donations by themselves. Respondent 5: *"It is all about goodwill. It is about telling what you do and then (...) your store will run well. Then you will receive the right goods and*

people will know what you do and do not want to have". Respondent 2 states: *"It starts with goodwill, and I really call it that, because that is what it is. People can give it to everybody, but they have to give it to us, is what I always say"*. In addition, respondent 1, the branch representative, also points out that *"thrift stores have a relatively high amount of goodwill. We really encourage our members to tell the story, how they work, why they do it, showing their impact on local employment opportunities for people with a distance to the labour market, impact on the environment, no profit, also important. (...) and I think that plays a crucial role in why people are willing to donate their goods that are still usable, to a thrift store for free"*. Since a large amount of respondents have touched upon this, it is interesting to see how this would fit into the model. Whereas donor motivation touches upon a more general motivation for people to donate their goods, goodwill says something about the reason why people tend to give their goods to a particular thrift store. Since this is a different focus, which is not captured in the variable *donor motivation,* goodwill is included in the model as a positive relation between *goodwill* and *donations*.

4.7.2 Cycle of replacement

During the interviews, five respondents have also touched upon the replacement of used by new, first-hand goods, or the quality of first-hand products. Respondent 6 notices that *"now that the stores have opened again, a lot of people will start to buy first-hand goods again. That means that the goods they are using right now, the goods that they do not want to bring to the thrift stores just yet, will partly find their way to the thrift stores. (...) So there is a cyclical trend to it, in how the consumer handles replacement of goods, relative to the donation of it"*. In addition, thrift stores could face a change in future donations as a result of the transition to a more circular society. Respondent 2 points out that if people only buy second-hand *"then there won't come in new second-hand goods, right. If all first-hand goods are replaced, then there will not be second-hand and eventually, the quality will decrease"*. According to respondent 7, however, that will not be the case. *"I believe that we, even if the new, well it will never completely dry out, but it is fine if it gets divided in halves"*. But he also points out that *"all of us should buy qualitatively better goods, that can last longer, so the thrift stores will receive qualitatively higher goods as well"*. Respondent 4 also sees that the quality of incoming goods relies on the quality of first-hand goods. *"The quality of goods is getting worse, in my opinion, and I think that has to do with the overall quality of products in stores. If you look at big retail chains, such as Primark, who make clothes for very little money, to follow trends, and we receive that, and 9 out of 10 items is no longer suitable for a*

second life". This illustrates that the demand for first-hand goods has a significant effect on the donations of thrift stores.

The influence of first-hand goods on donations was not adopted in the conceptual model. However, since many respondents point out that this does play a role, a relation is added to the model. This relation entails the positive relation between *demand first-hand goods* and *donations*. As a result, a new balancing feedback-loop (B4) is identified. This feedback-loop implies that if demand for first-hand goods decreases, the amount of donations decreases as well. This would result in less sales (of second-hand goods), and would thereby increase demand for first-hand goods again, and vice versa. This can be seen in Figure 24.
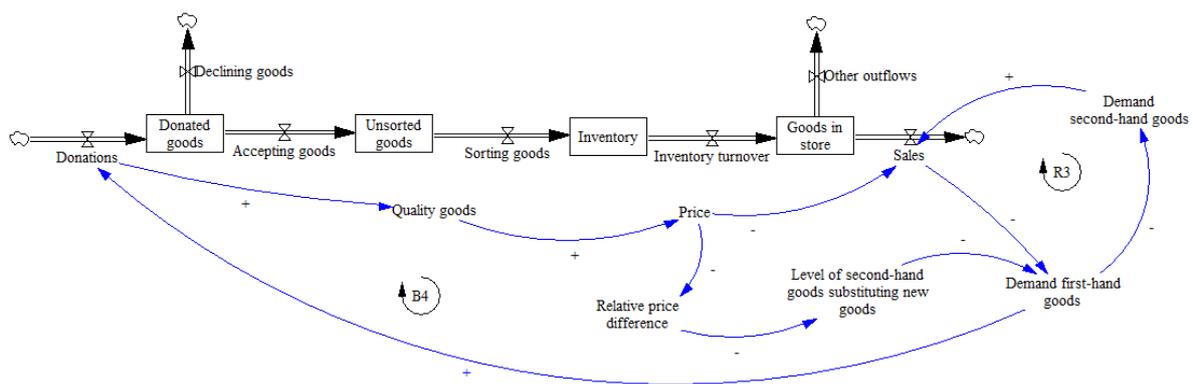
Figure 154. Feedback-loop B4

Feedback-loop B4 is part of the main structure of the model, since this connects the supply and demand of second-hand goods directly. Loop R3, on the other hand, is part of a sub-structure in this model, since it only influences sales. The reinforcing effect of loop R3 cannot go on endlessly, since loop B4, a balancing loop, makes sure that at a certain point in time, sales would decline again. This interaction of feedback-loop B4 with R3 thus makes sure that loop R3 can only operate within a certain bandwidth.

4.8 Document analysis

In order to validate the conceptual model even more, seventeen documents have been collected, coded and analysed, of which eight proved to be useful. It should be noted that the documents included are not only representing thrift stores that are affiliated with the branch organization, but sometimes include (non-) profit thrift stores with less social and/or environmental goals as well. As a result, data found in these documents could create a distorted image, since it is not clear whether or not this is resulting from a different type of second-hand stores. After analysing the selected documents, it stood out that only a small

amount of relations is talked about. The aspects that are included in the documents, are discussed below.

4.8.1 Donor motivation

Five documents talk about the reasons why individuals donate goods to thrift stores. In those documents, different reasons are found, such as the positive effect on the environment, easiness of donating, cleaning up the house, and helping others (Accenture, 2019; van Montfoort, 2019; Kantar, 2019; Tangram, n.d.). Reasons found why people tend to not donate their goods, are because they are not reusable any more, people want to sell them to gain some money or people find it too much effort to do so (I&O Research, 2020). These reasons are in line with the reasons given by the respondents and found in literature. The relation between *donor motivation* and *donations* is further supported and kept unchanged.

