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Strategic positioning of family business brands: a cross-country application to the wine sector

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Abstract

Purpose: Little knowledge exists about stakeholder perceptions of family business brands. Particular gaps remain with respect to research on consumers which represent a key stakeholder group of many family firms. The nature of vast existing research is theoretic and evidence has been anecdotal. This work aims to address these knowledge gaps in the field of family business brand research.

Design/methodology/approach: A survey by questionnaire among regular wine drinkers has been carried out in Australia, Italy and the United States of America. Covariance-based structural equation models as well as logistic regression models have been used to empirically test a theory-driven framework.

Findings: Results indicate that consumers attach significant value to the family firm attribute in all three countries and indicate their willingness to pay a premium price for wines produced by these firms. It can be shown that consumers hold characteristic associations with family businesses that are the origin of this premium and also lead to increased behavioural loyalty intentions towards these businesses. Family businesses consistently rank higher than their non-family counterparts for the tested attributes. However, it can be shown that cultural differences contribute to a differential rank order of these attributes, and in some cases even cause an inversion of effects on behavioural outcomes.

Practical implications: Family businesses enjoy an exceptional reputation as they build trusting and satisfying relationships with their clients. Findings imply that these unique characteristics of the family firm brand represent a potent competitive advantage in the marketplace. However, agency theory suggests that market conditions causing adverse selection of family business may exist which leads to a welfare loss of market players.

Originality/value: For the first time a multivariate analytical framework grounded on significant work in the field of marketing explains the chain of effects of family firm image on consumer behaviour. Replication across three countries adds robustness to the findings and for the first time addresses how cultural differences affect the perception of family firms. Results provide important implications about the positioning of family firm brands in consumer markets.

Keywords: family, business, brand, image, consumer, wine, sem, dce

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Chapter 1

Introduction

1.1 The role family firms play in today's economy

Family businesses play a pivotal role in the world economy and are a main driver of job creation in many countries (e.g. Astrachan and Shanker 2003). Even the economies of industrial nations are clearly shaped by family firms. Past research executed in countries such as Germany (Klein 2000), the Netherlands (Flören 1998), Switzerland (Frey et al. 2004) and the United States of America (Astrachan and Shanker 2003) consistently finds that the vast majority of small and medium enterprises are family-owned and run. In line with the extant body of literature, an earlier data collection by the author conducted among family-owned businesses in the Australian, German and Italian wine sector (Köhr et al. forthcoming) shows that these firms employ a total staff of 9.6 on average. Earlier studies in the field of family business research find that family businesses represent between 83 - 88 percent of businesses in a country and about 70 - 78 percent of businesses in a country have been found to be family businesses that employ less than 10 people (Flören 1998, Frey et al. 2004). This structural overview implies that the vast majority of companies in the wine sector can be assumed to be family firms.

Family businesses are deeply rooted in their local environment. This local nature of family firms plays an important role due to the positive externalities of these businesses on the local environment they are embedded in (Berrone et al. 2010). Dedicated research in management pinpoints that these positive externalities emanate from a strong stakeholder orientation (Arregle et al. 2007) of family firms. The favourable behaviour of family busi-

nesses towards stakeholders is commonly attributed to the strong link between the family and the business subsystems. This internal organisation of resources reduces the presence of agency problems between firms and their stakeholders. However, family businesses are confronted with several challenges in today's fast-paced market environment. As most family firms are small and medium companies, these businesses are at a relative disadvantage with respect to their access to capital (Gallucci et al. 2015), and consequently face financial constraints more severely than publicly-traded non-family companies. From an agricultural angle, family-centred rural communities are the core of dedicated local knowledge about production practices, which have given birth to distinct local culinary cultures and represent an important element of local patrimony. This knowledge has often been passed on over generations. However, Fonte (2008) warns that rural communities have been expropriated from the benefits of the valorisation process of this knowledge and initiatives by public institutions have failed to protect the valorisation of local knowledge within its communities and in some cases even have excluded small producers from the valorisation of their local products. Emerging large multinational companies are gaining grounds in many product categories, causing many small competitors to disappear. Similar consolidation pattern can be observed in the wine sector (Orth et al. 2007). This consolidation has profoundly impacted the industry structure in Old World and New World wine production countries. For instance, the wine sector in Germany has seen a strong consolidation, which is reflected by a decreasing number of wine growers (−9.6 percent in the 2010-2015 period, Deutsches Weininstitut 2017) while the overall production area has remained relatively stable (+0.1 percent in the same period). The situation in Australia is similar. Industry census data in GWRDC (2011) and Wine Australia (2017) reveal an ongoing "contraction phase" (GWRDC 2011) of the industry. The development has led to a declining number of grape growing businesses (−6.8 percent in the 2010-2016 period) and a stabilising number of wineries (+2.0 percent in the same period) in Australia.

Despite the wide prevalence of family businesses has been pointed out by past research, little knowledge exists about consumer perceptions of family businesses at this point of time. Understanding consumer needs and consumer attitudes towards family firms is vital to develop mid- and long-term strategies for these businesses and define their positioning in the marketplace (Esch 2008, Wielsma 2015). Recent evidence encourages the development of dedicated strategies for local firms that are not solely based on economies of

scale and scope to ensure long-term firm survival (Steenkamp and de Jong 2010). Family firms are naturally equipped with a very distinct identity due to their specific ownership and the implications this ownership structure has on the way this type of companies can operate. However, to this date little research has explored the characteristics that can set family firms apart from their non-family counterparts from a consumer point of view.

1.2 Deriving equity through brands

1.2.1 Origins of the brand concept

From today's perspective branding is one of the most important marketing tools. Its origins date back centuries when manufacturers of machinery wanted to protect their reputation from low-quality product counterfeit or individuals wanted to designate the ownership of goods (Murphy 1992). As the physical quality of products became more homogeneous over time, branding as a sole means of differentiation based on ownership and product quality became an insufficient tool. Instead, a concept of augmented branding extended the product-centred brand concept with additional components that constitute value from a stakeholder point of view. However, it can be established that in the wine sector that brands still provide guidance about intrinsic product characteristics, such as taste, which can only be evaluated post-purchase (cp. section 2.2.2). This first role of branding is complemented by another important element which relates to the possible self-expressive role of brands for their users (Aaker 1999). It is further commonly agreed that brands can be associated with human characteristics, particularly as the branding of hedonic products is concerned. This augmentation of the brand concept has made brands "powerful repositories of meaning purposively and differentially employed in the substantiation, creation, and (re)production of self" (Fournier 1998, 365). The increasing role of experiential and self-expressive values can also be paralleled with Maslow's (1943) hierarchy of needs. Following this rationale consumers seek particularly experiential and symbolic benefits once their functional needs are satisfied. In the following it will be argued how family firm brands can address these different categories of human needs.

1.2.2 Brand equity

Brand equity is a central concept in brand research and refers to the monetary premium a business can generate through its apparent name compared to other generic substitutes. Keller (1993, p. 3) argues brand equity constitutes when consumers are familiar with a brand and hold positive associations about this brand in their memory. Hence, brands can be characterised as sets of meanings and beliefs towards a related entity. Distinctive sets of associations create a differential towards competitors and serve as a means of brand differentiation in the marketplace. Theory assumes that stakeholders which hold a positive view of an individual brand are more likely to favour one brand over another one. Building brands with a strong and favourable identity has been one of the foremost goals among practitioners in marketing due to the benevolent effects for a company associated to it (Keller 1993, Kim et al. 2003). The process of branding involves the use of a set of different brand elements. The role of these elements is two-fold: First, brand elements create distinctiveness of a brand for its stakeholders in the marketplace. Second, brand elements serve a transcendent purpose through adding a specific meaning to the branded entity. Researchers, such as Aaker and Keller have driven the development of theoretic frameworks about brands from an academic perspective. Foremost interest of academics and industry has been focalised towards the awareness and image of brands as drivers of brand equity (Aaker and Biel 2013, Keller 1993). These dimensions exhibit relational interdependencies with the way customers connect to a brand and hence are a key component of a brand's equity. In case a stakeholder group is constituted by customers, this kind of brand equity is called customer-based brand equity. In order to establish a brand with strong equity, companies have to deliver strong informational cues aimed to constitute a meaningful brand image in minds of stakeholders. These cues have to be valuable, inimitable and non-substitutable to shape up a resource for a firm (Barney 1991). If such customer-based brand equity should become a meaningful resource on the long run, firm strategies may not be in conflict with the image external stakeholders associate with a brand. Hence, the identification of central elements that consumers associate with a brand and their embeddedness in a firm's identity is key to achieve a compelling positioning that is different from competitors and creates a strategic resource in the marketplace (Blombäck 2009, Esch 2008).

1.3 Family firm identity as brand equity tool

While some areas in family business research, such as succession and governance, have been intensively studied in the past, other areas, such as marketing and branding have been touched only recently upon (Babin et al. 2017). A key issue in scientific research in marketing is focusing on the "identification of brand image elements that are likely to impact changes in consumer behaviour and brand equity" (Aaker and Biel 2013, 77). Family firm image is an informational cue that can differentiate a firm from its competitors (Beck 2016). Such differentiation constitutes a strategic resource as it leads to a competitive advantage by influencing behavioural outcomes of stakeholders (Blombäck 2011). Following a resource-based view (Barney 1991) it can be argued that "family brand identity can be regarded as a rare, valuable, imperfectly imitable, nonsubstitutable resource" (Craig et al. 2008, 354). This view is supported by qualitative evidence, which finds that consumers connect distinct associations and views to family firms. These associations are thought to influence behavioural outcomes towards this group of firms (Carrigan and Buckley 2008). Despite family businesses are considered to be the predominant type of enterprise globally, Wielsma (2015) pinpoints the lacking knowledge in the academic community about the influence of family identity of a firm on the corporate brand and its consequences evoked by related antecedents on stakeholder behaviour. Although qualitative evidence suggests that family businesses should promote their familiness, little is known to this date about consumer preference for this type of company (Carrigan and Buckley 2008) and "there is little research investigating the associations and impressions the 'family business' cue evokes with customers" (Orth and Green 2009, 248). Similarly, Blombäck and Botero (2013) conclude in a meta-analysis of past academic work on family firm identity that there is little knowledge about the effects of family firm identity on customer behaviour. Due to its high relevance, yet little exploration, leading scholars in the field encourage research on "identity, branding, marketing, communication and other theories and approaches that may be helpful in explaining the potential antecedents and consequences of promoting the family nature of a business, facets of family firm identity and family firm image and reputation, as well as the relationships between the family and the business in the above-mentioned contexts" (Babin et al. 2017, II).

Despite prevalent shortcomings in the field, recent research provides first quantitative evidence that implementation of family-based branding strategies positively affects firm

performance (Gallucci et al. 2015). The authors point out the importance of family-based branding strategies at corporate level. At a product level, however, Gallucci et al. (2015) cannot identify any significant effect of such strategies on firm performance. Following the theoretic framework of family-based branding strategies of Blombäck (2009), family business brands may be understood as brands at corporate level. This concept is in line with the findings of Gallucci et al. (2015). Adding to this, Blombäck (2009) conceptualises the family characteristic of a business a secondary category brand (cp. Aaker 1996, 289). This secondary brand concept of Blombäck links the family business category brand to the corporate brand and thereby provides a means of differentiation from direct competitors. The specific framework assumes an induced image transfer of the family business category brand to the corporate brand of the business. In this setting the use of "references to family business resembles the use of an extra brand to support the association base of a focal, corporate brand" (Blombäck 2010, 9). Such transfer of image requires the existence of a distinct family firm image among stakeholders. Since family firms are deeply rooted in society and are linked to cultural heritage in the wine sector in particular (Beverland 2005), the investigation of such effect is of immediate relevance in the wine category.

1.4 Contribution of this study

Beck (2016) has shown in a recent meta-analysis about brand management of family firms that much past research in the field has focused on conceptual papers and business-facing studies. However, consumer studies have been scarce in the past and to this point, evidence has been mostly anecdotal (Orth and Green 2009). More recent quantitative studies, such as Lude and Prügl (2018), Beck and Kenning (2015) and Binz et al. (2013) provide evidence that the distinct identity of a family firm strengthens consumer preference for the products offered by these businesses. Hence, family businesses are in a unique position to leverage their family identity in strategic activities. However, it is still unclear how family firms are perceived to differ from their non-family counterparts. Little knowledge exists on how family firm image influences associations of stakeholders, brand relationships and behavioural outcomes (Sageder et al. 2018). For these reasons it has been commonly suggested that future studies in the field need to investigate related effects on consumer choice and develop models that reflect the mechanistic relationships related to the family attribute (Felden et al. 2016, Gallucci and D'Amato 2013). Ad-

vancing related knowledge is important as it has been shown that consumer awareness of a brand is not enough to ensure its longevity. Esch et al. (2006) consider that the relationship of a brand to its stakeholders is key to sustained success. Family business consultants and managers have requested academics to investigate this topic further (Beck 2016). They point out that advancing related knowledge about stakeholder perceptions of family firms helps these businesses to "come from a pure price-driven discussion to a value-driven discussion with customers and other stakeholders" (Beck 2016, 244). Hence, it remains subject to future research how firms can develop a family-based brand identity that establishes a competitive advantage in the marketplace and which variables are the most important ones (Cabrera-Surez et al. 2011). The purpose of this thesis is to address this significant gap that exists in academic family firm literature through a cross-country consumer study, which is analysed through multivariate statistical methods.

For the first time an integrated framework identifies relevant origins of firm image and their role in affecting consumers' behavioural intentions. The wine industry is the chosen field of application since buyers largely rely on extrinsic cues, such as brand and firm reputation, during their purchase decision (cp. Ling and Lockshin 2003, Mueller, Osidacz, Francis and Lockshin 2010). Hence, findings of this research will be equally relevant for products and industry sectors characterised by intrinsic qualities that are difficult to assess (Le Breton-Miller and Miller 2015). Data is collected from a representative sample of wine drinkers in three countries, which are Australia, Italy and the United States of America to increase the scope of results. Robustness is added through the application of two state-of-the-art analytical frameworks: covariance-based structural equation models and discrete choice experiments analysed through different types of logistic models.

Chapter 2

Literature review

2.1 Organisational identity theory

An organisation's identity constitutes from a firm's most central, enduring and distinguishing core values and beliefs and provides an answer to the question "who are we as an organization?" (Albert and Whetten 1985).

Organisational identity is grounded in sociological and psychological conceptualisations of self. Identity theory derives an entity's identity from its self-perceived role and the associations related to this perception. The two key processes involved in the formation of a social identity are self-categorisation and self-comparison. In identity theory and social identity theory, an entity is reflexive of its self and is able to name, classify and categorise itself. This process is called self-categorisation and defines the identity of an entity. Further, through self-comparison an entity defines its relationship to other entities in the environment. The knowledge about this relationship is central for the concept of identity. This comparison process is thought to result in a selective accentuation of relevant dimensions that lead to self-enhancing outcomes (Stets and Burke 2000). It is further assumed that an entity's identity is a vastly temporally and spatially invariant construct that is coherent to an entity's attitudes, beliefs and actions (Whetten et al. 2014).

Organisational identity theory builds upon these conceptualisations through considering organisations as the individual entity. Hence, only characteristics of a business that are embedded in its core are potential distinguishing features that set a firm apart from its

competitors. Whetten (2006) points out that such core values and organisational identity are legitimate claims that have withstood the test of time. It is thought that the development of an organisational identity is a complex sociological process that involves shared beliefs of individuals in a company, however it is not clear whether the development of organisational identity derives from the aggregation of individual beliefs, institutional practices or the formation of a collective consciousness at a firm level. Brown et al. (2006) summarise that the vast majority of past research advocates a conceptual view at a collective level. It is argued that the collective perspective of organisational identity is preferred over the individual perspective, since the vast majority of firm members at individual level will account for few enduring and central characteristics of a firm[1]. Whetten (2006) argues that while many organisational behaviours can be explained using standard economic models, others are reflected in a firm's distinct identity. For this reason it is important to understand how specific internal firm-specific configurations influence behavioural outcomes in the marketplace. The following sections will elaborate on the particularities of organisational identity in family firms and its implications on perceived image.

2.1.1 Organisational identity of the family firm

Organisational identity theory is a key concept in family business research as it explains why family firms posses a distinct identity that differs from the one of their non-family counterparts. It provides a coherent theoretical framework to better understand the unique characteristics of family-owned and run businesses (Memili et al. 2010, Whetten et al. 2014, Zellweger et al. 2010, 2012). While Brown et al. (2006) argue that in many firms individual members' associations and beliefs only account for a small part of a firm's distinct identity, this situation is different in family firms (Zellweger et al. 2010). In this group of businesses a family maintains the ownership of the majority of firm assets and hence the controlling interest of a company. In such setting, key people in an organisation, i.e. family members, can exercise substantial influence over a firm's core values and beliefs and ensure its implementation in the long run.