4.8.2 Buyer motivation and concerns

In four documents, reasons why people tend to buy in thrift stores were discussed. In these documents, people have indicated that they buy second-hand because of the unique items they can find there, the price, environmental benefits and hedonic benefits (Accenture, 2019; van Velzen, 2018; Kantar, 2019). A respondent described thrifts stores as *"a fun trip with surprising and fun products for little money and mostly contributing to the stimulation of reuse"* (Accenture, 2019). Another customer pointed out that she is not looking for something in particular, but that she finds it *"lovely to browse through the store. I never know that I am looking for something, until I see it"* (van Velzen, 2018). Concerns voiced by respondents in reports of I&O Research (2020) and Kantar (2019) about why they tend to not buy second-hand, are that they prefer to buy new goods, thrift stores do not have what they are looking for, something is wrong with the products or hygiene concerns. These findings are in line with the motivations and concerns to buy second-hand, suggested by the respondents. Therefore, the positive relation between *buying motivation* and *sales* and the negative relation between *concerns* and *sales* are further supported.

4.8.3 Attractiveness store

Some documents also showed the importance of *services, store atmosphere and location* with regard to *sales*. According to research by Accenture (2019), *"Product assortment, store atmosphere, customer service and cleanliness weighs more than half in the decision to come to a thrift store"*. Other services that are appreciated by customers and often offered are some form of catering, repair-cafés, or an atelier (Accenture, 2019; van Velzen, 2018; Pater, 2019). This is in line with the experiences of the respondents. However, not all customers experience

the store atmosphere as sufficient. A respondent of the I&O Research report (2020) pointed out that *"Some thrift stores are so full of old junk, that the atmosphere is not good"*. This says something about the state of the variable *attractiveness store*, but not the relation itself. Therefore, these relations are kept unchanged in the model.

4.8.4 Other findings
During the interviews, a majority of the respondents pointed out that *goodwill* is a driving factor for individuals to donate at their thrift stores. In the documents, goodwill was mentioned once. In this article, the director of a (not included) thrift store organization emphasized *"We are really thankful for everyone who grants us goods"* (Delft op zondag, 2020). This is in line with the way the respondents indicated the importance of goodwill.

Regarding the other finding of the cycle of replacement, little was talked about this in the documents. It was touched upon by one article (van Montfoort, 2019). *"A lot of customers are inclined to get rid of their old stuff and buy new goods to replace this. Afterwards, the 'old junk' is brought to the nearest thrift store"*. This supports the indicated relation between *demand first-hand goods* and *donations*. Philosopher Bas Haring (van Montfoort, 2019) also pointed out the existence of the illusion of usefulness. *"Of course it is easier to throw away your stuff without guilt, if you think 'someone else might use and enjoy it'"*. This is in line with concern respondent 4 voiced, regarding the role thrift stores play in the replacement of first-hand goods.

There is one small aspect that contradicts the experiences of the respondents, which is regarding the acceptance criteria stores have in place. Whereas the respondents pointed out that the acceptance criteria normally do not change if the supply increases, it is stated that *"goods of which a lot of similar items are already in inventory, are often declined"* (van Montfoort, 2019). This is not in line with the reasoning of the respondents, who indicate that if the supply increases, the same acceptance criteria are followed, but a higher standard is set for goods to be store worthy. However, since this is only mentioned once, this does not provide enough support to include an additional relation between the quantity of donations and the acceptance criterium of *reusability*.

4.9 Results of the Analysis
After looking at all the relations and feedback-mechanisms of the conceptual model, certain adjustments have been made. There are three types of changes that have been implemented, which are variables and/or relations that have been omitted from the model, variables and/or

relations that have been adapted and variables and/or relations that have been added to the model.

First of all, certain factors have been deleted from the model (see the red markings in Figure 25). The influences on *donations* that have been omitted from the model are *competition for donations, economic prosperity* and *requesting specific goods*. These relations were not supported based on the findings of this research. By omitting the variable *requesting specific goods* from the model, the relation between *need for specific goods* and *requesting specific goods* has also been erased and feedback-loops B1 and R1 no longer exist as such. In addition, the relation between *donations* and *variety of goods* was not supported in this research. Respondents did not see that the amount of donations had a positive impact on the variety of goods they received. Finally, the respondents also did not notice an effect of the competition they face, on the sales they generate. Therefore, all these relations have been omitted from the model.

In addition to omitting variables and relations, a few changes compared to the theoretical conceptual model have been made to existing variables and relations (see the yellow marked relations in Figure 25). Whereas the literature found usability to be the acceptance criterium for donations, most respondents also accept reusable goods, which cannot be sold. In order to reflect this in the model, the criterium of *usability* has been changed to *reusability*. Another change is the polarity of the relation between *relative price difference* and *the level of second-hand goods substituting new goods*. The respondents suggested that the bigger the difference between a second-hand good and a new, similar good, the easier customers decide to buy the item second-hand. This is in contrast to the theoretical assumption that the smaller the price difference, the bigger the level of substitution. This has resulted in an alteration of the polarity.

Finally, new variables and relations have been indicated by the respondents, that have been included in the results (see the green markings in Figure 25). When looking at the basic structure, a new outflow has been added, called *recycling goods*. This is in line with the changed acceptance criterium, since reusable goods, that cannot be sold, are used for recycling purposes. Looking at the dynamics influencing this basic structure, it can be said that there have been three other additions.

First, the variable *Price/Quality Ratio* has been incorporated in the model. The respondents stated that high quality goods, with a higher price, did not sell slower than

cheaper, lower quality goods. On the contrary, some respondents said that those goods sometimes tended to sell faster. In order to add this dynamic into the model, the variable *Price/Quality Ratio* has been introduced. This variable is influenced by both the *quality, price* and *experience of employees*. The experience of employees determines to a large extent whether or not the goods are priced in accordance with their quality, and thereby if the ratio is in balance. It has also been found that the *price* of a good does not only depend on the *quality of the good*, but on the *state of the item* and comparable *price of a new good* as well. This has also been added to the model.

Second, a new variable, called *goodwill*, has been indicated by the respondents as an influence on *donations*. Whereas *donor motivations* can be seen as an indicator of whether or not people tend to donate goods, *goodwill* can be seen as an indicator whether or not people want to donate to a certain store in particular. Since this dynamic has not been part of the conceptual model, this factor has been included in the revised model as the positive relation between *goodwill* and *donations*.

Third, a new dynamic was indicated by the respondents. It was found that *donations* were also influenced by the *demand for first-hand goods*. The more first-hand goods were bought, the more donations the thrift stores received and vice versa. Moreover, a new feedback-loop is indicated, namely balancing loop B4. This found dynamic also limits the reinforcing feedback-loop R3.

All indicated changes can be seen in Figure 25 below.
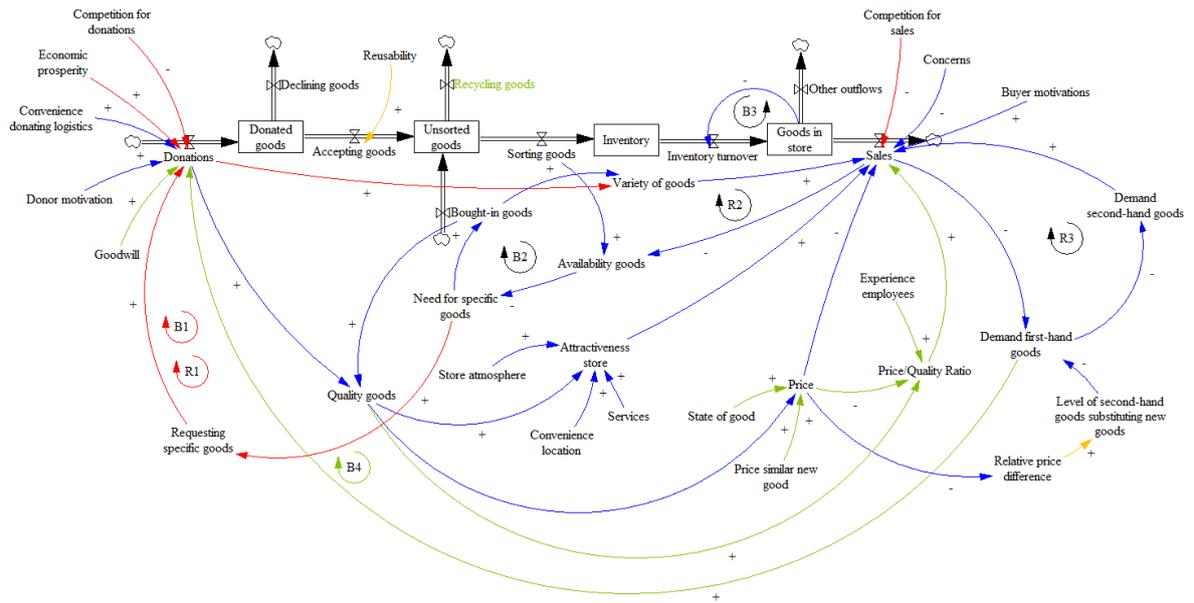
Figure 25. Revised model with indicated changes

Based on these changes, a new model has been constructed, which can be seen in Figure 26. This model visualizes the dynamics underlying the supply and demand in thrift stores. Appendix II contains an enlarged version of the revised model.
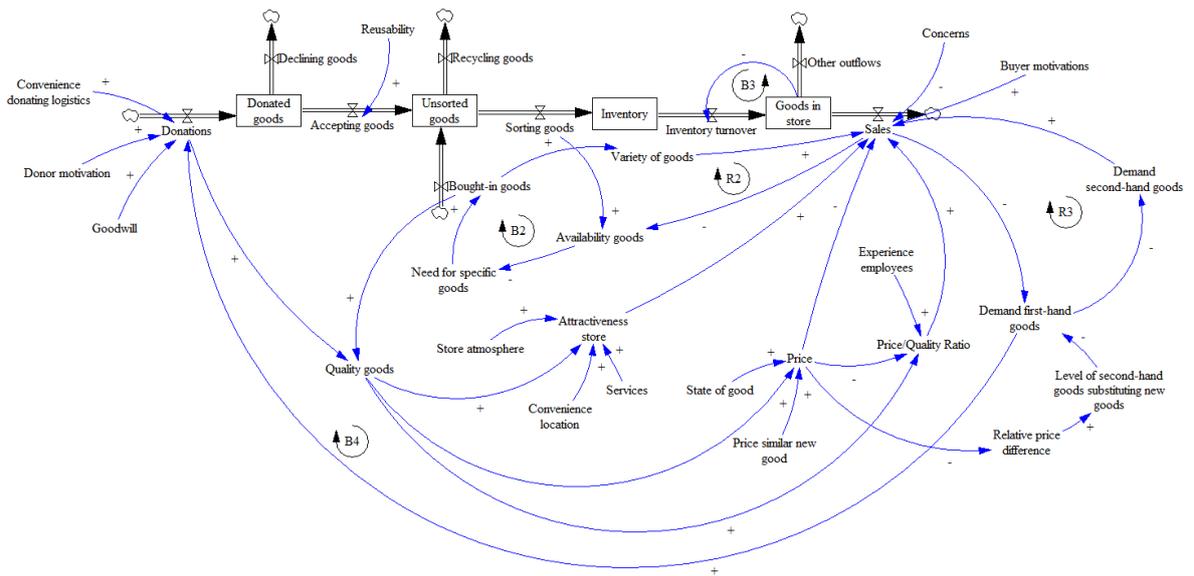
Figure 26. Revised model

5. Conclusion and discussion

In this chapter, the research question will be answered first. By describing the changes made in the revised model, the underlying mechanisms influencing supply and demand are discussed. Hereafter, the implications and limitations of the used theory and methods are elaborated on in the discussion section, followed by the recommendations of this research.

5.1 Conclusion

This research has looked into the dynamics underlying the supply and demand in thrift stores. Thrift stores receive donations in order to resell and be able to facilitate their social and environmental goals (Mitchell & Montgomery, 2010; BKN, n.d.a). Whereas regular retailers, for instance, can manage their supply of goods, thrift stores depend on (irregular) donations and have to respond to these changing circumstances (Mitchell et al, 2009). Thrift stores face a dynamic environment. In order to get more insights in the way thrift stores facilitate reuse of goods, a conceptual model was made, based on scientific literature. This model entails a visualization of the dynamics underlying supply and demand, and as such, connects previously studied aspects of supply and demand in an overarching model. In order to validate whether or not this was representative of the way thrift stores operate, a subset of six thrift stores was selected. Six employees were interviewed and a document analysis was conducted. The semi-structured interviews were analysed to find potential discrepancies between the conceptual model and the experiences of the respondents. Based on these interviews, the conceptual model was evaluated. In order to build more confidence in these findings, an additional document analysis and limited cross-validation was conducted. After this, the revised model was formulated (see Figure 26). This has all been done, in order to answer the main research question:

What dynamic mechanisms lay at the basis of the supply and demand of used goods in thrift stores?