The propensity of developing a distinctive organisational identity in family firms is largely owed to the overlap of the family and business subsystem (Sharma 2008). Family firms are

[1]The particular role of individual members in family firms will be covered in section 2.1.1

for this reason defined as *hybrid identity organisations* which arises from "the intentional amalgamation of two organizational forms or types which would normally be considered mutually exclusive" (Whetten et al. 2014, 480). Due to this fact, the identity of a family business is strongly intertwined with the identity of the family. More importantly, the firm draws its identity and reason for being from the family. This strong influence is also reflected in the role of the founder who is a key person in the family sphere and is strongly linked to the business.

The following factors characterise such hybrid identity and will be elaborated in the following: incompatibility, indispensability and inviolability. The incompatibility of the hybrid identity of family firms can be seen in the different ways in which families and businesses are basically organised. Family firms choose to incorporate identity elements that seem "incongruous or inconsistent" (Whetten et al. 2014, 487). Hence, these businesses are confronted with different and potentially conflicting expectations that arise from the distinct identities that constitute what it means to be a family and a business. Despite their potentially conflicting character, individual elements of the hybrid identity cannot be eliminated as they are central part of an entity's identity. An elimination of such elements would be destructive of this distinct identity. This characteristic is called indispensability of hybrid identity organisations. Finally, inviolability describes the overlap of an entity's identity with its actual behaviour. Only organisations that show consistency in reflecting their identity in their action exhibit integrity of their identity and maintain its distinctiveness. Despite hybrid organisations find themselves exposed to conflicting interests of stakeholders, all stakeholder interest must be fulfilled considering the above mentioned factors in order not to risk an organisation's legitimacy in the market.

Due to the hybrid identity of family businesses and conflicting interests of its stakeholders, family firm identity is often challenged. One example is the means-end inversion wherein family members may become overly focussed on accumulation of personal wealth. Similarly, agency theory implies adverse selection effects of staff are likely to be found in family firms due to the hybrid identity of family firms and the risk of nepotism in this type of businesses. These negative effects are rooted in the hybrid identity of family firms and the challenge of conflicting expectations among stakeholder groups. These effects are likely not only to affect the identity of a firm, but also its perception of stakeholders. For this reason, Whetten et al. (2014) calls for more research to investigate the broader question

how family involvement in a company affects the closely linked concepts of image[2] and legitimacy. Despite these challenges, it is in the foremost interest of any firm to develop a favourably perceived identity (image) in the marketplace. After this discussion it may seem contradictory why hybrid identity organisations still exist in the market despite their intrinsic challenges. One central point that counters this argument relates to the relationship of theses businesses to their external environment. Research finds that family firms show a higher concern about their reputation than their non family analogues (Dyer and Whetten 2006). Reputation of the business represents as a central concern and a closely linked aspect why hybrid identity organisations may enjoy a reputational advantage compared to single identity organisations. Whetten et al. (2014) argue that single identity organisations are mainly focused on utilitarian values (i.e. financial performance or shareholder value). The hybrid identity enables firms, such as family firms, to balance this orientation with a stronger orientation towards normative values (Bingham et al. 2011). The recognition of family firms for their fiduciary responsibility, i.e. towards long-lived assets, may generate a reputation advantage over their single identity analogues.

2.1.2 Differentiating brand identity and brand image

While there is a vast consensus about the definition of organisational identity, multiple definitions of organisational image exist. Due to conceptually different approaches in the past, it is necessary to define the brand image construct. The basic distinction of different concepts of image can be performed based on the assessing entity (Brown et al. 2006). One stream of research has defined brand image as the outcome of a self-reflective intra-organisational process. This conceptualisation defines image as the set of mental associations about an organisation that its members want others to hold or believe others hold[3]. However, specifically in the field of marketing a "significant amount

[2] Whetten et al. (2014) specifically calls for the concept of reputation, however the meaning of *reputation* in this context is interchangeable with the term *image*, which is more commonly used in marketing literature and used throughout this research. The conceptualisation of image relates to the *perceived* definition from a external stakeholder perspective. Foreman et al. (2012) elaborate in detail on the scholarly ambiguous use of these terms in past research.

[3] Researchers in the field of family firm research conceptualise the identity of a family firm to shape up as the sum of all characteristics of a firm that are influenced by the integration of the family and the business subsystems. This family firm identity forms the basis of the image of a family firm, which can be defined as the picture a family business intends to convey to its stakeholders. The actual perception of

of academic work has examined how stakeholders respond to focal organisations" (Brown et al. 2006, 104) when referring to the construct of brand image. Despite these substantial efforts to explore this construct in marketing science, conceptual family business work has frequently adopted an intra-organisational definition of image (i.e. Memili et al. 2010, Zellweger et al. 2010, 2012). Due to the lack of focus on stakeholder perceptions of organisational image[4], this research contributes to advancing the related knowledge in the field of family business research from a consumer-focused angle. Even when focusing on this customer-oriented conceptualisation of corporate associations, differential terminology exists. Organisational identity theorists advocate the terminology of *reputation* to describe corporate associations that external entities hold with an organisation (Astrachan Binz et al. 2018), while scholarly work from a marketing perspective more frequently conforms with the terminology of *image* (Brown et al. 2006, Esch 2008, Esch et al. 2006). Also Wielsma (2015) notes an interchangeable use of the above terminology, but does not take a further differentiation as above. In order to avoid ambiguity, this research adopts a marketing based definition of image as the default, particularly since key parts of the structural model and overarching framework emanate from the field of marketing research (cp. figure 2.1).

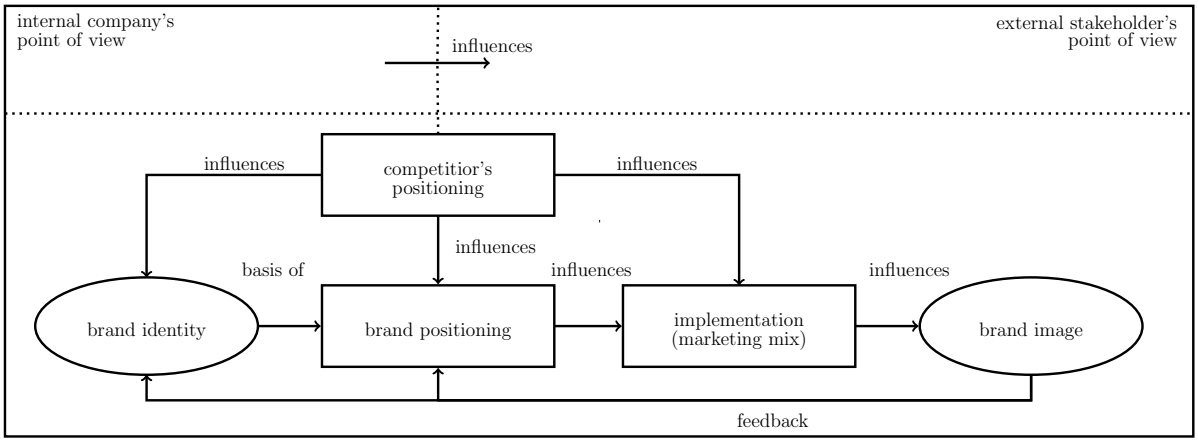
No doubt exists in academic literature about the fact that organisational identity is the conceptual origin of a firm's image: "Corporate identity provides the central platform upon which corporate communication policies are developed, corporate reputations are built and corporate images and stakeholder identifications/associations with corporations are formed" (Balmer 2008, 886). Firms transmit their identity through communication, behaviour and symbolism to stakeholders (Zellweger et al. 2012). The organisational image is constituted by stakeholder perceptions at any level (for instance the perception of products, strategies and employees of a business) and defines the organisational brand. As it can be seen in figure 2.1, a reciprocal relationship exists between brand identity and brand image. The transformation of brand identity into brand image involves two key processes. First, as a part of the positioning, a brand defines its absolute position based on its distinctive identity (self-categorisation) and its relative position among other entities (self-comparison)[5]. This includes the identification of a brand's unique proposi-

this projected picture and the actual family firm identity from a consumer point of view is called family firm reputation.

[4] In a vast body of family business literature this construct is called reputation, compare footnote 3.

[5] This reasoning is grounded in social identity theory (cp. section 2.1)

Figure 2.1: Relationship of brand identity, brand positioning and brand image (Esch 2008)



tion and reason for being. As brands compete amongst themselves, their positioning in the marketplace requires close consideration of the competitive environment. Second, the implementation a brand's positioning comprises the identification of the most appropriate marketing mix. This decision ultimately influences how consumers perceive a brand and how its image is built from an external stakeholder point of view. Brand image reciprocally feeds back into the identity of a brand and into its positioning. This aspect is important, since the development of a long-term brand strategy requires an understanding of key associations from a consumer point of view. As consumers associate attributes and benefits with brands, Esch (2008) underlines the importance of identifying relevant attributes that constitute core benefits that external stakeholders perceive essential to a brand[6]. The value of such stakeholder-oriented (i.e. consumer-oriented) perspective has been independently pointed out in earlier scholarly work: "Regardless of what a manager personally believes about a company, the corporate associations formed and held in the memory by an individual member or a stakeholder representative serve as the 'reality' of the organization for that individual" (Brown et al. 2006, 105).

[6] A detailed review of the individual associations that have been found to differentiate family firms from their non family counterparts follows in section 2.3.3.

2.2 A consumer perspective on family and wine

The distinct identity of family firms has been established in the previous section. When considering the wine category, the influence of symbolic values on brand image needs careful consideration, as this type of good is commonly associated with traditions and heritage (Maguire et al. 2013). In wine, it further holds true that value of the product itself is also attributed in large parts to symbolic values (Heine et al. 2016). Research hypothesises that authenticity is a major symbolic characteristic in building valuable wine brands (Heine et al. 2016). These previously described aspects are closely linked with the concept of family (Felden et al. 2016). For instance, family names are often part of brands and hence provide their reputability to a brand through this association. For this reason, it is evident that family-related attributes can affect the perception of product characteristics and can ultimately make the family brand capable of gaining consumer trust (Gallucci and D'Amato 2013). Significant gaps in the literature exist with respect to the question why family firm identity is an important characteristic to customers. The development of a theoretically founded framework is key to further this question and to ultimately help family firms shaping their identity and positioning in the marketplace (cp. figure 2.1). In order to achieve these objectives it is important to elaborate first on the sociological role of family and establish its link to the the evaluation of wine.

2.2.1 The sociological role of family and its link to consumer behaviour

Much brand research is based on the foundations about cognitive functionality of human memory. Key concepts about mechanistic relationships have been proposed by Anderson and Bower (1973) and are based upon a node-path relationship between different associations. Each association is represented by a node and its importance can be determined by the number of paths that are connected with each node. Krishnan (1996) argues that unique brand associations are a means to underline a brand's unique selling proposition within a brand category. Communication of family identity of a firm triggers associations in minds of stakeholders that are deeply rooted in human sociology. Human associative memory theory suggests that informational cues are processed in the context of such linked information in minds of receivers. Wide consensus in research exists that

the presence of "strongly held, favourably evaluated associations that are unique to the brand and imply superiority over other brands is critical to a brand's success" (Keller 1993, 6). Esch (2008) argues that strong brands evoke associations that are linked to intense emotions and images. Hence, these brand associations and their strengths are for this reason conceptually linked to customer-based brand equity (Krishnan 1996). French and Smith (2013) argue that not all associations with a brand are of equal importance. The word *family* itself and its related attributes may be closely related to influencing the decision process of consumers. This reasoning stems from the fact that the word *family* is linked to a multitude of meaningful experiences throughout human life and can be considered a concept of the highest relevance for humans (Beck and Kenning 2015). According to the theoretic foundations laid out by Fournier (1998), this mix of ordinary everyday experiences, which at the same time reflect meanings central to an individual's life, is the origin of powerful brand-consumer relationships. The link of a business to its family character is important to investigate since associative network theory suggests that strong brand associations are core to decision-making in consumers. Teichert and Schöntag (2010) exemplify the importance of developing a clearly differentiated and focused brand image for brands relative to their competitors. The authors further point out the role of family-related association to develop an emotionally differentiated brand image which stands apart from plain functional product characteristics, which in its core is similar to the argument developed by Esch (2008). More importantly, it is maintained that the transcendence of category-specific brand themes coined towards a "level of lived experience" (Fournier 1998, 367) and consumer-relevant purpose of a brand in a person's daily life are central elements of strong relationships between brands and their customers. It can be constituted that a strong brand imagery drives purchase decisions and is an important component of long-term marketing strategies (Esch 2008, Esch et al. 2006). The propensity of brands to influence consumer behaviour is dependent whether the goods that are related to the brand carry primarily hedonic or utilitarian values for their users (Chaudhuri 2002, Chaudhuri and Holbrook 2001). The focus of this study on wine as a product category represents a specific application to products with high hedonic value[7]. In their study Teichert and Schöntag (2010) conclude that embeddedness of a brand's imagery in a dense network of congruent attributes leads to an advantage in consumer

[7] A detailed discussion of the influence of hedonic value on the price formation of wine follows in section 2.2.2.

choice, as a higher density of favourable network associations in consumer minds leads to a quicker activation of brand-specific associations that provide an advantage in favour of one brand instead of another, particularly in impulse buying situations. Hence, the more associations consumers share with family firms the higher the relevance for products of this business type in their purchase decision.

2.2.2 The value of wine

2.2.2.1 Origins of the value concept

Differential economic theories of value have been proposed over the last centuries. Early theories expressed the value of goods and services through the amount of labour spent on their production. This definition of value signifies the existence of an objectively measurable value of products and goods. This so-called *objective classical theory of value* dates back to theoretic advances of Smith (1776), Ricardo (1817) and Marx (1867) in the 18th and 19th Centuries. One century later, Sraffa (1960) revived this classic theory of value. This approach to obtain an objective definition of value led to several difficulties. Key shortcomings existed in incomplete theoretic developments, the attribution of the role of capital, the translation of value into prices and the attribution of cost of negative externalities of production. Jevons (1871), Menger (1871) and Walras (1874) have markedly shaped a subsequent neoclassical perspective, which until today predominates economic research (King and McLure 2014): the *subjective neoclassical theory of value*. This economic theory manifests that the value of goods derives from an individual's subjective judgement and cannot be solely derived from market-based factors, such as labour spent on the production of goods and services. This conceptualisation assumes that value is a function of individual preferences that differ across economic agents. Key concepts explaining the origin of these differences are equilibria of demand and supply, as well as changing marginal utilities of consumption.

This research follows the above reasoning that value emanates from a product's importance for an *individual*. By this definition value is subjective and linked to the willingness of an individual to provide something in exchange to obtain possession of such product. Following this reciprocity, value can be considered a measure of benefit of an economic agent. In other words, the value products or brands possess for consumers originates from the benefits that consumers link to the same. The following three types of product

benefits can be pointed out (Keller 1993): functional benefits, experiential benefits and symbolic benefits. Functional benefits are the most basic and fundamental element out of the three and relate to basic physiological needs (Maslow 1943). In the case of wine, a the central functional benefit derives from the biological need to drink water to avoid dehydration. In fact, wine historically served this role back in ancient times when it has been impossible to obtain and preserve drinking water both on land and at sea. This benefit has become less important nowadays due to the wide availability of substitutes that serve this physiological need more economically with less side-effects. The second type of benefits, experiential benefits, are a central element that shape up the value of wine. The consumption of wine is linked to manifold sensory experiences, which can be of visible, auditory, gustatory, olfactory or somatosensory nature. All basic five senses are involved when consuming a bottle of wine. Such sensations trigger a cascade of cognitive processes, which itself create further experiential benefits. Symbolic benefits are the third type of product-related benefits and derive from product use or consumption rather than being an intrinsic characteristic of the same. Similar to the previous point, the nature of this third group of benefits is complex and mainly addresses higher needs of humans, such as self-actualisation and social approval (Maslow 1943). The following section focuses more closely on how the last two benefit categories act in the creation of value in wine.