After the analysis of both the interview data and documents, it can be said that supply and demand are influenced by a lot of different dynamics (i.e. feedback-loops, endogenous and exogenous influences). Whereas the supply of goods, via *donations*, is influenced by predominantly exogenous variables, the *sales* of used goods are influenced via feedback-loops, endogenous and exogenous variables. Thrift stores can therefore exert more influence on their own, on the sales of goods, than the acquiring of goods.

Compared to the conceptual model, the revised model shows three types of adaptations, namely the omission, changing or adding of variables. The variables that have been erased from the model are the influences of *competition for donations, economic prosperity* and *requesting specific goods* on *donations*, the relation between *donations* and *variety of goods* and the relation between *competition of sales* on *sales*. Since the relation between *requesting specific goods* and *donations* is omitted, the feedback-loops R1 and B1, have also been excluded. These variables and feedback-loops are not supported by the experiences of the respondents or documents, and thereby deviate from the scientific literature.

The variables that are changed in the model are the acceptance criterium of *reusability* and the polarity of the relation between *relative price difference* and *level of second-hand goods substituting new goods*. The respondents voiced noticing these influences, however, in a different way. A couple of additions have been made to the model as well, since the scientific literature did not discuss these influences but the majority of the respondents did. These additions are the outflow of *recyclable goods* that are accepted, but not put in store, the way the price of a good is determined (*state of good* and *price similar, new good* have been added) and the *Price/Quality Ratio*. This ratio is determined by the price and quality of an item and the experience of the employees. Moreover, two new influences have been indicated by the respondents, which are the positive relation between *goodwill* and *donations* and the positive relation between *demand first-hand goods* and *donations*. By adding this last relation, a new feedback-loop is identified as well, namely B4.

In the revised model there are three balancing and two reinforcing feedback-loops identified. Feedback-loop (B4) can be seen as a central loop in this model. Whereas the other four loops (B2, B3, R2, R3) are part of substructures or are less impactful, the main dynamics stem from the influence of the first-hand market. This differs from the conceptual model and means that the influence of the first-hand market on thrift stores is significant and understudied.

In addition to the found feedback-loops, the dynamics that lay at the basis of supply and demand of used goods in thrift stores consist of exogenous and endogenous variables as well. The exogenous variables that are not part of the feedback-loops that have an influence on supply are *donor motivation* and *goodwill*. *Convenience of donating logistics* influences supply as well, and is the only endogenous variable that influences the donations directly. Exogenous variables that are not part of a feedback-loop and have a direct influence on demand are *concerns* and *buyer motivations* and *price similar new good* is an exogenous

indirect influence on donations. Endogenous variables that influence *sales* indirectly are *experience employees, store atmosphere, convenience location* and *services*. The variables *state of good,* and *quality good* can be seen as endogenous as well. Even though the quality and state of a donated good is beyond the influence of thrift stores themselves, and as such are exogenous, thrift stores do decide themselves which level of quality and state of goods they display in their stores. In addition, some stores buy in goods, and do influence the quality of goods directly. Based on these two findings, thrift stores do have an influence on the offered quality and state of goods in stores and these variables can therefore be seen as endogenous.

Coming back to the research question, it can be concluded that there are three types of dynamics that affect the supply and demand in thrift stores, namely feedback-loops, both balancing and reinforcing, and endogenous and exogenous variables. The combination of these variables and relations drives the supply and demand, and thereby the facilitation of reuse of second-hand goods.

5.2 Discussion

In this section, the implications and limitations for the used scientific literature and methods are discussed, followed by recommendations for further research and the thrift store branch.

5.2.1 Theory

Looking back at the used theory and findings, different implications and limitations have been found.

Overall, it is found that the results of this research differ from previous scientific literature in multiple ways. A main difference is the introduction of the complexity thrift stores face. The classical economic perspective on supply and demand assumes that there is an isolated relation between the price and quantities supplied and demanded and other previous research has also mostly focussed on isolated aspects. By using a System Dynamics approach, this research combined these insights into an overarching model. As can be seen in the model, a large share of the variables is connected to at least one other variable, which means that a change in one variable, could result in a chain of events. This research shows that thrift stores face complexity, and that employees should be aware of this structure.

More specific discrepancies or insights have been found for the concepts discussed in the theoretical background (i.e. reuse, thrift stores, supply and demand). Going into more detail on the concept of reuse, most of the used theory has been verified by the experiences of the respondents. As pointed out in the theoretical background, reuse is beneficial for the

environment, since new goods of virgin material do not have to be produced (Ellen MacArthur Foundation, 2013). However, for that to be the case, second-hand goods must replace first-hand goods, and the supply and demand have to be in a certain balance. The findings of this research support this. Most respondents point out that they see and believe that first-hand goods are substituted to some extent. Yet, as is pointed out in the literature, by respondent 4 and philosopher Bas Haring (van Montfoort, 2019), donating goods to thrift stores could also result in people buying more first-hand goods. This is not only due to the generation of possible revenues (Fox, 1957), but also because people do not feel guilty for disposing their old goods (respondent 4, van Montfoort, 2019). Therefore, the assumed dynamics found in the literature, are further supported.

Regarding the theory on thrift stores, little was incorporated in the conceptual model. As pointed out, the goal of thrift stores is to resell used goods, to support their environmental and social goals, which was the basis of the conceptual model. In the section on thrift stores, it was assumed that this goal was complicated by the *competition* thrift stores face for both the acquiring and selling of used goods. However, in practice, this competition is not felt by the respondents. The theory on competition, can thus be amended by adding the importance of available goods. Even though thrift stores do face competition, the effects hereof are negligible, due to the availability of used goods and other factors. Therefore, the previous theory on competition was not all-encompassing.

When looking at the theory regarding supply of goods, the findings of this research show that not all previous insights are accurate any more. Whereas theory indicated a positive effect of *requesting goods* on *donations*, this research refutes this. Only one store indicated to sometimes request specific goods and when they did, it only had little effect. Moreover, asking for specific goods could also have negative consequences, since donors might bring unusable goods. As a result, the theory on requesting goods should be revised. In addition, based on these findings, thrift stores do no longer have to invest in requesting goods, and should not set expectations too high, if they do ask for it.

After evaluating and elaborating on previous insights on demand, it is found that the negative polarity of the relation between *relative price difference* and *level of second-hand goods substituting for new goods* is not supported. This is a discrepancy between previous theory and empirical practice. Whereas Thomas (2011) assumes that a large price difference between second-hand and new goods, might indicate an inferior product to customers, the respondents did not notice this in their stores. This means that the theory on relative price

difference and its influence on the level of substitution is not supported and should be amended.