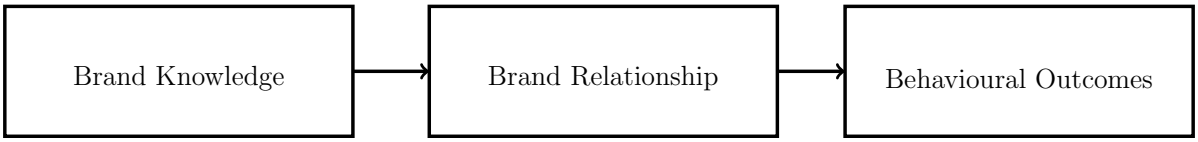
2.2.2.2 Creation and assessment of value in wine

Product appraisal is a central facet of contemporary research in economic sociology. The process of product valuation is a particularly complex process in markets that require the assessment of intrinsic qualities which cannot be entirely assessed before the purchase of a product. Wine serves as an example of such products which are particularly prone to the presence of asymmetric information. Beckert et al. (2017) argue that the economic valuation of products is not only related to objectively measurable intrinsic qualities, i.e. analytical parameters of a wine, or asymmetries in their informational distribution. Wine takes a special role as its appreciation may be considered an aesthetic process (Charters and Pettigrew 2005), similar to the appreciation of forms of art. Parallels in the process of appreciating wine and art are hypothesised to emanate from the sensual involvement in the process which comprises, apart from sensual stimuli, cognitive processes for its evaluation. Adding to this, in the case of wine, sufficient evidence exists that even experienced

experts fail to assign a monetary valuation to wines simply by their taste (Rössel and Beckert 2013). According to the earlier work of Bourdieu (1996), symbolic goods do not only derive their value from the material process of production, but also from symbolic capital. Beckert et al. (2017) point out that specific forms of capital exist in the field of wine and hint that symbolic criteria of wine evaluation have been gaining importance in the recent past. The authors attribute this growing relevance of symbolic cues to the emerging discourse about aesthetic characteristics of the product category in public. A bifurcation of the wine field is observed in this given environment: One pole is characterised by the presence of actors that promote the symbolic capital of wine, while absence of such actors is observed on the other pole. This bifurcation may serve as a means of differentiation for consumers, which can derive added value from symbolic capital of a product. Beverland (2005) argues that symbolic capital plays an important role in luxury wine brands that position themselves in the autonomous pole of the field by emphasising symbolic values, such as craftsmanship, tradition and individualism. However, Bourdieu (1996) argues that the appraisal of products depends on the individual characteristics of consumers. Products that emanate from a production process that can hardly be standardised, require an understanding of the related factors that are linked to the product and its history. This ability is linked to a person's endowment of different forms of capital, which is in turn linked an individual's social background. Beckert et al. (2017) show that the implementation of symbolic strategies has a strong influence on price premia realised among wine brands. In addition, the authors find that appreciation of symbolic attributes in particular is strongly related to income and education as a key socio-demographic determinants and wine-related socialisation[8] as category-specific attribute. Similarly, Heine et al. (2016) argue that "the wine category is a nucleus of luxury marketing, which is often overlooked". It is important to highlight that wine can be considered a luxury good even within common price ranges if preconditions, such as reliable quality standards, are fulfilled (Mundel et al. 2017). Following the sociological analytical framework of Bourdieu (1996), Beckert et al. conclude that the quality of a wine is determined in a "social process that takes place in a field of cultural production" (Beckert et al. 2017, 217). In addition to the previously exemplified strong symbolic cues that are linked to the wine category, high uncertainty about the intrinsic value of the product exists. With respect

[8]Wine-related socialisation was measured as the prevalence of wine consumption in a respondent's parental home.

Figure 2.2: Customer-based brand equity model (Esch et al. 2006)



to this high potential of uncertainty, brands exercise an important economic signalling function reducing the risk of asymmetric information and hence generate additional value that facilitates the decision-making process of consumers (Erdem et al. 2006).

2.3 Customer-based brand equity

Customer-based brand equity is defined as "the differential effect of brand knowledge on customer response to the marketing of the brand" (Keller 1993, 2). This concept is important as customer-based brand equity influences consumer behaviour. Esch et al. (2006) proposes a conceptual model of how brand knowledge affects behavioural outcomes. In this model, brand knowledge is referred to as the way in which consumers perceive and evaluate brands. Behavioural outcomes relate to *intended* consumer behaviour. Brand relationship constitutes the linking element between these conceptual nodes and establishes the way in which a brand bonds with its customers. Humans can form similar relationships with brands as they form with other people (Esch et al. 2006, Fournier 1998). These relationships are multifarious and anchored around the "perceived ego significance of the chosen brand" (Fournier 1998, 366). The embeddedness of such brand relationship within the customer-based brand equity model is visualised in figure 2.2. The following sections elaborate on the individual elements of this model.

2.3.1 Behavioural outcomes

Behavioural outcomes are the phenomenological expression of customer-based brand equity (Aaker 1996, Esch et al. 2006). Two meaningful behavioural outcomes that are linked to the concept of customer-based brand equity are loyalty and price premia (Aaker 1996). These both concepts are frequently operationalised under the umbrella of attitudinal and behavioural loyalty (Chaudhuri and Holbrook 2001). Loyalty is considered a central construct of customer-based brand equity and defined as the "biased behavioral response

expressed over time by some decision-making unit with respect to one or more alternative brands out of a set of such brands" (Jacoby and Chestnut 1978, 80). Loyalty towards a brand can evolve for several reasons. Most importantly, customers are thought to chose between a set of given alternatives based on their past experience and affect. However, loyalty towards a brand can also originate from other factors. One reason may be the physical presence of a given brand in the absence of substitutes. Hence, such loyalty originates from a distribution-based causality rather than from a relationship consumers maintain with a brand.

With respect to the conceptualisation of loyalty among marketing scholars, different perspectives exist in marketing. As there is no clear consensus among academics about the conceptual dimensionality of loyalty, it can be defined either uni-dimensionally, two-dimensionally or even through higher order constructs. However, a two-dimensional perspective has been widely accepted in research (Chaudhuri and Holbrook 2001, DeWitt et al. 2008, Ganesh et al. 2000, Jones and Taylor 2007, Kamran-Disfani et al. 2017, Taylor et al. 2004). The two dimensions are commonly represented through a behavioural and an attitudinal operationalisation of loyalty. The dual perspective, which is adopted by this research, is further specified in the following sections.

2.3.1.1 Behavioural loyalty

Behavioural loyalty is defined through repeated purchases of products belonging the same entity by a consumer. Two major different definitions of behavioural loyalty exist, which are discussed in the following. The first definition manifests behavioural loyalty as ex-post outcome of actual purchase behaviour (i.e. Ehrenberg 2000). The second stream of research defines behavioural loyalty as ex-ante intended behavioural actions (i.e. Johnson et al. 2006).

The first sub-stream of research in behavioural loyalty focuses on empirical generalisations in marketing that are grounded on the theory of double jeopardy (Ehrenberg 2000). Since there is no true definition of loyalty, researchers assume the observation of actual repeat purchase behaviour to be most appropriate to characterise behavioural loyalty. Results find that small brands are at a disadvantage, not only because they have less market share, but also because their buyers are slightly less loyal. The analysis of these relationships are performed using retrospective analysis of consumer behaviour. However, controversial

views of this conceptualisation of behavioural loyalty as observed repeat purchase exist. Several researchers (e.g. Day 1969, Dick and Basu 1994, Zeithaml et al. 1996) argue that customers may exhibit "spurious loyalty" (Zeithaml et al. 1996, 45), which means that despite dissatisfaction, consumers continue purchasing a brand, i.e. remain loyal, due to a lack of substitutes or prevalence of conditions that overrule intrinsic consumer preferences, such as extrinsic social pressure.

The second sub-stream of research in the field of behavioural loyalty expands the definition of behavioural loyalty beyond observed repeated purchase of a brand and is also called "true/intentional loyalty" (Bandyopadhyay and Martell 2007, 37). As this synonymous name suggests, this definition adopts the perspective of future behavioural intentions (Garbarino and Johnson 1999, Johnson et al. 2006, Zeithaml et al. 1996). Among related research, the approach of Zeithaml et al. (1996) was particularly innovative as it defined loyalty more holistically through behavioural intentions. Although these measurements of loyalty, such as purchase intention, may not result in exactly the same findings as when using measurements of observed behaviour, it can be established that "purchase intentions are predictive of future behavior" (Morwitz et al. 2007, 361)[9]. Similarly, Johnson et al. (2006) confirm the correlation of loyalty intentions and actual exhibited behaviour in their study. Further, Chaudhuri and Holbrook (2001) have provided further validation for this argument as they find behavioural loyalty[10], defined as behavioural intentions, to be correlated with the *actual* market share of a brand, and hence triangulate Ehrenberg's theory of double jeopardy.

2.3.1.2 Attitudinal loyalty

Dick and Basu (1994) have stressed the need to extend the definition of loyalty to attitudinal influences. The approach of Zeithaml et al. (1996) introduces attitudinal measurements to the loyalty construct[11] for the first time. Subsequent work, such as Chaudhuri

[9]The authors advise collecting purchase intentions in comparative mode rather than monadically, which is the case in the present study.

[10]Chaudhuri and Holbrook (2001) use the term purchase loyalty in favour of behavioural loyalty, however establish its synonymous meaning.

[11]Zeithaml et al. (1996) has defined loyalty through behavioural intentions. However, subsequent studies have entangled these items through classification into behavioural and attitudinal measures of loyalty.

and Holbrook (2001)[12], has adopted a more nuanced view of loyalty and has introduced a separate dimension of attitudinal loyalty by considering aspects of loyalty, such as willingness to pay a price premium[13], in an isolated way. This attitudinal dimension can be more effective in detecting consumer intentions since observed behaviour is constrained by several boundaries. Bandyopadhyay and Martell (2007) argue that the concept of attitudinal loyalty can help to overcome these boundaries, i.e. reducing the risk of measuring spurious loyalty, through decoupling distribution-related difficulties and purely brand-related effects through attitudinal measurements. Such aspects are of particular importance for small family business brands that face more difficulties in ensuring physical availability of their products, while a single research focus on behavioural loyalty "may be more appropriate for national or international brands than for regional or local brands" (Chaudhuri and Holbrook 2001, 84). Hence, a unidimensional conceptualisation of loyalty based on behaviour is not considered appropriate for small and medium firms, which account for the vast majority of family businesses. In addition, attitudinal loyalty is an important aspect with respect to the concept of customer-based brand equity, which is not only constituted by market share, but also by price premium. In this context, Chaudhuri and Holbrook (2001) find attitudinal measurements of loyalty to be correlated with the *actual* price premium brands achieve in the marketplace. Preliminary evidence in the food sector exists that family-claims in the food category are a means achieving a price premium in the marketplace (Darby et al. 2008, Hu et al. 2012, Mueller, Lockshin, Saltman and Blanford 2010).

All in all, the both dimensions of behavioural and attitudinal loyalty generate an understanding of the two key dimensions of customer-based brand equity, which represents the final cornerstone in the chain of effects of the customer-based brand equity model (cp. figure 2.2).

[12]The work of Chaudhuri and Holbrook (2001) has been key to this dual perspective and has inspired much research to adapt this dual conceptualisation in business to consumer (B2C) (Kamran-Disfani et al. 2017), business to business (B2B) (Taylor et al. 2004) product marketing, as well as in B2C (DeWitt et al. 2008) and B2B (Rauyruen and Miller 2007) service marketing research.

[13]Willingness to pay a price premium has been frequently referenced as measurement of attitudinal loyalty. It may be acknowledged that there is still no definite consensus about this concept. Other research streams also advocate the consideration of willingness to recommend (also called word of mouth) as a dimension of attitudinal loyalty instead of the willingness to pay a price premium (Rundle-Thiele 2005)

2.3.2 Brand relationship

2.3.2.1 Brand trust

In the marketing field trust is defined as the "willingness to rely on an exchange partner in whom one has confidence" (Moorman et al. 1993, 82). This definition is grounded on the anticipation of a partnering entity's future behaviour and the behavioural intention of the assessing entity itself. Erdem et al. (2006) argues that both aspects are required to define the construct of trust holistically. This conceptualisation has been adopted in a variety of influential literature in marketing, such as Chaudhuri and Holbrook (2001).
The theoretic grounding of the influential role of brand trust on loyalty emanates from foundations in relationship marketing. According to the theoretic development, trust creates lasting exchange relationships between two parties (Morgan and Hunt 1994). In the development of such relationships, brand trust is thought to play an intermediary role. Brand trust itself is influenced by the identity of a brand and the perception by its stakeholders (brand image, cp. section 2.1.2). For these reasons, trust has become a key concept in marketing, and more specifically in literature on branding, due to its high relevance in building close relationships with brands. These relationships are known to reduce uncertainty and risk for a subject (Morgan and Hunt 1994). Trust is an important antecedent of loyalty in situations of uncertainty and it may be assumed that the importance of trust is inevitably linked to situational contexts and the presence of asymmetric information. Blomqvist (1997) summarises from a social psychology perspective that imperfect or asymmetric information are a precondition of the existence of trust, since in conditions of perfect information only rational calculation exists. Brands can create a sense of trust through communicating specific elements of their identity and reduce consumer perceived risk as well as information costs (Erdem et al. 2006). The value of wine is determined by intrinsic characteristics that are hard to asses prior to purchase and in addition their valuation involves an aesthetic process (cp. section 2.2.2). Many consumers will only be able to assess the full intrinsic characteristics post-purchase. For this reason pre-purchase contexts carry a high informational asymmetry, which creates a risk for a decision-taking entity (Lockshin et al. 2006). This particularity in the choice of wine leads to assume that trust plays a significant role in the decision-making process. Trust gains even higher importance in environments where customers feel exposed to a greater level of vulnerability, such as in social contexts of high personal importance.

These contexts in which consumers attribute higher importance to the decision-making process than usual are called situations of high involvement (Delgado-Ballester and Luis Munuera-Alemn 2001). The choice of wine can bear such high inherent risk, particularly in social occasions (Campbell and Goodstein 2001, Johnson and Bruwer 2004). For this reason, it is inferred that trust takes a key role in purchasing wine. Evidence for this hypothesis has been recently provided by Bianchi et al. (2014) and is important to account for in the wine category. A positive effect of brand trust on both behavioural and attitudinal loyalty is well established in literature (Chaudhuri and Holbrook 2001, Delgado-Ballester and Luis Munuera-Alemn 2001, DeWitt et al. 2008, Esch et al. 2006, He et al. 2012) and has been found one of the most important antecedents of behavioural and attitudinal loyalty (Taylor et al. 2004). Especially in family businesses the effect of relational qualities is thought to be central part of their identity and a resource advantage that family businesses have over non family firms (Craig et al. 2008, Intihar and Pollack 2012, Sageder et al. 2018). Recent work in the field supports the view that family firm image increases the trustworthiness of firms. This effect is particularly visible when uncertainty towards product quality increases (Beck and Kenning 2015, Le Breton-Miller and Miller 2015). Following Erdem et al. (2006) favourable attitudes are hypothesised to evolve by less perceived risk which derives from a firm's reputation and image and reduces transaction cost for stakeholders (Li 2010, Sageder et al. 2014). A body of qualitative (Carrigan and Buckley 2008) and quantitative (Beck and Kenning 2015, Orth and Green 2009) research supports the view that trust is a central construct that consumers associate with family firms and hence provides the foundation to introduce this variable in the model.

2.3.2.2 Brand satisfaction

Brand satisfaction can be defined as "the result of a postconsumption or postusage evaluation, containing both cognitive and affective elements" (Homburg et al. 2005, 85). This evaluation is conceptualised as a function of past experiences with a brand and follows an additive relationship of the expectation level and a resulting disconfirmation (Oliver 1980). This relationship is called the expectancy-disconfirmation paradigm.
Brand satisfaction is considered one of the most important factors to measure a firm's past performance as well as to predict its future economic health, as it refers to a "firm's

most fundamental revenue-generating assets: its customers" (Fornell et al. 1996, 15). It is well-established that brand satisfaction is a central antecedent of future behaviour and attitude (Oliver 1980) and a key driver of long-term profitability and market value (Fornell et al. 2006, Gruca and Rego 2005). Research finds that consumers that are more satisfied with a firm have a significantly higher loyalty, higher willingness to pay and a lower intention to switch (Fornell et al. 1996, Zeithaml et al. 1996). Satisfaction of customers with a brand creates a goodwill for further transactions with a brand. Homburg et al. (2005) confirm earlier findings by Zeithaml et al. (1996) as they find a strong positive impact of customer satisfaction on willingness to pay. As willingness to pay and attitudinal loyalty are strongly intertwined (cp. section 2.3.1), it is assumed that customer satisfaction is strongly linked with attitudinal loyalty. Due to its importance for long-term outcomes of a firm, Fornell et al. (2006) conclude that the economic effects of satisfied customers are systematically undervalued by firms and should be a central part of a firm's strategic orientation. Earlier applications of brand satisfaction in a mechanistic context comparable to the one of this study can be seen in the previous work of Esch et al. (2006), where brand satisfaction was considered as an antecedent of customer loyalty and in Bianchi et al. (2014) who provide an application in the context of wine brands.