Finally, it is found that thrift stores have a limited influence on the supply of goods. When looking at the revised model, it can be seen that the supply almost fully depends on exogenous variables. The only variables thrift stores can influence directly to influence the supply, are the *convenience of donating logistics* and *buying in used goods*, although this is not always a preferred option. Thrift store employees thus have a limited range of options to increase supply. The revised model also shows that it could be more beneficial for thrift store employees to focus on influencing *sales* of second-hand goods, instead of the supply, since thrift store employees are able to influence the sales more directly than the donations. Instead of increasing the reuse of goods via increasing supply, focussing on sales of unsold second-hand goods could be beneficial as well. Not all displayed goods in stores get sold, so stimulating customers to buy more second-hand goods instead of first-hand, can contribute to the reuse of goods just as much.

Looking back at the used theory, a couple of limitations should be taken into account, while interpreting the results and implication. A potential weakness of this research is that this model is not all-encompassing. The conceptual model is based on concepts described in scientific literature. Since the scientific literature on supply and demand in thrift stores is limited, potentially relevant factors that have not yet been researched, were not included in this research. It can be assumed that influential factors were left out of the model. Therefore, this model should be seen as a starting point and it can only be concluded that this model is representative of reality to a certain extent. However, in light of the research objective of this research, which is to contribute to knowledge on reuse by provide knowledge on the new domain of underlying dynamics that influence supply and demand, the researcher believes that the potential exclusion of influential factors is justified.

Another limitation of this research is the assumption that sales of used products equal reuse. To make this research manageable, this equalization has been introduced. This research aims to provide knowledge on the dynamics that influence the facilitation of reuse, and used sales as a derivative, whereas this does not have to be true. However, in light of the feasibility and comprehensibility of this research, the researcher still supports this simplification.

5.2.2 Method

This research has used a System Dynamics perspective and a case study approach, to come to a revised model. As Yin points out (2014, p.4), case studies arise out of the desire to understand complex phenomena. A multiple-case study was chosen due to the opportunity to compare multiple cases and, as a result, provide more robust findings. This research has obtained knowledge on reuse, by capturing the circumstances and conditions that influence the supply and demand in thrift stores. Moreover, it has shown that using a case study approach in combination with System Dynamics can result in additional theoretical knowledge explaining complex issues.

Using System Dynamics to combine previous insights into an overarching model, has resulted in the amendment of certain previous insights, as well as provided new insights in the dynamics of supply and demand, both the relations between influences and entirely new influences. Using System Dynamics as a method has resulted in a visualization of dynamic mechanisms, which provided new insights in ways to influence the reuse of goods in thrift stores. Since this was the research objective, it can be said that this method was suitable for the aim of this research.

Whereas System Dynamics usually tends to focus on endogenous factors only (Richardson, 2011), this research included exogenous factors in the stock and flow diagram as well. Visualizing and examining the influences of exogenous variables has proven to be useful as well, since the incorporation hereof, has resulted in rejecting assumed influential factors, such as *economic prosperity*. As a result, it can be said that even though exogenous variables cannot be influenced by an entity itself, looking into these influences can still be of use.

However, the selected used methods and selection criteria come with their own limitations. A known limitation of case studies is the problem of external validity, due to the intrinsic design of case studies. In order to transcend the limited generalisability, the concept of analytical generalisability was applied in this research. By distinguishing between case specific data and more general applicable data, the revised model aims to not only represent the included respondents, but a general visualization of dynamics thrift stores encounter.

Another limitation is the sample size of this research. Due to the feasibility of this research, only six members of thrift stores have been interviewed. Besides, no individuals, either people who bring goods or buy goods, have been interviewed as part of this research.

Parts of the conceptual model, regarding donor- and buyer motivation for instance, have been validated based on the insights of the respondents and selected documents. By interviewing customers, additional insights could have been found, such as personal characteristics or entirely new influences, of which it is unclear if they would have been in line with the found mechanisms by this study.

In addition, the selection criteria for the respondents and documents could have been sharper. In hindsight, some criteria were not thought out enough. A criterium for selecting respondents, was that they had to work at least one year in the thrift store branch. However, this proved to be too little. The assumption was that employees who had been working for over a year, would have seen different influences and states of supply and demand. However, since Covid-19 already lasted over a year, the experience of a respondent who had been working there for a little over a year, were limited in some aspects. Whereas this was only the case for one respondent, it would have been better to select respondents which had been working in the thrift store branch for a longer time, for instance five years. This also applies for the selected documents. Since the selected documents had to be written between 2018 and 2021, a substantial share of the documents was written during Covid-19. Some documents, for instance, referred to a large surplus of donations. However, it is not clear whether or not this was an ongoing trend, or the result of Covid-19. During the analysis, the researcher has carefully tried to limit the influence of Covid-19, since this is an exceptional situation, while still making sure the revised model applies to this situation as well. Therefore, it could have been more informative if the documents had to be written between 2016 and 2021.

Finally, the interviews and document analysis have all been gathered, transcribed, coded and analysed by one researcher. This could have resulted in the researcher's own norms and values playing a part in the analysis. The subjectivity of the researcher could have influenced the way the analysis was conducted. In order to limit this influence, all interviews have been transcribed verbatim, to make sure the information was captured carefully and to make sure the analysis is more traceable. Moreover, a member check has been conducted. All the respondents have had the opportunity to look at the results and give feedback on it. The remarks have all been taken into account.

Looking back at this research, choosing System Dynamics as a lens to look at the supply and demand has been an interesting choice. It has resulted in new knowledge and a way to visualize the intricate web of relations of influences. However, the findings of this research would have been more accurate if the sample size was bigger and broader. After seven

interviews, saturation had not occurred. In addition, the interview questions could have been more in line with the model. Sometimes, the relations were not asked about elaborate enough, whereas the state of a variable was talked about extensively. Finally, the efficacy of including a document analysis in this research is also questionable, since the criterium to include only documents between 2018 and 2021, caused the documents to mainly focus on the effects of Covid-19.

5.2.3 Recommendations

In light of the theoretical and societal relevance, a few recommendations are given. The societal relevance of this research is to stimulate reuse in thrift stores, which can contribute to the limitation of the environmental burden of goods. It was suggested that thrift store employees could use the found insights to adapt their policies, if necessary, to increase the reuse of goods. This research has provided more insights in the way thrift stores facilitate reuse, by zooming in on the way supply and demand of second-hand goods is influenced. It is found that thrift stores have little impact on the supply of used goods, but could focus on optimizing the sales of used goods. By providing insights into the dynamic mechanisms that thrift stores can influence themselves, thrift store employees might be able to allocate their (limited) resources to the most beneficial instrumental variables.

Since thrift stores only have a limited influence on the supply of used goods, allocating a lot of resources to this purpose seems inefficient. Whereas it is important to keep an eye on the potentially changing inflow of donations, it can be beneficial to focus more on increasing sales, in order to facilitate reuse. It is recommended to be aware of the possibility for futures in which the supply of donations is not sufficient, and to see if investing in convenient donating logistics is worth the investment. Additionally, it is recommended to look at variables that can be influenced to increase sales, such as offering a fair *Price/Quality Ratio* and an *attractive store,* in order to facilitate more reuse.

Regarding the theoretical relevance of this research, it can be concluded that this research has contributed to the knowledge on reuse, by providing an initial overarching model, covering the dynamic mechanisms influencing the supply and demand in thrift stores. As a result, previous insights have been re-evaluated and were either supported or rejected. In addition, new relations have been identified and added to the model, creating an amendment of the previous theory regarding supply and demand in thrift stores. These new insights call for further research.

Another recommendation would aim to validate the revised model even further. Due to the limited scope of this research, the findings of this research should be seen as a starting point for further research. The conceptual model was validated based on a selective sample size, which could be elaborated on. Further research could try to validate this model even further by including other type of respondents as well. As pointed out in the limitations, interviewing customers, either people who donate goods or buy goods, has not been part of this research. It could be interesting to include this group of people, since they can validate parts of the model that affect them, and can give additional insights into the specifics of why they tend to donate or buy second-hand goods or in a particular thrift store.

It could also be interesting to do quantitative research. Whereas this qualitative research has looked into the factors that cause a dynamic behaviour, it could also be valuable to quantify these findings. By quantifying the model, the strength of certain feedback-mechanisms or influences can be assessed. As already pointed out in this research, bought-in goods are an uncommon way for thrift stores to acquire used goods. However, it can be valuable to find out which factors have a big or small influence on the supply and demand, in order for thrift stores to anticipate what could be useful for them to take into account with regard to their policies.

In addition, the findings of this research suggest that thrift stores have little influence on the supply of donations. It could be interesting to see if there are other ways thrift stores (try to) influence their donations, since those potential influences could also contribute to the balance of supply and demand and an increased amount of reuse.

Furthermore, since there is a discrepancy found between regarding the polarity of the relation between *relative price difference* and *the level of substitution from buying second-hand goods instead of new goods*, the current theory of Thomas (2011) was falsified. Since this incongruence occurred, it could be interesting to look at this relation more in dept. By researching when and how this works, this could result in new insights and a further specification of this model.

Finally, future research could also focus on specific findings of this research. It could, for instance, be interesting to look deeper into the suggested variable *goodwill* and the relation between *demand first-hand goods* and *donations*. A lot of respondents have pointed out the importance of this and this is used as an addition to the model. However, scientific research has not yet researched this in depth. More extensive research could result in finding out which

and why goodwill achieves certain effects, and if and how customers experience this. Moreover, researching the influence of the first-hand market on donations could possibly help thrift stores to prepare for potential future challenges with regard to donations. This could both result in valuable new insights.