2.3.3 Brand knowledge

Customer brand knowledge constitutes from a customer's awareness of a brand and a customer's perceptions of the image of a brand. While brand awareness is a necessary precondition to knowledge, image is a multi-faceted construct that has been discussed a valuable intangible asset from a resource-based perspective as it can trigger customer actions and create a goodwill among stakeholders (Fombrun et al. 2000, Rindova et al. 2010, Wielsma 2015). The construct of brand image is defined as "perceptions about a brand as reflected by the brand associations held in consumer memory" (Keller 1993, 13). Berens et al. (2005) have identified associations with a corporate brand to be a salient choice cue when a corporate brand is dominantly visible in product communications. Past research has repeatedly pointed that family firms are "a special type of company with typical associations" (Sageder et al. 2018, 348). It can hence be inferred that the image of family businesses is distinctively different from the one of their non family counterparts. For these reasons this type of intangible asset is of particular relevance for family firms

(Sieger et al. 2011).

Organisational image is a complex, multi-faceted construct and requires a multi-dimensional way of measurement (Rindova et al. 2010, Wielsma 2015). Previous research in the field of family firm branding by Binz et al. (2013) has shown that this multi-dimensional nature of family firm image[14] calls for the development of dedicated measurement scales because existing scales may not overlap with the distinctive brand elements that separate family firms from their non-family counterparts. This potential issue has also been highlighted by Wielsma (2015) and is essential because existing scales of firm image have been developed based on studies among large and publicly listed companies and may not include the relevant brand attributes that differentiate family businesses from corporate businesses. From an industry viewpoint, other research in the field has even advocated the definition of sector-specific measurement scales of brand associations to take into account related sector heterogeneity (Low and Lamb Jr 2000). This study acknowledges these points by extracting brand associations with discriminant power from recent meta-studies in the field of family firm research. As this study also represents an application of family firm research to the (premium[15]) food sector, a review of recent research in the food space is presented together with the meta-studies about family firm branding to underline the strong parallels that exist between the key drivers of choice for premium food and the distinctive associations held with family firms. This section will discuss the most important associations that distinguish family firms from their non family analogues and show the significant parallels to the premium food category. Previous work by Anselmsson et al. (2014) and Sageder et al. (2018) represent central cornerstones in deriving these items. It is further shown that the elements discussed in this section seamlessly merge with the overarching framework of customer-based brand equity as these items have all been found to translate into brand trust and brand satisfaction, establishing the link to behavioural outcomes.

[14] Binz et al. (2013) specifically applied a scale of brand reputation, which conceptually is very close to a measurement of brand image (cp. section 2.1.2).

[15] It may be highlighted that the theoretic framework established in the following and its subsequent experimental validation represents an application to premium products. Such definition is adopted as it could be shown in section 2.2.2 that the value of wine derives from a complex sociological process, which may not by default apply to commodity products.

2.3.3.1 Uniqueness

Uniqueness is defined as the degree to which consumers perceive a brand different from its competitors. This construct is of high importance from a consumer point of view since only such distinctive brands can stand out in a competitive environment (Netemeyer et al. 2004). A distinctive position in the marketplace provides the propensity of developing a competitive advantage.

Customer-based brand equity comprises the construct of uniqueness at its core. By definition customer-based brand equity can only exist when a "consumer is familiar with a brand and holds some favourable, strong and unique associations in memory" (Keller 1993, 2). Uniqueness is also important from a resource-based perspective. Following the conceptual foundations of Barney (1991), unique resource configurations in a firm, also with respect to its reputation among customers, can generate a rare, imperfectly imitable resource that is difficult to substitute. Uniqueness also signals scarcity to consumers, which can satisfy their need for self-actualisation (Hwang et al. 2014). Anselmsson et al. (2014) show that uniqueness is a key component of brand image and an origin of brand equity. Consumers specifically search for brands that are distinct from their competitors aiming to "to restore a person's self-view as one who is different from others" (Tian et al. 2001, 52). Jun (2016) proposed uniqueness to be an antecedent of satisfaction in a destination branding context. However, results have shown ambiguity among different respondent groups. In addition, uniqueness is considered an important component of brand image, which has a direct effect on brand trust (Ke et al. 2016). In a closely related study, He et al. (2012) identify a significant positive relationship of brand identity[16] with brand satisfaction and brand trust. In addition, Chaudhuri and Holbrook (2001) argued earlier that brands with high levels of customer trust are associated with unique values. For these reasons a direct link between uniqueness of a brand and brand trust as well as brand satisfaction can be hypothesised. Chaudhuri (2002) tested the uniqueness satisfaction relationship and finds significant evidence for a link between the both constructs. In the luxury wine sector uniqueness is a dimension that is commonly leveraged as key influencing attribute of brand image (Beverland and Luxton 2005) and a potential source of sustained competitive advantage because of its propensity to drive a process

[16] He et al. (2012) consider the concept of brand identity a composite construct which derives from the dimensions brand uniqueness and brand prestige

of self-enhancement out of which consumers may derive satisfaction (Tian et al. 2001). A closer investigation of this construct appears of particular relevance since the strong identification of family members with the business and their close ties with stakeholders enable businesses to develop a "unique family firm image" (Sageder et al. 2018, 339). This uniqueness arises from the close relation of the family and the business system, which is a main source of social capital that is hard to imitate. Family firms often maintain strong relationships with external stakeholders, and their clients in particular (Arregle et al. 2007). The ties family firms establish with their customers are a source of mutual trust in a company, its products and the family name (Dyer 2006).

2.3.3.2 Social image

Brands can also take the role of sending social signals about their user to its social environment. Users of a brand derive utility from a brand's ability to enhance its users social self concept (Sweeney and Soutar 2001).
Enhancement of social self-concept is considered highly relevant for brands in categories that carry symbolic meaning (Tian et al. 2001). In addition, Kapferer (2012) argues that brands reduce the perceived risk for their buyers, which is also closely linked to social and psychological cues. Consequently, brands that provide a positive social image to their buyers reduce this risk for their purchasers. Empirical work in the food sector supports the view that social image influences consumer shopping behaviour (Anselmsson et al. 2014). Walsh et al. (2014) show in a non-food context that social image has a strong link with favourable cognitive and behavioural outcomes among consumers, such as trust, satisfaction and loyalty. The transfer of a brand image to its user is a well-studied effect and provides added value for consumers, such as social recognition. The authors argue further that social image refers to the social utility a brand delivers and hence comprises aspects, such as social status and prestige. Brands, which represent goods that are perceived as publicly recognised social symbols, can serve this purpose (Tian et al. 2001). Conceptually, prestige is a deeply rooted evolutionary concept which triggers a signalling effect in social settings (Saad and Gill 2000). Customers do not expect brands with a strong prestige to act untrustworthy, due to high risks of loosing brand reputation. This effect consequently establishes a positive link between a brand prestige and trust (He et al. 2012). In addition, the prestige of a brand may contribute to the exceeding a

consumer's expectations and can hence be hypothesised to positively influence consumer brand satisfaction. Similarly, Jin et al. (2016) have identified brand prestige an important antecedent of brand trust and brand satisfaction. Bresciani et al. (2015) suggests that family firms in the luxury sector are often perceived prestigious. Such prestige, which often is observed together with superior product quality, is reflected by a positive social image transfer to customers of the brand. Wine is a product that can be strongly linked with symbolic means (i.e. prestige), particularly in social contexts (Heine et al. 2016). For this reason, it is important to consider this construct and the hypothesised linkages in the present study.

2.3.3.3 Perceived quality

Perceived quality is defined as the way in which a customer views a brand's overall excellence, esteem or superiority (with its intended purposes) compared to the available alternatives (Netemeyer et al. 2004). The authors underline that this construct conceptually is at a high level of abstraction and rather considers a brand's overall performance rather than focusing on individual aspects. This idea of perceived quality is a central facet of key conceptual models of customer-based brand equity (Aaker 1996, Keller 1993). It is assumed that the perceived quality of a brand is closely linked to memory structures and associations that connect to a brand. In their means-end approach, Zeithaml (1988) argue that product information is retained in memory at several stages of abstraction. These information can derive through restatement or inference. As an abstract construct, perceived quality is the aggregate higher-level abstraction of both intrinsic and extrinsic lower level attributes. Due to the high level of abstraction, perceived quality can be seen as an expression of an overall value judgement of a customer. The consideration of such high-level aggregate measurement of perceived quality enables a better comparison across different groups (i.e. family and non family brands). More importantly, and in line with earlier research of Sweeney and Soutar (2001), perceived quality is an important component of consumer perceived value and more specifically is the central determinant of the authors' conceptualisation of functional value. As product quality constitutes an essential part of brand equity, trust is built though signalling characteristics of functional value and thus reducing the risk of choice from a consumer point of view. Aydin and Özer (2005) have found a strong relationship between perceived quality and trust in the service sector.

Subsequently, Anselmsson et al. (2017) confirm the presence of such strong relationship between perceived product quality and trust. In addition, earlier research, i.e. Anderson and Sullivan (1993) and Fornell et al. (1996), constituted that perceived quality positively influences consumer satisfaction. Further, Brady and Cronin (2001) have shown that the causal assumption of perceived quality as an antecedent of satisfaction holds across different cultures. Further, Foster and Cadogan (2000) have shown that perceived quality is an antecedent of trust, which fully mediates the effect of perceived quality on attitudinal loyalty. Adding to this, Walsh et al. (2014) have confirmed the joint effect of perceived quality on both trust and satisfaction. Product quality is an attribute which lies at the central core of the value proposition of family firms (Blodgett et al. 2011, Le Breton-Miller and Miller 2015). Carrigan and Buckley (2008) emphasise the deep knowledge that is sustained in a family business positively impacts the quality of products. In situations when there is a substantial uncertainty about the quality of products, the role of family firm image as a proxy of product quality becomes a meaningful cue for customers (Beck and Kenning 2015). Family firm status is conceptualised to affect the perceived quality of a brand through the spillover of secondary associations. This spillover originates from the overlap of the family and the business subsystem. Hence, it is conceptualised that family firms have a strong desire to not only protect their corporate reputation but also their family name by providing high-quality products to their customers (Blombäck 2011, Cooper et al. 2005, Gallucci et al. 2015). Hence, it can be assumed that the intertwining of the family and business systems strengthens the brand identity of a firm as implies quality and solicitude (Sundaramurthy and Kreiner 2008). This pursuit can also be perceived by consumers and positively affects their perception of product quality. First supportive evidence for this conceptualisation can be derived from Palma et al. (2016) and is also reflected in recent qualitative research in the wine sector (Heine et al. 2016). It may be added that particularly in the wine sector identity-driven brand management is found to be an effective means of communication. References to tradition, craft and the production of excellent products are important elements of such strategies (Beverland 2005). Family firms are naturally more likely to possess a competitive edge in this regard as knowledge is passed on over generations among family members in these firms (cp. Fonte 2008). This pursuit of family firms for excellence in product and service quality lays the foundation that makes these businesses "perceived as quality-oriented and trustworthy organizations" (Sageder et al. 2018, 358) among their stakeholders.

2.3.3.4 Localness

Localness of a brand is defined "as the degree to which a brand symbolizes the values, needs and aspirations of the members of the local country" (Özsomer 2012, 73).
Hence, localness of brands makes it easier for consumers to ensure accountability and conduct of businesses. For this reason, local brands can create superior relationships with their customers and hence effectively differentiate from global brands which helps these businesses to build a loyal customer base (Beverland and Luxton 2005). Specifically in the food and beverage sector - and in contrast to the non-food sector - a stronger affection towards local brands is observed. It is widely found that the perception of origin among food products markedly affects behavioural intentions of consumers. Locally produced food is highly valued by consumers and it is more likely to be purchased than products that are not produced locally (Gineikiene et al. 2016, Onozaka and Mcfadden 2011). A central part of this preference derives from a feeling of psychological ownership. This perception constitutes through a complex set of related indicators that are grounded in self-enhancement motives and identification of consumers with their natural environment. Gineikiene et al. (2017) point out that local production and linked cultural socialisation based on this localness are important aspects that influence consumer behaviour. Localness can hence be seen the antipode of globalisation, which often is criticised for having given rise to "companies that do not have factories and, as a result, wash their hands of anything that goes on in the archaic factories of their Asian subcontractors" (Kapferer 2005, 320). For these reasons, localness of a brand can be considered a point of differentiation that enables firms to compete with global brands. Özsomer (2012) as well as Schuh (2007) emphasise the strong cultural grounding of brands in the food and beverage category in local traditions. The perceived localness of brands increases consumer trust in its products (Schuiling and Kapferer 2004). Especially in the food sector, increased trust of consumers towards locally produced food is commonly found (Feldmann and Hamm 2015). This effect is reinforced by and linked to a higher perception of traceability and sustainability (Paloviita 2010). Further, it is found that locally produced food provides a higher satisfaction to consumers and leads to an increased probability to purchase such goods (Bratanova et al. 2015, Megicks et al. 2012). Family firms are considered to be strongly integrated in the local environment, which conveys a highly authentic experience for consumers and is considered to contribute to the preservation of local traditions and

products (Presas et al. 2014). Especially the wine sector is strongly linked to heritage and embedded in the local territory (Beverland 2006). More importantly the concept of *terroir* is a strong reference to the local character of businesses and an integral part of the value of a wine (Heine et al. 2016). Also Carrigan and Buckley (2008) as well as a meta-analysis by Sageder et al. (2018) emphasise that consumers associate local production and sourcing of production factors to be an important characteristic of family businesses[17]. Hence, the fact of being a family business influences the effect of local production on trust as it facilitates the development of producer and supplier relationships.

2.3.3.5 Corporate social responsibility (CSR)

Corporate social responsibility is defined as "context-specific organizational actions and policies that take into account stakeholders' expectations and the triple bottom line of economic, social, and environmental performance" (Aguinis 2011, 855).
Early studies about research in corporate branding, such as Fombrun et al. (2000), have pointed out the importance of early constructs of corporate social responsibility. Information about corporate social responsibility of a firm has the propensity to influence relationships between a firm and its customers (Aguinis and Glavas 2012). Behavioural outcomes, such as purchase intentions (Berens et al. 2005, Mohr and Webb 2005) and loyalty (Maignan et al. 1999) of customers are ultimately influenced by CSR. Similarly, Anselmsson et al. (2014) find corporate social responsibility to be ultimately influencing consumer loyalty and price premium intention in the food sector. Other researchers investigate the mediation of corporate social responsibility through factors, such as trust and satisfaction. Corporate social responsibility is found to affect consumer satisfaction (He and Li 2011, Luo and Bhattacharya 2006) as well as trust in a brand (Lev et al. 2010, Swaen and Chumpitaz 2008, Vlachos et al. 2009). Corporate social responsibility is considered among the most important associations linked to family firms (Sageder et al. 2018). In this regard Binz et al. (2013) find that perceived relational qualities[18] with their stakeholders increase consumer preference of these firms. More earlier research, such as Bingham et al. (2011) and Blodgett et al. (2011), emphasises the central role of ethical values in family firms, among them social responsibility, ethic conduct and global-

[17] Compare also Kapferer's (2005) note on the household appliance manufacturer Moulinex in the context of local embeddedness of family firms.
[18] This composite measure comprises the three key dimensions of CSR defined by Aguinis (2011).

ism. A further managerial study on family businesses confirms this aspect and underlines the strong commitment of family firms towards employees and local communities (Price Waterhouse Coopers 2016). A case study confirms the above mentioned results in the alcoholic beverage sector by pointing out the efforts family firms take to demonstrate good corporate citizenship to internal and external stakeholders (Byrom and Lehman 2009).