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Appendix I – Conceptual model
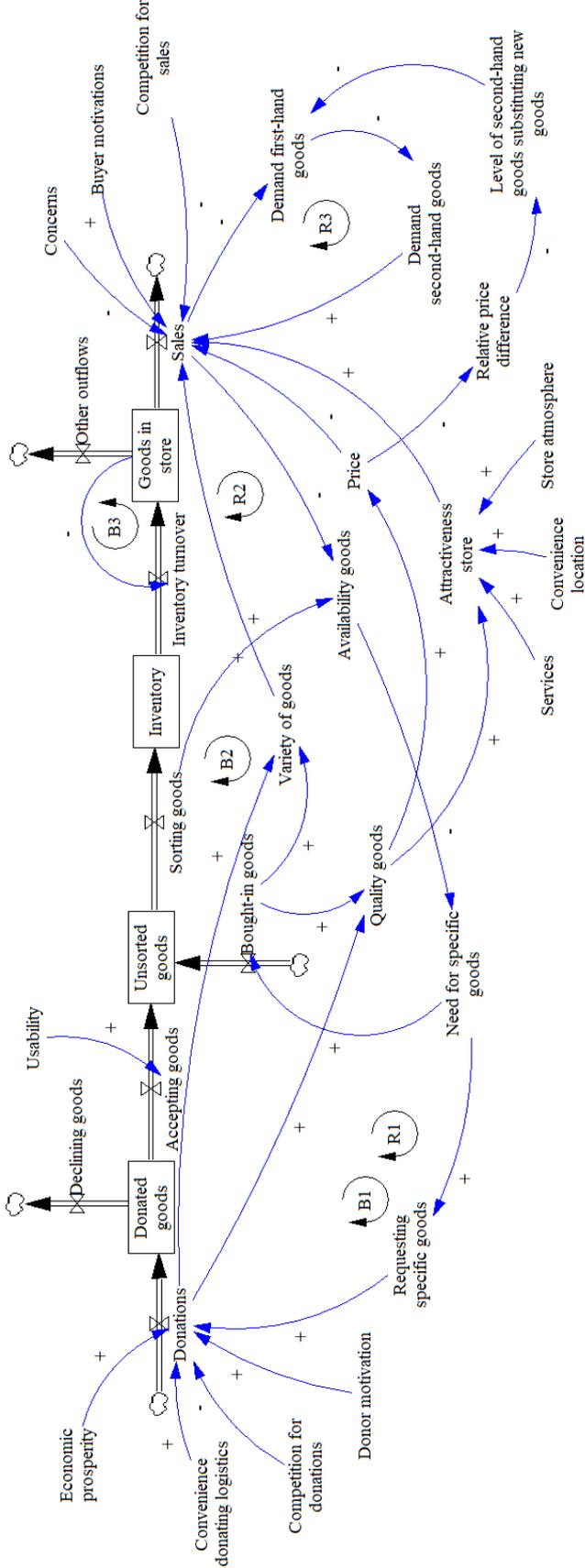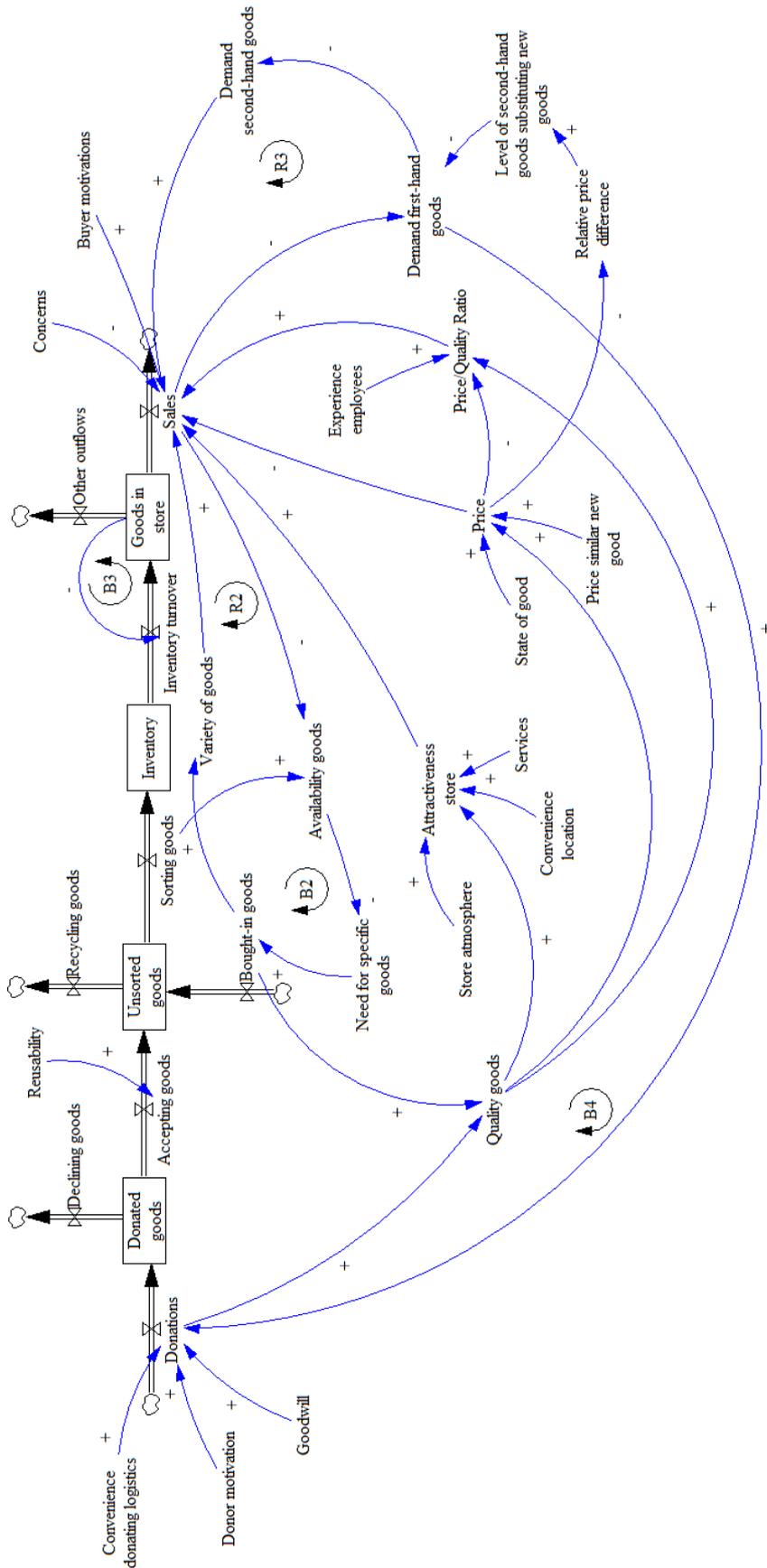
Appendix III – Interview guide

N.B. This interview guide is a translation of the Dutch interview guide that was used for the interviews. The interviews were with Dutch respondents and the original questions were asked in Dutch.

General instructions for the interviewer

As an interviewer, it is important to make sure that the interviewee feels comfortable. Making sure the ambiance is relaxed, can attribute to interviewees answering the questions honestly, which is necessary for the contributions of this research. The interviewer should always stay friendly and respectful towards the interviewee. It is also necessary to obtain enough information on the posed questions. If the interviewee answers in a closed, short way, it is important to keep asking further, especially since the dynamic relations between variables are important to figure out. Questions that could be helpful are "Could you elaborate on this?", "What do you mean by this?", "Could you give an example of this?" or "Why do you think this happens?".

General instructions for the respondents

Dear, mister/madam [name respondent],

My name is Hadewych van Reeuwijk and I am studying the Business Administration Master, Business Analysis and Modelling at the Radboud University. For my master's thesis, I am researching what underlies the supply and demand in thrift stores, and how that influences each other. I would like to acquire more insights hereof.

First of all, I would like to thank you for your time and cooperation and your contribution to this research. In this study, I try to visualize all the relevant interactions that influence the supply and demand of used goods in thrift stores. With this interview, I hope to get a better understanding of the daily business you face and your experiences regarding changing supply and demand.

The interview data will be processed anonymously, but it could be possible that, based on the number of stores your organization has, the organization might be recognizable. The storage of data is confidential, and only accessible for my two supervisors. After my analysis, I will share my findings and used quotes with you, after which you will have the opportunity to correct anything I misrepresented, or you do not want to share. If you think something is unclear, or you prefer to not answer it, or you want to stop, please say so. If you have any

feedback, I would appreciate it if you would share it with me. Before we start, do you give consent that I record this interview? Do you have any questions for me, before we begin?

Now we will start. This interview consists of two parts, which are about the second-hand goods that you receive and the sales hereof. Before we begin with these topics, I have a couple of general questions.

1   What is your function within [name thrift store]?
2   How long have you been working within [name thrift store], or the thrift store branch?
3   How many stores does this thrift organization have?

> 3.2 How many of those stores, are you involved in/have insight in?

Thank you. Now I would like to discuss the way [name thrift store] receives her goods and which influences you notice.

4   What are ways in which you acquire used goods?

I would like to dig a bit deeper into the ways you acquire goods, starting with the donations you receive.

5   What reasons do you notice, why people tend to donate their goods?
6   If you could choose from the following categories, how would you describe the quantity of donated goods (both in stores and picking up at homes etc.)? Little, sufficient, more than sufficient, quite a lot, or a lot.