2.3.3.6 Long-term orientation

Long-term orientation is defined as the "tendency to prioritize the long-range implications and impact of decisions and actions that come to fruition after an extended time period" (Lumpkin et al. 2010, 241) and is further considered "a type of dominant logic that influences the dominant coalition's decision process" (Lumpkin and Brigham 2011, 1155). In family firms this dominant coalition is represented by the family whose decision-making process is influenced by strong intergenerational linkages in the family.
Research finds long-term orientation of a business to be an antecedent of trust for the counterparty (Chung et al. 2008, Lohtia et al. 2009, Meier et al. 2016, Parkhe 1993, Pesämaa and Hair 2007). Benefits of a long-term orientation of a firm are hypothesised to be grounded in its stabilising effect on identity of a firm. From an agency theory viewpoint, in a short time horizon agents will only maximise their own utility, rather than sacrificing their short-term benefits for an ongoing relationship. However, in a long-term relationship this opportunistic behaviour is not expected to be present due to its anticipated consequences on the future of the relationship. For this reason, the intention of a business to align its behaviour towards long-term goals acts as a signal of trustworthiness. Consequently, long-term orientation reduces the risk of uncertainty for stakeholders and is often considered a reason why family firms are seen more trustworthy than their non-family counterparts (Zellweger et al. 2012). A high level of long-term orientation further implies that conflicts in a business relationship are effectively minimized and resolved, which is a source of mutual satisfaction for the parties engaging in such relationship (Griffith et al. 2006). Long-term orientation is a characteristic commonly attributed to family firms (de Vries 1994, Krappe et al. 2011, Le Breton-Miller and Miller 2015) and represents a concept that is broadly applicable across industries. The unique pooling of ownership and control results in a high fiduciary responsibility of family businesses towards long-lived assets, which manifests in an inter-generational viewpoint of these firms when

taking decisions. This idiosyncratic behaviour is owed to the absence of agency cost among this type of companies (Sundaramurthy and Kreiner 2008). Further, long tenures of family members (cp. Flören 1998) in the company imply stability. For these reasons, long-term orientation is commonly considered a key source of competitive advantage in family firms (James 1999) and has been found to positively affect family firm performance through positive effects on family firm image (Zellweger et al. 2012). The propensity of family firms to develop lasting relationships with customers creates mutual relationships of trust (Binz et al. 2013, Le Breton-Miller and Miller 2015). Carrigan and Buckley (2008) have found qualitative evidence that long-term orientation of family firms is adding value for stakeholders and facilitates the development of trust towards family firms. In the wine sector long-term orientation has an even higher relevance due to the high variability of environmental conditions across the years. Further, it holds true in many family businesses in the wine sector that final products will carry the family's name. Hence the family name has a dual role as it not only represents the organisational brand but also carries a high reputational value for the family. This reality incentivises family business leaders to sacrifice profits in challenging years and invest more resources than usual if required to protect not only the organisational but also the personal family reputation. Heine et al. (2016) specifically state in this regard that "in contrast to many margin-driven corporate groups, many family-owned vineyards in particular just have a genuine intent and follow a long-term-oriented and sustainable business philosophy" (182). For the reasons presented above it is thought that long-term orientation of a family business serves the protection of long-lived assets, such as family name, legacy and reputation (Bresciani et al. 2015, Habbershon and Williams 1999), and is directly linked to consumer trust and satisfaction.

2.3.3.7 Customer orientation

The concept of customer orientation, originally introduced by Saxe and Weitz (1982), is defined as an organisation-wide marketing concept of customer-oriented selling and helps customers in taking purchase decisions that are coined towards solving problems at a customer level and that are meeting the needs of the marketplace.
Customer-oriented businesses have an underlying understanding that the ultimate reason for a firm's being in the marketplace is to serve customer interest. Deshpande et al. (1993) argue that customer orientation may be perceived differently from a customer and

business point of view. For either perspective research finds that the perceived customer orientation from a customer point of view significantly correlates with business performance and is an important element of a firm's reputation (Walsh and Beatty 2007). A rich body of literature also confirms positive effects of customer orientation on consumer satisfaction and consumer trust (Brady and Cronin 2001, Goff et al. 1997, Hennig-Thurau 2004, Swanson et al. 1998, Walsh and Beatty 2007, Williams 1998). These findings have been conceptualised theoretically many years before and live in the very definition of the concept of customer orientation: "The marketing concept requires an organization to determine the needs of a target market and adapt itself to satisfying those needs better than its competitors. The organization seeks to generate customer satisfaction as the key to satisfying its goals" (Saxe and Weitz 1982, 343). Consumer associations with family businesses show a strong link with relational qualities rather than exclusively with business qualities (Binz et al. 2013, Craig et al. 2008). Hence, customer orientation is a central quality of family firms, focalised in a culture rooted in interpersonal relationships (Poza et al. 2004, Tokarczyk et al. 2007). A clear focus towards customer orientation in family firms is a central antecedent to develop superior customer relationships. Craig et al. (2008) have identified that such customer orientation is a means of differentiation in the marketplace that leads to superior performance of a firm. It is shown that especially businesses in the agricultural and food sector can benefit from developing a strong customer orientation to avoid commodity- and sales-oriented modes of competition (Tokarczyk et al. 2007). Evidence exists that family firms significantly differ in implementing customer relationship strategies (Cooper et al. 2005), which enables these firms to leverage customer orientation as a marketing tool to differentiate from direct competitors (Sundaramurthy and Kreiner 2008). Especially small family firms are thought to develop close personal ties with their customers, which facilitates the development of trust-based relationships (Intihar and Pollack 2012). In summary, these findings lead to assume that consumers perceive customer orientation among family firms differently than among non-family firms.

2.3.4 Extrinsic drivers of wine choice

Consumers rely on different cues when choosing and evaluating products (Zeithaml 1988). In the wine category extrinsic information that is displayed on a bottle of wine provides valuable information in the process of choosing a product (Neuninger et al. 2017). Experi-

ments in the wine category have shown that extrinsic attributes correlate with the quality perception and influence relative choice as well as willingness to pay (Sáenz-Navajas et al. 2013). The work of Lockshin et al. (2006) has been a key study to introduce discrete choice experiments to marketing research in the wine sector. In their seminal paper Lockshin et al. have modelled consumer choice based on extrinsic attributes, such as awards, origin, brand and price of wine. Subsequent studies have both employed discrete choice experiments, as well as best-worst scaling. Past research has investigated simulated experiments of wine choice in on-trade (i.e. Corsi et al. 2012) and off-trade (i.e. Mueller, Lockshin, Saltman and Blanford 2010) settings. In addition to different consumption settings, Hall and Lockshin (2000) have identified wine choice to differ between occasions. Subsequent research has investigated the drivers of wine choice for informal (i.e. Corsi et al. 2012, Mueller, Osidacz, Francis and Lockshin 2010) and formal (i.e. Mueller, Lockshin, Saltman and Blanford 2010) consumption occasions.
While in all these studies price has been the attribute of foremost importance, other attributes have shown vast heterogeneity. To obtain unbiased and reliable results it is important to always include the most relevant variables when conducting discrete choice experiments (Gao and Schroeder 2009, Islam et al. 2007). The following sections discuss relevant variables with respect to their prior application in the field.

2.3.4.1 Price

In market economies, prices play a central role of allocating demand and supply. In the usual scenario, the group of businesses offers their goods on the supply side, while the aggregated preferences of consumers form the demand side in the marketplace. The price-utility function between suppliers and customers is inverted. While for suppliers marginal utility is positively related to sales prices, marginal utility of consumers decreases with increasing purchase prices. Following this reasoning, price is a key influencing variable of consumer choice. The vast amount of choice experiments that have been carried out in wine marketing research confirmed price to be among the most important drivers of consumer choice (Corsi et al. 2012, Costanigro et al. 2014, Mueller, Lockshin, Saltman and Blanford 2010, Williamson et al. 2016). Price is also an important attribute when estimating the monetary value of other attribute levels and for this reason is an essential element for the economic interpretation of individual attribute levels.

2.3.4.2 Origin

Earlier choice-based conjoint studies in the field of marketing have identified the country of product origin to be an important driver of consumer choice (Kotler and Gertner 2002, Okechuku 1994). Similar findings emanate from dedicated research of in the field of wine. Since the origin of wine is an important attribute driving consumer choice (Casini et al. 2009, Goodman 2009), multiple facets of scientific research on origin exist. One research stream has considered origin at a regional level (Corsi et al. 2012, Mueller Loose and Remaud 2013, Perrouty et al. 2006). The vast majority of this type of studies have been conducted in a single country. Another stream of research has investigated origin at a country level (Bowe et al. 2016, Lockshin et al. 2017, Williamson et al. 2016). Although both streams of research shape the majority, also mixed assessments exist where individual regions of different wine growing countries are compared among each other (Cicia et al. 2013, Moulard et al. 2015).

Regions of origin are one example of geographic indications. Brodie et al. (2016) argue that such indications are part of the broader country of origin framework. Exported products are often the earliest and most constant touchpoints consumers have with another country. For this reason, consumers develop stereotypes about these countries whose products they have been exposed to (Maheswaran 1994). Exposure to these products will in turn be an important component of a consumer's country image. Origin-related effects are meaningful drivers of consumer choice. Consequently, origin is introduced in the choice experiment due to this high relevance on consumer choice of wine. Country of origin is preferred in this research due to the more general conceptual scope in the context of the present study.

2.3.4.3 Recommendations

Recommendations are powerful means that influence the choice of wine. Parsons and Thompson (2009) propose a typology to classify different types of recommendations. In their research the authors identify awards to be the most influential class of recommendations. However, the authors do not test the effect of word of mouth since it does exceed the scope of the study. Nevertheless, earlier research by Goodman (2009) suggests that it is most likely to be even more influential than awards. Due to this relevance in the wine category, both classes of recommendations are discussed in the following.

Word of mouth The key characteristic of word of mouth is its origin within a person's social circle, i.e. friends, colleagues or acquaintances. This class of recommendations is considered to be independent of the brand and the retailer and draws its credibility from perceived expertise and historic experience at earlier points in time (Parsons and Thompson 2009).

Word of mouth is an important means of influencing consumer decisions (Chevalier and Mayzlin 2006). East et al. (2008) identify positive word of mouth to be an important influencing factor of brand purchase probability. Specific research in the wine category supports these findings. Goodman (2009) shows that this class of recommendations are an influential driver of consumer choice across many wine markets. This finding is consistent with earlier research in the field (Chaney 2000, Keown and Casey 1995). Recommendations can either emanate from professional dedicated staff, such as sommeliers (Dewald 2008) or be delivered through peers, such as fellow consumers (Camillo 2012). Bansal and Voyer (2000) find that the effect of recommendations are positively affected by the strength of ties. In this context it can be advocated that recommendations by friends are considered to be particularly influential compared to recommendations by strangers. Positive effects of word of mouth are likely to emanate from an increase in perceived quality and value of a product (Aqueveque 2015), which positively affects product utility for a consumer. This higher utility in turn is positively associated with the probability of product choice. Although evidence about its importance as a choice cue of wine exists (Chaney 2000, Goodman 2009, Keown and Casey 1995), to the best knowledge of the author no research has tested this cue in a discrete choice framework in the wine sector.

Awards Another key class of recommendations are represented by awards. Unlike the previous class, the source of information constitutes from anonymous experts and organisations that are autonomous from the influence of the referee. Although such experts may not hold strong ties with individual brands, they still maintain affiliation with the industry as a whole as it represents the foundation of their business activity. Through this affiliation with the industry, this class of recommendations gains additional credibility (Parsons and Thompson 2009).

The important role of wine awards and expert ratings as quality indicators has been investigated by Corsi et al. (2012), Costanigro et al. (2014), Gustafson et al. (2016), Lockshin et al. (2006), Williamson et al. (2016). However, not all wine awards influence the choice

of wine in the same way. While some wine awards exercise a positive effect on consumer choice, others negatively affect consumer perceptions (Neuninger et al. 2017). This observation holds particularly true for medals at the lower end of the evaluation range, such as bronze awards (Lockshin et al. 2006, Neuninger et al. 2017, Orth and Krška 2001). Despite these mixed findings research advocates the view that gold medals as well as victories in wine shows increase the probability for a wine of being chosen by consumers and achieving a price premium compared to wines without award (Gustafson et al. 2016, Lockshin et al. 2006). In particular Neuninger et al. (2017) have recently confirmed results of an earlier study by Lockshin et al. (2006) who found gold medals to exercise a consistently positive effect across consumer involvement groups.

2.3.4.4 Firm type

Findings of earlier research lead the assumtion that information about intrinsic business and brand characteristics influence consumer choice. Family firm status is one cue carrying multifarious information (cp. sections 2.3.1-2.3.3). The fact that family firm image is a valuable asset is exemplified by its role in the luxury goods sector where the history of brands is often linked to a family tradition (Beverland 2005, Bresciani et al. 2015, Heine et al. 2016). In this context, family involvement acts as a warrant of superior product quality and consistency of values in these companies. Also in the food sector, preliminary evidence exists that family identity can be a source of achieving a price premium for agricultural produce in the marketplace (Darby et al. 2008, Hu et al. 2012)[19]. In the specific context of the wine sector, Sáenz-Navajas et al. (2013) find that firm type, indicated through the bottling by an independent winemaker, négociant or a cooperative, has a clear influence on the perceived product quality. A further study by Mueller, Lockshin, Saltman and Blanford (2010) is methodologically and topically very close to the context of this research and finds that wine label references to firm history (created though related associations of long-run family tradition) show a significant positive effect on consumer preference. The authors find this attribute to be one of the most meaningful ones ranking third by importance after price of a bottle and stated ingredients on the back label of a wine. The latter two attributes have been identified to have a nega-

[19]The cited studies however take assumptions about firm size when testing the family firm claims, and hence run the risk of confounding effects of size and firm type (compare footnote 21 in chapter 7 for further discussion).

tive marginal utility, while the attribute involving family shows positive marginal utility. Danner et al. (2017) provide further supporting evidence for this finding by pointing out that in informed tastings elaborate description of information about wines positively affect consumer perceptions. Nevertheless, findings of earlier research by Palma et al. (2016) are not unambiguous with respect to the difference among a set of firm type imagery stimuli in a wine choice context. As the study by Mueller, Lockshin, Saltman and Blanford (2010) is strongly focused on back label information, other attributes, such as recommendations, that have been found to be of foremost relevance have not been part of the study. For this reason, there is not only a gap with respect to the investigation of a purified measure of company type, but also with respect to a comparison of different effect sizes between these influencing factors.

Chapter 3

Research questions

This research follows several recent calls for further investigation of family firm stakeholder perceptions and its effects on related behavioural consequences in a cross cultural context (Lude and Prügl 2018). Specific knowledge gaps exist with respect to the consumer stakeholder sphere, which can be seen from the fact that only few studies have been published in the recent past (Sageder et al. 2018). The research questions investigated in this work follow an incremental agenda of subsequent investigations.
In the first place, little knowledge exists about the effects of family firm status on the product choice process of consumers. A meta-analysis of Wielsma (2015) presents theoretic evidence that favourable reputation of these firms positively affects sales. However, Lude and Prügl (2018) argue that observations may show dependence on the cultural setting. To define a starting point, the first research question investigates whether a principal effect of family firm status on consumer choice exists.

RQ_1: *Does family firm status affect product sales?*

This first research question represents a macroscopic perspective on the question of behavioural consequences of family firm status from a consumer perspective and constitutes a legitimisation of any subsequent research on this topic. If there is a significant behavioural outcome associated with research question 1, further questions arise about the precise mechanisms of action. A central question aimed to be investigated relates to the ability of communicated family firm status to influence the perception of other informational cues and hence affect consumer behaviour. This research question follows explicit

call by Beck (2016).

RQ$_2$: *How is the informational cue family firm status linked to other brand cues, how are behavioural intentions of consumers affected and what interdependencies exist between the variables?*

This study can draw from established theoretic frameworks in marketing research to provide answers to research question 2, which opens the opportunity for further validation of results in other contexts and industry sectors.
In addition, the consideration of demographic characteristics of consumers will provide further insight how communicated family firm status alters the perception of individual informational cues. Beck (2016) explicitly comments that stakeholder heterogeneity with respect to key demographic variables "remains widely disregarded" (241). Hence, a further research question derives:

RQ$_3$: *How are choice preferences influenced by consumer heterogeneity? Are there effects of consumer demographics, involvement or country on the price premia associated with family firm product provenance?*

Research question 3 deepens the findings of the preceding questions and aims to add robustness to the analysis by identifying common pattern and group-wise differences in the sample.
Further, Blombäck (2010) argues that there is little knowledge whether associations and relevance of family branding is influenced by the cultural context. In order to investigate cultural effects all research questions are assessed through replication in three countries. This replication across countries addresses the potential dependency of findings to a specific cultural context (Lude and Prügl 2018).

Chapter 4

Method and sample

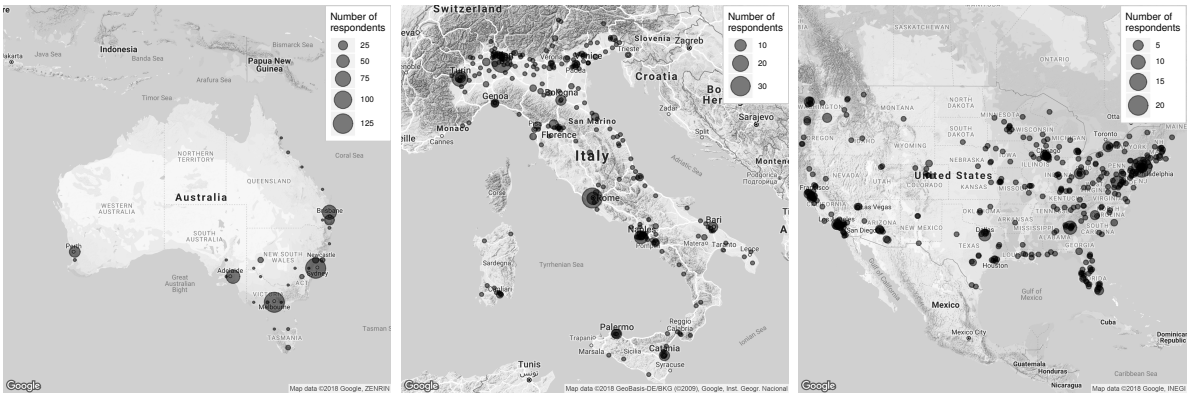
4.1 Sample characteristics

The data for this study has been collected in Australia, Italy and the United States of America in October 2017. Respondents have been recruited through `Toluna`, a professional panel provider in the three countries and had to fulfil several criteria to qualify for participation in this study. In order to address actual category users, participants had to drink wine at least once per month[1] and were required to have bought wine from family and corporate wineries within the past year. The latter condition is important to achieve a relevant sample of respondents that have actually been involved with a choice situation in the recent past. By this selection, results of the choice experiment further are more natural due to a respondent's experience with each firm type. Representativeness of the data is maintained by quota sampling. The quotas derive from recent calibration studies for regular wine drinkers and provide information with respect to gender, age and geographic origin of respondents. Panelists have been surveyed through an electronic questionnaire which has been implemented in `Qualtics`, an online survey platform. The platform has been set up to automatically keep track of preset quotas obtained from calibration studies and has been programmed to monitor the validity of responses. Validity of responses has been checked through two logic control questions in the questionnaire. If at least one reply was incorrect, respondents have been excluded from the sample. After eliminating incomplete and invalid responses, 513 Australian, 518 Italian and 510 US respondents

[1] A person who drinks wine at least once a month is defined as *regular wine drinker*.