> 6.2 Do you see a development in the amount of donations you receive?
>
> 6.3 What do you think has influenced this development?
>
> 6.4 You pointed out that you notice this trend in the amount of donations, do you see a change in the variety of donated product types as a result?
>
> 6.5 Do you see an accompanying trend regarding the quality of donations?
>
> 6.6 How do you think the donations will develop in the coming years? Why?

7   Now leaving the quantity of donations aside, do you see a trend in the quality of donated goods you receive?

> 7.2 Which development do you see?
>
> 7.3 Why do you think this happens?

8   Which development do you notice regarding the variety of offered product types?

> 8.2 Which factors do you think have played a role in this?

9   Let's move to something else, do you use acceptance criteria?

9.2 What are those criteria?

9.3 Where are the criteria based on?

9.4 Are there instances which cause the acceptance criteria to change?

      9.4.1   Which are they? (For instance, ask about large amounts of donations)

      9.4.2   In that case, what would happen to the acceptance criteria?

10 I assume that the supply of goods changes daily, and that this is not only the quantity, but the quality and variety of goods as well. Do you recognize this?

    10.2   Do you try to anticipate on this in any way? Which way? (Think about thinks like storage or requesting goods).

    10.3   Have you ever put out a request for specific goods?

      10.3.1 Why have or haven't you done this?

      10.3.2 Based on what did you decide which goods to include in the request?

      10.3.3 What was the effect of your request, regarding the amount of donated goods?

      10.3.4 Did you notice other (side-)effects as well?

11 I have read about the influence of convenience of donating logistics on donations, do you recognize this?

    11.2   In which way did you notice an effect of the convenience of donating logistics?

12 To what extent do you notice an influence of the economic state (prosperity or crisis) on the donations you receive?

    12.2   In which way do you notice this influence? (For instance regarding quality, quantity and variety of goods)

    12.3   Are there instances in which this did not occur the same way?

    12.4   Why do you think this is the case?

13 To what extent do you face competition for donations of used goods?

    13.2   In which way does that affect the amount of donations you receive?

14 Do you think there are other factors that influence the donations you receive?

    14.2   What kind of effect does that have?

I have read about some thrift stores that buy in goods.

15 Do you sometimes buy in goods?

      15.2   Why do or don't you buy in goods?

      15.3   What kind of goods do you buy?

      15.4   Which (quality)criteria do you use for these goods?

      15.5   Are the goods you buy in used products or new?

      15.6   What do you notice regarding the sales of these bought in goods?

16 You did (not) point out that you receive goods in any other way. Do you use different acceptance criteria for these goods?

17 I have one more question regarding the acquiring of goods, after goods have been donated,, which steps are taken before goods enter the store to be sold?

      17.2   Is there a difference per product type? (For instance, testing electrical appliances)

      17.3   Based on what, do your goods get priced?

      17.4   Based on what, do you decide which goods are put in store?

      17.5   What happens if the inventory is full?

Thank you for this elaborated information on the way you acquire used goods. I would also like to know a bit more about the sales and demand for your goods.

18 Which ways do you sell your second-hand goods? (In stores or online, for instance).

      18.2   If you sell goods online as well, do you see a change in the quantity of sold goods?

19 What happens to the goods that are not sold?

      19.2   Do some goods go back to the inventory?

      19.3   After how long is a good considered 'not sold'?

20 Do you notice a development in the amount of sales, based on the quality of your products offered?

      20.2   What is this development you notice?

      20.3   Why do you think this is the case?

      20.4   If the quality of a good is higher, will the price reflect this?

      20.5   If both the quality and price of goods are higher, what do you notice regarding the quantity of sales?

21 What do you notice regarding the sales, if there is a wide variety in your assortment?

      21.2   Is there a development in this?

      21.3   Why do you think this is?

You might encounter more influences on the sales of second-hand goods.

22 To what extent do you think the attractiveness of your store(s) has an influence on the sales of second-hand goods?

23 What are reasons you hear why people do not buy second-hand goods here or in general?

24 Another think I am interested in, is the competition you face regarding the sales of used goods. In which ways do you notice an influence of this competition on your sales?

We are coming to the final part of the interview.

25 Thrift stores offer used goods a second life, so in theory, no new goods have to be bought. Do you agree with buying second-hand goods can replace buying first-hand goods?

> 25.2 Under which circumstances do you think this is?
>
> 25.3 Do you think the price of a second-hand good has an influence on this?
>
> > 25.3.1 How do you think this influence works?

26 Do you think there are other, unappointed factors that might influence either the donations or sales of used goods?

These were my questions for you. Do you have anything to add or want to ask me?

It all sounded very clear, thank you. I will come back to you after my analysis, which will be in about three or four weeks, just before I finish my thesis. If I have interpreted something wrong, I can adjust that before I hand my thesis in.

Finally, I would like to thank you again for your time and cooperation.

Appendix IV – Codes Atlas.ti

IV.I - List of codes

	Name	Grounded		Density		Groups
○	Acceptance criteria		81		0	
○	Altruistic reasons		41		1	[Donor motivation]
○	Attractiveness store		11		0	
○	BIG Extend		11		1	
○	BIG Motivation		12		1	
○	BIG quality		3		0	
○	Bought-in goods		12		2	
○	Buyer motivation		7		0	
○	Competition for donations		57		0	
○	Competition for sales		47		0	
○	Concerns		21		0	
○	Demand 2ndhand goods		7		0	
○	Donor motivation		2		2	
○	Economy		31		0	
○	Environmental		22		0	[Buyer motivation]
○	First hand goods		62		0	
○	Hedonic benefits		35		0	[Buyer motivation]
○	Inventory		4		0	
○	Convenience location		49		0	[Attractiveness store]
○	Logistics		54		0	
○	Price		143		0	[Buyer motivation]
○	Quality goods		163		0	[Attractiveness store]
○	Quantity goods		221		0	
○	Requested goods~		8		2	
○	RG Effect		3		1	
○	RG motivation		7		1	
○	Self-Interest~		57		1	[Donor motivation]
○	Services		45		0	[Attractiveness store]
○	Steps process		144		0	
○	Store atmosphere		106		0	[Attractiveness store]
○	Uniqueness		24		0	[Buyer motivation]
○	Variety goods		125		0	
○	Which way		78		0	

IV.II – Visualization coding in Atlas.ti

IV.III – Visualization analysis