Figure 4.1: Geographic distribution of respondents

(a) Australia (b) Italy (c) United States



remained in the dataset. The composition of the sample with respect to all quota variables is shown in appendix A.1, an overview of the geographic dispersion is displayed in figure 4.1. Further, educational (figure A.1) and occupational (figure A.2) data has been collected for each respondent. The individual figures show that the sample spans across all education and employment groups. As far as the individual educational groups can be compared among the countries, the data shows consistency and does not skew towards different groups across countries. The data of occupational status can be compared more easily as the question items could be kept consistent across all countries. The sample distribution does not show unexpected deviations for this question either. Nonetheless, no calibration data has been available for employment or occupational status that could serve as a reference to compare the composition of the sample against.

4.2 Demographic data

The first part of the questionnaire operationalises the quota sampling by introducing three dedicated questions about wine consumption frequency, gender, age, geographic origin of each respondent as well as two questions to ensure that respondents have purchased wine from family *and* corporate wineries in the past 12 months. The block about wine purchase in the past 12 months gathers further information such as brand and price recall, as well as purchase occasion, purchase channel and information sources. This first part contains the essential demographic elements to enable an initial screening of the respondents.

A second part with additional demographic questions has been introduced at another location of the survey in between the block of the structural equation model (section 4.4) and the block of the discrete choice experiment (section 4.3). Since no screening is performed based on these questions, this second part is placed at a different position to better separate questionnaire blocks of sections 4.4 and 4.3. The following data is obtained in this intermediary section of the survey: wine interest (Lockshin et al. 1997), subjective wine knowledge (Dodd et al. 2005), education, employment status, household size[2] and income[3].

4.3 Discrete choice experiment

The discrete choice experiment serves as a robust method to investigate research questions 1 and 3. The experiment delivers a first exploration whether family firm status affects consumer choice.

High reliability of the hypothesised choice scenario has been ensured through including the most relevant attributes in the choice experiment. A literature review in section 2.3.4 points out the most important drivers of consumer choice of wine, which are price, origin and recommendations. In addition to these known key choice drivers, firm type is introduced as a dichotomous variable. Table 4.1 exhibits the attributes and their individual levels which have been introduced in the study. The experimental design is grounded on several considerations. The literature in section 2.3.2.1 shows that a high inherent risk in the choice of wine exists particularly in formal social occasions. Mueller, Lockshin, Saltman and Blanford (2010) point out that in formal occasions consumers are very likely to use risk reducing strategies to take more informed decisions than in informal or casual consumption occasions. For this reason, the choice task has been framed as *formal occasion with friends at home* for which respondents had to choose one 750ml bottle of wine out of two given alternatives. Respondents also had to state whether they would realistically buy the chosen alternative for the given occasion. Figure 4.2 shows an example of one choice situation as it was presented to respondents when taking the survey.

[2] A household is defined according to SNA 2008 §4.4, 4.149 and 24.12 (European Commission 2009)

[3] Eleven income groups have been derived based on the latest Australian (Australian Bureau of Statistics 2016), Italian (Banca Italia 2014) and US (US Census Bureau 2015) census reports.

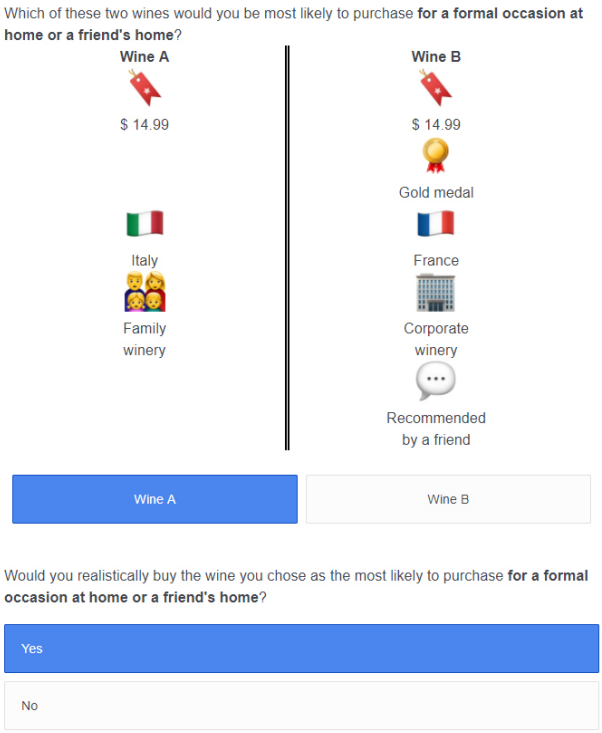
Table 4.1: Choice-based conjoint experiment: attributes and levels

	Levels			Level
Attribute	Australia	Italy	US	id
Price (bottle 750 ml)	$14.99	€4.49	$11.99	1
	$19.99	€5.99	$15.49	2
	$29.99	€8.99	$23.49	3
	$34.99	€10.49	$27.49	4
Recommended by a friend	Yes			1
	No indication			0
Medal / Award	Gold medal			1
	No indication			0
Origin	France			1
	Italy			2
	Australia			3
	USA			4
Ownership	Family winery			1
	Corporate winery			0

Table 4.2: Choice-based conjoint experiment: efficiency measures

D error	0.345
A error	0.697
B estimate	83.646
S estimate	331.179

Figure 4.2: Choice-based conjoint experiment: sample choice set



The operationalisation of the individual price levels is grounded on recent industry reports of the national Australian, Italian and US wine market by Euromonitor International (2017*a*,*b*,*c*). In order to obtain a realistic median retail price for special occasions, double the nominal average off-trade price was derived from these market reports as median price for the given choice scenarios. The actual four price points for the choice sets have been defined as 60%, 80%, 120% and 140% of this median price in each country. This method leads to comparable price points of published research, such as Mueller, Lockshin, Saltman and Blanford (2010), and ensures a consistent methodology across all three countries. Since a baseline is required to compare country effects in logistic regression models, a further country has been introduced in the experimental design. France has been chosen the baseline country, since it represents the most important wine importing country the three countries under investigation share in common. A blocked D-efficient experimental design consisting of 2 blocks with 10 choice sets each has been implemented to reduce the required number of choice tasks. The design has been optimised for estimating all

main effects and an interaction effect for family and price variables using the software package `Ngene` by `ChoiceMetrics Pty Ltd`. Table 4.2 exhibits the estimated efficiency measures of the research design and gives an important hint towards the conduct of the research. The *S estimate* indicates that a sample of at least 332 respondents is required to detect differences in the model at a 5 percent significance level. The planned sample of 500 respondents per country exceeds the minimum requirements of the model. The full experimental design showing the individual choice sets can be found in table A.4.

4.4 Structural equation model

The structural equation model takes the central role in the study to provide statistical evidence to answer research question 2 through hypothesis testing. Hypotheses derive from previous research in the field and related disciplines. The following sections summarise the consensus of the literature review for each of the individual variables of behavioural outcomes, brand relationship and brand knowledge. Further, the operationalisation of variable-specific measurements is derived from previous studies. Different possibilities exist in order to visually express the relationships among variables in structural equation models. A graphic representation of these models through *path diagrams* is an efficient way to communicate the abstract structural relationships. Due to their ability to provide an overview of complex variable relationships, path models have become an important tool in the field. Table 4.3 summarises the commonly used symbolism in structural equation modelling. The hypothesised relationships between the variables of this study are presented in the following subsections grouped by behavioural outcomes (subsection 4.4.1), brand relationship (subsection 4.4.2) and brand knowledge (subsection 4.4.3). The theoretic foundations of the model hypotheses have been derived in the corresponding sections of the literature in chapter 2. Figure 4.3 summarises the hypothesised structural relationships among the variables. The following sections will not only present the hypotheses to support the model but will also further the measurement of these variables.

4.4.1 Behavioural outcomes

No clear consensus exists about the measurement of loyalty. The measurement follows the conceptual review of literature and the consideration of the concepts that are most

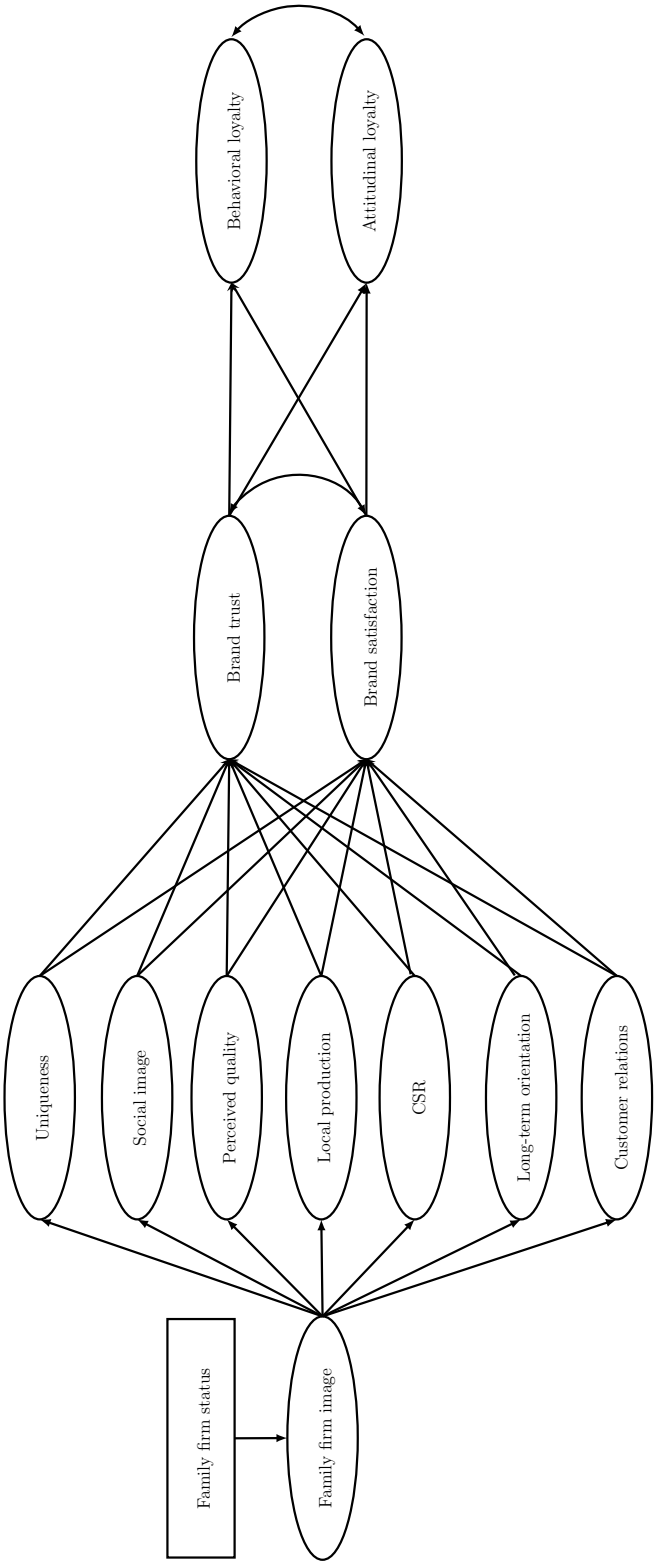


Figure 4.3: Structural equation model: schematic representation[a]

[a]In order to maintain the succinctness of the model, figure 4.3 only shows the relationships of the structural model and omits the variables and relationships of the measurement model.

Table 4.3: Symbols used in path diagrams

Symbol	Explanation
	A curved bidirectional arrow signifies a non-directional relationship between two variables (correlation / covariance).
	A directional arrow signifies a direct(ional) relationship between two variables.
	A rectangle signifies an indicator (observed) variable. Indicator variables are measured directly and are also called manifest variables.
	An oval signifies a latent (unobserved) variable.

appropriate for the purpose of this study. Scales exhibit wide variation and range from one item scales (i.e. Esch et al. 2006) to complex multidimensional higher-order constructs (Jones and Taylor 2007). The operationalisation of measurements has to identify the multidimensionality of loyalty reliably, but needs to be efficient to leave enough space for the other constructs in the questionnaire. Chaudhuri and Holbrook (2001) distinguish two dimensions of loyalty, which are attitudinal and behavioural loyalty. Although some research conceptualises more dimensions of loyalty, wide consensus exists in favour of a dual perspective and measurement through a higher-order bi-factor model of loyalty has been shown to be most appropriate (Jones and Taylor 2007, Kwon and Lennon 2009). Subsequent research, such as DeWitt et al. (2008), employs the same dual perspective of loyalty and derives a three item scale for each dimension based on a review of past literature. The author conceptualises behavioural loyalty based on the scale of Garbarino and Johnson (1999) and derives the measurement items of attitudinal loyalty from Ganesh et al. (2000). Very close linkages of these scales exist the pioneering work of Chaudhuri and Holbrook (2001). Due to the validation of Chaudhuri and Holbrook's scale in the context of actual behavioural outcomes (market share and price premium) preference is given to this scale in the present study. In addition, this scale has also been validated for use in a structural equation context by the authors. It can also be expected this the measurement of loyalty yields similar results as obtained through choice-based conjoint models (Agarwal and Rao 1996).

4.4.2 Brand relationship

4.4.2.1 Trust

Different concepts exist in the literature to measure trust. It has been pointed out by Moorman et al. (1993) that measures of trust should comprise two key dimensions: first, the belief about an exchange partner's trustworthiness, and second, a behavioural intention that reflects the reliance of a partner. Conceptual relevance of a measure that includes both aspects using an information economics view on brands has been laid out by Erdem et al. (2006). A four item measurement scale of trust which follows this conceptual definition by Moorman et al. (1993) has been presented by Chaudhuri and Holbrook (2001). This scale of trust is frequently used in literature and has been validated in consumer research in wine through a covariance-based structural equation model by Bianchi et al. (2014). Following the literature review in section 2.3.2.1, trust is closely linked to behavioural outcomes. For this reason the following two hypotheses can be derived for subsequent testing:

H_1: *Brand trust positively affects attitudinal loyalty.*

H_2: *Brand trust positively affects behavioural loyalty.*

4.4.2.2 Brand satisfaction

Fornell et al. (1996) uses three items to measure overall customer satisfaction. The measurement scale has been validated using large samples across several industries, including the food and beverage sector (Gruca and Rego 2005). The relevant three aspects of the scale closely relate to the conceptual grounding of satisfaction established by Oliver (1980). First, the overall quality of post purchase brand experience is assessed. Second, the expectancy disconfirmation, or if the brand falls short meeting an individual's expectations, is assessed. Third and last, the performance of the experience is compared to a customer's ideal conceptualisation of performance in the product category. Homburg et al. (2005) employ the scale specifically to investigate antecedents of customer loyalty and find a high reliability of the measurement scale. Fornell et al. (1996) develop the measurement scale of customer satisfaction initially in a partial least squared structural equation model context in their seminal paper, however, subsequent research shows application of the measurement scale in a covariance-based structural equation model context

(Luo and Bhattacharya 2006). Significant effects of brand satisfaction on behavioural outcomes have been pointed out in section 2.3.2.2. Hence, the following hypotheses derive for statistical evaluation:

H_3: *Brand satisfaction positively affects attitudinal loyalty.*

H_4: *Brand satisfaction positively affects behavioural loyalty.*

4.4.3 Brand knowledge

Brand image is expected to be an antecedent of brand trust and satisfaction (Esch et al. 2006), however used as an aggregate measure in the referenced work. Scales used to assess brand image differ widely by the research context in which they are used. Orth and Green (2009) suggest brand image to be a complex construct of multiple elements that is an antecedent of brand trust and satisfaction. Its measurement through multiple elements is thought to be more likely to isolate differential effects among family and non-family firms. To be able to measure different facets of brand image, previous efforts of research are synthesised: Anselmsson et al. (2014) identify different brand image items in the premium food sector, which are closely related the context of this study. In addition, Sageder et al. (2018) investigate key associations linked to family firms that constitute a competitive advantage. Section 2.3.3 has provided a detailed discussion of key associations with family business brands. The following subsections provide an overview of construct operationalisation and hypothesised between-construct linkages that emerge from the literature review.

4.4.3.1 Uniqueness

Uniqueness is measured on a four item Likert scale developed by Netemeyer et al. (2004). This scale has also been used previously in related studies in the food sector (Anselmsson et al. 2014). This scale is considered the most appropriate for this research, since other scales, i.e. Chaudhuri (2002), have shown less internal consistency. Further, initial scale validation by the authors has been carried out in a covariance-based structural equation model. The following linkages with other variables of this study can be hypothesised for subsequent testing based on the synthesised results of earlier studies that have been presented in section 2.3.3.1:

H_5: *Family firm image positively affects uniqueness.*

H_6: *Uniqueness positively affects brand trust.*

H_7: *Uniqueness positively affects brand satisfaction.*

4.4.3.2 Social image

From a conceptual point of view, two closely related concepts of social image and brand prestige coexist in the literature. In addition, research has used differential methodological approaches, such as unidimensional and compound measurement scales in the past. Because of the superior characteristics of multi-item constructs, this study adapts a measurement of social image by Sweeney and Soutar (2001). This operationalisation of the measurement on a four item Likert scale has been widely referenced and has shown a high reliability in past studies. In addition, Orth et al. (2005) have demonstrated previous successful application of the scale to the context of wine and provide further validation of the scale through confirmatory factor analysis. The successful use in past research advocates the use this scale of social image in favour of a scale of brand prestige, which has shown to be less common in past research. For this reason and in line with earlier research in the field, the scale of Sweeney and Soutar (2001) is adopted in this study. The review of literature in section 2.3.3.2 encourages a subsequent statistical testing of the following hypotheses:

H_8: *Family firm image positively affects social image.*

H_9: *Social image positively affects brand trust.*

H_{10}: *Social image positively affects brand satisfaction.*

4.4.3.3 Perceived quality

The measurement instrument used in this study emanates from theoretic foundations in Sweeney and Soutar (2001). In their original work, the authors present a construct of quality using six Likert-type items. However, Walsh et al. (2014) have shown that the quality scale can be shortened to a three item scale without a loss of measurement reliability. A similar three item scale has been developed independently by Netemeyer

et al. (2004) based on the original conceptual foundation of Sweeney and Soutar (2001). Due to its wide application in research and prior publication to Walsh et al. (2014), the scale of Netemeyer et al. (2004) is adapted in this research. The high internal consistency of this scale has been confirmed by Anselmsson et al. (2014) in a food-related context. The following hypotheses about the linkages of perceived quality with other constructs of this study can be derived based on the literature review in section 2.3.3.3:

H_{11}: *Family firm image positively affects perceived quality.*

H_{12}: *Perceived quality positively affects brand trust.*

H_{13}: *Perceived quality positively affects brand satisfaction.*

4.4.3.4 Localness

A three item Likert-type instrument of localness developed by Steenkamp et al. (2003) has been chosen for measurement of the relevant latent variable in this study. The scale builds on the theoretic framework of Ger (1999). More recent research has successfully employed the measurement instrument in a covariance-based structural equation context for food and non-food products and confirmed scale reliability (Özsomer 2012, Swoboda et al. 2012). The following hypotheses about the relationships with other variables of this study derive from the review of literature in section 2.3.3.4:

H_{14}: *Family firm image positively affects localness.*

H_{15}: *Localness positively affects brand trust.*

H_{16}: *Localness positively affects brand satisfaction.*

4.4.3.5 Corporate social responsibility (CSR)

The research field of corporate social responsibility is rather fragmented and influenced by a diverse set of scholarly disciplines (Aguinis and Glavas 2012). As there is not only a single angle that can be taken, this research adapts a marketing perspective on corporate social responsibility. Due to the many facets of corporate social responsibility, researchers voice difficulties in measuring this construct appropriately (Anselmsson et al. 2014). In

order to measure related perceptions of corporate social responsibility at an aggregate level, Wagner et al. (2009) have developed a widely-referenced scale of corporate social responsibility. This three item Likert scale has been used in covariance-based structural equation models and has shown high internal consistency in past studies (cp. El Akremi et al. 2018). The review of literature in section 2.3.3.5 suggests that corporate social responsibility is linked to other constructs of this study, leading to the following hypotheses:

H_{17}: *Family firm image positively affects corporate social responsibility.*

H_{18}: *Corporate social responsibility positively affects brand trust.*

H_{19}: *Corporate social responsibility positively affects brand satisfaction.*

4.4.3.6 Long-term orientation

In current research no unique perspective to measure the long-term orientation of a business exists (Lumpkin et al. 2010). Even more in the context of this study, which investigates the perceived long-term orientation from a consumer viewpoint, measures appear to be developed even less. In order to attribute this issue, Bearden et al. (2006) developed a frequently referenced survey instrument of long-term orientation, which measures long-term orientation from a planning and tradition point of view on two individual scales. Subsequent applications in consumer research have shown the preferential use of the planning subscale (Kopalle et al. 2010), which is also favoured by the definition of long-term orientation used in this research. While Bearden et al. (2006) favour the use of a four item scale, Kopalle et al. (2010) remove one item, which showed to potentially improve the psychometric quality of the scale (Bruner 2012, 406). A further scale by Lohtia et al. (2009) emerged in the literature between this time span of scale evolution. This three item Likert scale exhibits a higher composite reliability, and is very similar the initial propositions of Bearden et al. (2006). The authors have validated this scale in a covariance-based structural equation context, which increases its suitability for use in the present study. The prior literature review in section 2.3.3.6 leads to assume the presence of the following relationships with further latent variables of this study. The following hypotheses reflect these relationships:

H_{20}: *Family firm image positively affects long-term orientation.*

H_{21}: *Long-term orientation positively affects brand trust.*

H_{22}: *Long-term orientation positively affects brand satisfaction.*

4.4.3.7 Customer orientation

It is assumed that customer orientation is one of the most important elements associated with corporate brand image. Saxe and Weitz (1982) propose a 24 item Likert-type measurement instrument of customer orientation. Despite the importance of the construct, this operationalisation supersedes the scope of a given study in many settings. More recently, Walsh and Beatty (2007) have developed a scale that provides an aggregate measurement of customer orientation, which is more appropriate in the context of this study. Bartikowski et al. (2011) have further synthesised the scale of customer orientation to a three item Likert-type scale which has been validated across three countries in the food and retailing sector. Due to its extensive validation, the scale of Bartikowski et al. (2011) is adopted in the present research. The literature review in section 2.3.3.7 leads to assume that several relationships with other latent variables of this study exist. For this reason, the following hypotheses are introduced for subsequent statistical analysis:

H_{23}: *Family firm image positively affects customer orientation.*

H_{24}: *Customer orientation positively affects brand trust.*

H_{25}: *Customer orientation positively affects brand satisfaction.*

4.4.3.8 Family firm image

Earlier studies have used either dichotomous measurement (Binz et al. 2013) or in fewer cases continuous multi-item scales (Beck and Kenning 2015) to assess the family nature of firms. When a dichotomous measure of family firm status is implemented, primarily categorical comparisons can be drawn between family and public firms (Binz et al. 2013). While family firm status is one measure used in the afore referenced study, this operationalisation shows some limitations. Through the additional use of Beck and Kenning's scale in the present study, the differential post-purchase image can also be measured within the groups of family and non-family firms through the use of a continuous scale. This hybrid approach is of high relevance as it has to be assumed that heterogeneity among

the group of family firms exists with respect to the intrinsic family identity of a firm and its communication to stakeholders. Heine et al. (2016) argue that family businesses in the wine sector communicate their family identity to differentiate themselves from their competitors, for instance though emphasis of individual family heritage (Beverland 2006, Blombäck and Brunninge 2013). Although little quantitative evidence exists at this point, Carrigan and Buckley (2008) as well as Binz et al. (2013) find evidence that family firm status has a positive influence on consumer perception of these firms, especially when there is a high perceived uncertainty about intrinsic product characteristics (Beck and Kenning 2015). Adding to this, Blombäck (2011) argues that the wide prevalence of family firms in the business environment increases the number of associations which consumers relate with this type of company. Based on these previous findings, interaction effects between actual family firm status (cp. Binz et al. 2013) and the consumer perceived family firm image (cp. Beck and Kenning 2015) are assumed and lead to the following hypothesis:

H_{26}: *Family firm status positively affects family firm image.*

Chapter 5

Analysis

Earlier research in multi-national branding research has used mixed research methodologies. Erdem et al. (2006) combine the estimation of country-level structural equation models and mixed multinomial logistic choice models to test the role of brand and cultural constructs in the choice process. The present research utilises the same combination of research methods to provide robust answers to the research questions presented in section 3. Before performing a multivariate analysis, the data gathered through the survey instrument is analysed in a univariate way. While the univariate analysis represents a basic explorative data assessment, the multivariate analysis is grounded on a sophisticated analytical framework. The following sections provide a detailed description of the multivariate analytical framework that has been applied to the data.

5.1 Research question 1

The estimation of a multinomial logistic regression model constitutes the core of the multivariate analysis performed to answer the first research question. The methodological selection of a discrete choice experiment mimics actual choice situations and avoids many problems that are know to exist with stated preferences. Discrete choice experiments are based on random utility theory (McFadden 1973), which suggests that the utility of a product can be expressed as a sum function of individual product attributes. Different possible functional specifications exist based on the assumptions taken about the underlying preference function. Rao (2014) proposes a distinction in categorical and quantitative

attributes. The former are commonly implemented with dummy coded variables using $n_i - 1$ dummy variables for each attribute i with n_i levels. Quantitative attributes can be incorporated into the preference function using multiple ways. The different possibilities of analytical specification justify the definition of multiple utility functions that can be compared to each other using statistical testing procedures. For instance, quantitative attributes can be either modelled through linear and non-linear terms. Allowing for non-linearities in the utility function "has clear advantages, although the majority of work in the area of discrete choice modelling relies on a linear formulation" (Hess 2005, 18). Particularly for quantitative attributes, such as price, non-linearities may be expected due to the signalling function of this attribute. Sennhauser (2010) provides further support for this assumption and finds that the common linear specification of effects in choice models falls short to meet the natural shape of the preference function. Further, decreasing marginal utilities and gain-loss asymmetries imply that utility functions in choice experiments cannot by default be expected to have a linear mathematical functional form (Hoyos 2010). The author further argues that "a constant marginal utility of income[1] is usually assumed because it facilitates the estimation of welfare measures, although it may not always be reasonable" (Hoyos 2010, 1597). More recently, research in the field of choice modelling allows for the non-linearity of quantitative attributes, such as price, when defining the utility function (Swait et al. 2016). Evidence for an inverted U-shaped relationship of the price-utility function exists specifically in the case of wine (Hardt et al. 2012, Lecat et al. 2016). This research follows these recent advances in the field by implementing different model specifications and comparing the fit measures for these models. Linear effects are the most common way to specify the utility function in a choice-based conjoint analysis. Linear effects can either be operationalised using dummy variables or interval scaled variables. In order to make the methodology more stringent, quantitative attributes, i.e. price, are modelled as such. First, the utility function for the linear model

[1] In our case product price is used to measure the monetary trade-off with other attributes instead of the quoted example of income. Nonetheless, the rationale to assume that the marginal utility of the price of a bottle of wine is not constant is the same that is behind the income variable of the quoted study.

with interactions is defined:

$$
\begin{aligned}
U_{\text{linear};mj} &= \boldsymbol{\beta}\boldsymbol{x}_j + \epsilon_{mj} && (5.1)\\
&= U_{\text{ori}}(\boldsymbol{x}_{\text{ori;j}}) + U_{\text{rec}}(x_{\text{rec;j}}) + U_{\text{med}}(x_{\text{med;j}}) \\
&\quad + U_{\text{fam}}(x_{\text{fam;j}}) + U_{\text{pri}}(x_{\text{pri;j}}) + U_{\text{pri}\times\text{fam}}(x_{\text{pri;j}}, x_{\text{fam;j}}) + \epsilon_{mj} && (5.2)\\
&= \boldsymbol{\beta}_{\text{ori}}\boldsymbol{x}_{\text{ori;j}} + \beta_{\text{rec}}x_{\text{rec;j}} + \beta_{\text{med}}x_{\text{med;j}} \\
&\quad + \beta_{\text{fam}}x_{\text{fam;j}} + \beta_{\text{pri}}x_{\text{pri;j}} + \beta_{\text{pri}\times\text{fam}}x_{\text{pri;j}}x_{\text{fam;j}} + \epsilon_{mj} && (5.3)
\end{aligned}
$$

Equation 5.2 exhibits the utility of profile j for an individual m. The component utility function $U_{\text{ori}}(\boldsymbol{x}_{\text{ori;j}})$ of the origin variable $\boldsymbol{x}_{\text{ori;j}}$ consists of an $n-1 \times n-1$ diagonal matrix $\boldsymbol{x}_{\text{ori}}$ for each profile j representing the n individual origins. For each profile one matrix element x_{ii} takes the value 1 if a wine is from origin $i+1$, where $i+1$ equals the level id in table 4.1. The origin-specific coefficients are contained in a $n-1 \times 1$ column vector $\boldsymbol{\beta}_{\text{orig}}$. Further terms for component utilities $U_{\text{rec}}(x_{\text{rec;j}})$ of the binary attribute recommendations and component utilities $U_{\text{med}}(x_{\text{med;j}})$ for the binary attribute of medals are introduced. The key focus of the analysis is the investigation of the relationship between the family firm status $x_{\text{fam;j}}$ of a firm and the price $x_{\text{pri;j}}$ of the profile j. In order to reach a high level of detail of the analysis, component utility functions for both attributes $U_{\text{fam}}(x_{\text{fam;j}})$, $U_{\text{pri}}(x_{\text{pri;j}})$ are introduced together with an additional interaction utility term $U_{\text{pri}\times\text{fam}}(x_{\text{pri;j}}, x_{\text{fam;j}})$ for the variables.
This linear specification is extended by a curvilinear model which implements a quadratic term in the utility function to allow for changing marginal utility at different price levels[2]. The component utility function $U_{\text{pri}}(x_{\text{pri;j}})$ shown in equation 5.2 is altered as follows to model these relationships:

$$
U_{\text{pri}}(x_{\text{pri;j}}) = \beta_{\text{pri}}x_{\text{pri;j}} + \beta_{\text{pri\_quadratic}}x^2_{\text{pri;j}} \tag{5.4}
$$

[2] Osborne (2014) provides an overview about the modelling of curvilinear effects in logistic regression models. Due to the mathematical similarities between simple logistic regression and multinomial regression models this process can also be applied within the context of modelling consumer choice.

Further, also a cubic price relationship is introduced in a third model, by altering equation 5.2 through the following substitution:

$$U_{\text{pri}}(x_{\text{pri;j}}) = \beta_{\text{pri}} x_{\text{pri;j}} + \beta_{\text{pri\_quadratic}} x^2_{\text{pri;j}} + \beta_{\text{pri\_cubic}} x^3_{\text{pri;j}} \tag{5.5}$$

In order to avoid a high correlation of the linear and higher order price terms and to avoid multicollinearity in the models for the quadratic and cubic model specification in equation 5.4 and 5.5 the price variable has been mean-centred and standardised. This proceeding further improves the comparability of the results between the different models and countries. Since this proceeding has already been respected during the stage of the experimental design all price points could be derived accordingly.

5.1.1 Logistic models

Through equation 5.2 and the substitutions of the price component utility function with 5.4 and 5.5, three individual models have been introduced. The model is a logit model with two alternatives. The utility functions for the both alternatives V_1 and V_2 contain an alternative specific constant. Since the model would however not be identified with two alternative specific constants, the constant for alternative two is constrained to zero. The probability P for the choice of one alternative in a choice set with two alternatives can be defined as (cp. Bierlaire 2016):

$$P(i|\{1,2\};\boldsymbol{x},\boldsymbol{\beta}) = \frac{e^{V_i(\boldsymbol{x},\boldsymbol{\beta})}}{e^{V_1(\boldsymbol{x},\boldsymbol{\beta})} + e^{V_2(\boldsymbol{x},\boldsymbol{\beta})}} \tag{5.6}$$

In order to obtain the estimates $\hat{\boldsymbol{\beta}}$ for the parameter vector a maximum likelihood estimator is used, which maximises the probability of the data $p(y_1,\ldots,y_N|\boldsymbol{\beta}) := L(\boldsymbol{\beta})$ as a function of the parameter vector $\boldsymbol{\beta}$:

$$\hat{\boldsymbol{\beta}} = \arg\max_{\boldsymbol{\beta}} L(\boldsymbol{\beta}) \tag{5.7}$$

Hence, the likelihood function expresses the probability of joint occurrence of the given data in the sample with N observations:

$$L(\boldsymbol{\beta}) = \prod_n P(i_n|\{1,2\}; \boldsymbol{x}, \boldsymbol{\beta}) \tag{5.8}$$

By maximising this likelihood, the parameter vector estimate $\hat{\boldsymbol{\beta}}$ is obtained, which fits the data set best. Equation 5.8 expresses this by the factorisation of the individual probabilities of the choice realisation i_n of the n-th choice set.
For better numeric properties the likelihood function in equation 5.8 can be transformed using a (monotonic) logarithmic transformation:

$$l(\boldsymbol{\beta}) = \log L(\boldsymbol{\beta}) = \sum_n \log P(i_n|\{1,2\}; \boldsymbol{x}, \boldsymbol{\beta}) \tag{5.9}$$

The maximization of the log-likelihood function $l(\boldsymbol{\beta})$ is performed in `Biogeme` (Bierlaire 2016) using the `BIO` trust-region algorithm. Due to the nature of the numerical optimisation, it cannot be guaranteed that global maxima are found and algorithms get caught in local maxima. In order to counterfeit this drawback multiple runs of the algorithms using different starting values is advised.
The comparison of the different models is performed using the likelihood ratio statistic, which is defined as follows:

$$\text{LR} = -2\left[l(\hat{\boldsymbol{\beta}}_0) - l(\hat{\boldsymbol{\beta}}_1)\right] = -2\log\frac{L(\hat{\boldsymbol{\beta}}_0)}{L(\hat{\boldsymbol{\beta}}_1)} \tag{5.10}$$

The assumption of the test statistic in equation 5.10 is that under the null hypothesis the true value of $\boldsymbol{\beta}$ is assumed to be $\hat{\boldsymbol{\beta}}_0$ [3], unless it can be shown that $\hat{\boldsymbol{\beta}}_1$ is a better estimate for $\boldsymbol{\beta}$:

$$H_0 : \boldsymbol{\beta} = \hat{\boldsymbol{\beta}}_0 \quad \text{vs.} \quad H_1 : \boldsymbol{\beta} = \hat{\boldsymbol{\beta}}_1 \tag{5.11}$$

The likelihood ratio statistic shown in equation 5.10 asymptotically follows a $\chi^2_{\text{df}_1-\text{df}_0}$ distribution. H_0 is rejected at a significance level α if:

$$\text{LR} > \chi^2(1-\alpha, \text{df}_1 - \text{df}_0) \tag{5.12}$$

[3] The parameter vector of the null model is indicated as $\hat{\boldsymbol{\beta}}_0$.

Apart from comparative testing the goodness of fit of two models as stated above, a coefficient of determination for likelihood-based estimation processes can be calculated as

$$\rho^2 = 1 - \frac{l(\hat{\boldsymbol{\beta}}_1)}{l(\hat{\boldsymbol{\beta}}_0)} \tag{5.13}$$

where $l(\hat{\boldsymbol{\beta}}_0)$ in equation 5.13 indicates the null log-likelihood of a model where $\boldsymbol{\beta} = \mathbf{0}$ and $l(\hat{\boldsymbol{\beta}}_1)$ represents the log-likelihood of the estimated model (McFadden 1973). Based on its definition $\rho^2 \in [0; 1]$. An adjusted version of this measure which controls for the number of model parameters K is defined a follows:

$$\bar{\rho}^2 = 1 - \frac{l(\hat{\boldsymbol{\beta}}_1) - K}{l(\hat{\boldsymbol{\beta}}_0)} \tag{5.14}$$

5.1.2 Logistic mixture models

While one common approach of model estimation has been presented in the previous subsection, a further approach extends this maximum likelihood estimation through a simulation-based approach and overcomes the strict assumption of preference homogeneity in the sample by explicitly allowing for a random variation of individuals' preferences. This is important to consider since one assumption of the logistic model is that the error terms are independent identically distributed across all alternatives and individuals. This assumption however appears strict and restrictive in many scenarios. Logit mixture models are the most recent set of models that emanate from discrete choice theory. In the past limitations have existed particularly with respect to estimation methods, which have recently been addressed through the advent of simulation methods (Train 2009). Mixture models can hence incorporate the full information of repeated measures in many choice models.

Formally, a mixed model extends the logit specification shown in equation 5.6 by a density function $f(\boldsymbol{\beta})$. The actual probability of choosing an alternative out of a set of two given alternatives can then be defined as the integral over this density:

$$P(i|\{1,2\}; \boldsymbol{x}, \boldsymbol{\beta}|\boldsymbol{\theta}) = \int \frac{e^{V_i(\boldsymbol{x},\boldsymbol{\beta})}}{e^{V_1(\boldsymbol{x},\boldsymbol{\beta})} + e^{V_2(\boldsymbol{x},\boldsymbol{\beta})}} \, f(\boldsymbol{\beta}|\boldsymbol{\theta}) \, \mathrm{d}\boldsymbol{\beta} \tag{5.15}$$

Hence, the probability defined in equation 5.15 can be defined as a weighted average of the logit function over a set of taste coefficients $\boldsymbol{\beta}$ that vary over decision makers. The density function $f(.)$ is also called mixing function and is the source of the model's name. The parameters $\boldsymbol{\theta}$ describe the distribution of this density function. Different specifications of this mixing function are possible. One possibility for the mixing function is to take discrete values, which makes the model a special type of logistic mixture model, which is called latent class model. However, in most applications of mixture models a multivariate normal distribution for $\boldsymbol{\beta}$ is assumed.

From a view directed towards the implementation of the model in a simulation, a different representation of the model implied in equation 5.15 is possible. Instead of assuming random coefficients that originate from a mixing function, also an approach of modelling random error components that capture the heterogeneity of individuals within the population sample exist. In this representation $\boldsymbol{\beta}$ can be decomposed in a deterministic fixed part $\boldsymbol{\alpha}$ and a respondent-specific part $\boldsymbol{\mu}_n$. Following the specification of the utility function in equation 5.1 and Train (2009, 143) the utility of a profile j for an individual m can be represented as:

$$U_{mj} = \boldsymbol{\beta}_m(\boldsymbol{\theta})\boldsymbol{x}_j + \epsilon_{mj} \tag{5.16}$$

$$= \boldsymbol{\alpha}\boldsymbol{x}_j + \boldsymbol{\mu}_m(\boldsymbol{\theta})\boldsymbol{z}_{mj} + \epsilon_{mj} \tag{5.17}$$

The vector $\boldsymbol{\mu}_n(\boldsymbol{\theta})$ in equation 5.17 specifies the random terms with zero mean of the model, while $\boldsymbol{z}_{mj}$ are the error terms for the utility of choice profile j of an individual m. The multi-dimensional integral in equation 5.15 is required to be determined on a per-respondent basis. No closed solution exists for this integration and hence a numeric approximation is required. Bierlaire (2015) shows that equation 5.15 can be approximated as:

$$\hat{P}_i \approx \frac{1}{R}\sum_{r=1}^{R}\frac{e^{V_i(\boldsymbol{x},\boldsymbol{\beta_r})}}{e^{V_1(\boldsymbol{x},\boldsymbol{\beta_r})} + e^{V_2(\boldsymbol{x},\boldsymbol{\beta_r})}} \tag{5.18}$$

The approximation shown in equation 5.18[4] is achieved through numeric integration using a Monte-Carlo simulation with R draws of $\boldsymbol{\beta}(\boldsymbol{\theta})$. For the case of panel data, the simulated log likelihood l_{sim} can then be defined in analogy to equation 5.9, however considering that

[4] this representation is using the random coefficient representation of the logit mixture model shown in equation 5.16

the integration in equation 5.15 and the Monte Carlo draws in equation 5.18 are performed for the joint probability across all choices of a respondent. This process ensures that the random variables within one draw r are the same across all k choices of an individual m (i represents the chosen alternative), which is what is required to model homogeneity of an individual's preferences, but allowing for preference heterogeneity across the sample (Hess 2005, 47):

$$l_{\text{sim}}(\boldsymbol{\beta}, \boldsymbol{\theta}) = \sum_m \log \int \prod_k \frac{e^{V_i(\boldsymbol{x}_k, \boldsymbol{\beta})}}{e^{V_1(\boldsymbol{x}_k, \boldsymbol{\beta})} + e^{V_2(\boldsymbol{x}_k, \boldsymbol{\beta})}} \, f(\boldsymbol{\beta}|\boldsymbol{\theta}) \, \mathrm{d}\boldsymbol{\beta} \tag{5.19}$$

$$\approx \sum_m \log \frac{1}{R} \sum_r \prod_k \frac{e^{V_i(\boldsymbol{x}_k, \boldsymbol{\beta}_r)}}{e^{V_1(\boldsymbol{x}_k, \boldsymbol{\beta}_r)} + e^{V_2(\boldsymbol{x}_k, \boldsymbol{\beta}_r)}} \tag{5.20}$$

This specification can be particularly advocated since each respondent has taken repeated choices within the same questionnaire. Hence it can be assumed that the preferences within an individual remain constant. Equation 5.20 can be implemented in `BIOGEME` through the use of different iterators that are provided with the software package and the specification of random variables following the approach shown in equation 5.17. As the simulation process with multiple random variables becomes computationally intense, the number of draws R in the integration step have to be considered carefully to achieve an acceptable trade-off between resource requirements to run the simulation and achieved precision of results. Results from a numerical study in Bierlaire (2015) indicate that with $R = 500$ Monte Carlo draws sufficient precision of results can be achieved.

5.1.3 Estimating willingness to pay

5.1.3.1 Logistic models

After the estimation of the different utility functions (cp. equations 5.2 - 5.5) the marginal worth for the family firm attribute can be computed. The worth of the family attribute is defined by the relationship between the variables price, family and their effect on the utility function. First, the partial derivative of the utility function for the family attribute is calculated[5]. To avoid redundancies, only the derivative of the cubic utility function are

[5]Since we do not need to distinguish different profiles j and individuals i after the estimation of the parameter vector, these indexes are neglected

shown below, since the other two models are special cases where at least one of the higher order betas ($\beta_{\text{pri\_quadratic}}$, $\beta_{\text{pri\_cubic}}$) equals zero.

$$\frac{\partial U_{\text{cubic}}}{\partial x_{\text{fam}}} = \beta_{\text{fam}} + \beta_{\text{pri}\times\text{fam}} x_{\text{pri}} \tag{5.21}$$

$$\frac{\partial U_{\text{cubic}}}{\partial x_{\text{pri}}} = \beta_{\text{pri}} + 2\beta_{\text{pri\_quadratic}} x_{\text{pri}} + 3\beta_{\text{pri\_cubic}} x_{\text{pri}}^2 + \beta_{\text{pri}\times\text{fam}} x_{\text{fam}} \tag{5.22}$$

In order to estimate the willingness to pay for x_{fam} a conditionally indirect utility function $U_{\text{cubic}}(x_{\text{fam}}, x_{\text{pri}})$ is assumed where all other attributes (cp. equation 5.3) are considered as constant. In this case the total differential of the utility function is:

$$\mathrm{d}U = \frac{\partial U_{\text{cubic}}}{\partial x_{\text{fam}}} \mathrm{d}x_{\text{fam}} + \frac{\partial U_{\text{cubic}}}{\partial x_{\text{pri}}} \mathrm{d}x_{\text{pri}} \tag{5.23}$$

In order to estimate the trade-off between the both variables it is assumed that the total differential $\mathrm{d}U = 0$. Formulas 5.21 and 5.22 can be inserted in equation 5.23, can then be solved for $\frac{\mathrm{d}x_{\text{pri}}}{\mathrm{d}x_{\text{fam}}}\big|_{\mathrm{d}U=0}$:

$$\frac{\mathrm{d}x_{\text{pri}}}{\mathrm{d}x_{\text{fam}}}(x_{\text{pri}}) = -\frac{\frac{\partial U_{\text{cubic}}}{\partial x_{\text{fam}}}}{\frac{\partial U_{\text{cubic}}}{\partial x_{\text{pri}}}} \tag{5.24}$$

$$= -\frac{\beta_{\text{fam}} + \beta_{\text{pri}\times\text{fam}} x_{\text{pri}}}{\beta_{\text{pri}} + 2\beta_{\text{pri\_quadratic}} x_{\text{pri}} + 3\beta_{\text{pri\_cubic}} x_{\text{pri}}^2 + \beta_{\text{pri}\times\text{fam}} x_{\text{fam}}} \tag{5.25}$$

Equation 5.25 shows that the marginal willingness to pay is a function of the price x_{pri}. This is both attributable to the interaction effect between the family and price variables (cp. numerator) and due to the non-linear effects of the price variable (cp. denominator), which has been modelled in equations 5.2 - 5.5. While equation 5.25 gives a detailed overview of the trade-off between the price and the family attributes, the ratio depends on the algebraic sign of equations 5.21 and 5.22.

From an economic point of view it is reasonable to define the willingness to pay positive as long as the marginal utility of the relevant attribute (x_{fam}) is positive[6]. However, if

[6] According to equation 5.25 this holds true as long as the numerator remains positive and the denominator is negative. A negative denominator is the classic assumption when estimating the willingness to pay in most choice-based conjoint scenarios, due to the negative utility for increasing prices. However, Hardt et al. (2012) and Lecat et al. (2016) have shown that this classic assumption is not valid in the choice of wine.

the marginal utility of x_{pri} is positive, this would lead to a negative willingness to pay. This is straightforward to see from equation 5.23 and the condition $\mathrm{d}U = 0$. But in this case it is still reasonable to define the willingness to pay positive, since the marginal utility for x_{fam} has not changed. As the arithmetic sign of $\frac{\partial U_{\text{cubic}}}{\partial x_{\text{pri}}}$ is not known due to the non-linear specification in equation 5.22 the absolute value of this term is assumed for a better economic interpretation:

$$\text{WTP}\left(x_{\text{pri}}\right) \equiv \frac{\frac{\partial U_{\text{cubic}}}{\partial x_{\text{fam}}}}{\left|\frac{\partial U_{\text{cubic}}}{\partial x_{\text{pri}}}\right|} \tag{5.26}$$

From a practitioner's perspective willingness to pay estimations may lead to complications if $\frac{\partial U_{\text{cubic}}}{\partial x_{\text{pri}}}$ is approaching small values close to zero. In this case when estimating overall willingness to pay it is beneficial to estimate the willingness to pay for the average value the equations 5.21 and 5.22 take within the price range of interest. The average value of a function f can be obtained using the following relationship:

$$\bar{f} = \frac{1}{b-a}\int_a^b f(x)\ dx \tag{5.27}$$

When approaching the zero values in equation 5.22, an integral of equation 5.26 would diverge. In order to calculate the average willingness to pay $\overline{\text{WTP}}$ a different approach is implemented by defining $\overline{\text{WTP}}$ as the ratio of the mean marginal utilities of price and the family attribute within the interval $[a, b]$:

$$\overline{\text{WTP}}(a,b) \equiv \frac{\frac{1}{b-a}\int_a^b \frac{\partial U_{\text{cubic}}}{\partial x_{\text{fam}}}\,\mathrm{d}x_{\text{pri}}}{\frac{1}{b-a}\int_a^b \left|\frac{\partial U_{\text{cubic}}}{\partial x_{\text{pri}}}\right|\mathrm{d}x_{\text{pri}}} = \frac{\int_a^b \frac{\partial U_{\text{cubic}}}{\partial x_{\text{fam}}}\,\mathrm{d}x_{\text{pri}}}{\int_a^b \left|\frac{\partial U_{\text{cubic}}}{\partial x_{\text{pri}}}\right|\mathrm{d}x_{\text{pri}}} \tag{5.28}$$

To determine the integral in the denominator of equation 5.28 it is necessary to know the zero values of the denominator of equation 5.22. For quadratic equations the following analytical solution can be determined[7]:

$$z_{1/2} = \frac{-2\beta_{\text{pri\_quadratic}} \pm \sqrt{4\beta^2_{\text{pri\_quadratic}} - 12\beta_{\text{pri\_cubic}}\left(\beta_{\text{pri}} + \beta_{\text{pri}\times\text{fam}}x_{\text{fam}}\right)}}{6\beta_{\text{pri\_cubic}}} \tag{5.29}$$

[7]This example applies to the cubic model specification only. Lower order models require an adapted analytical solution.

If $z_{1/2} \in [a, b]$ a step-wise integration between these zero values has to be performed. This result shows that an analytical solution for equation 5.28 exists. However, in order to standardise the analytical process for all models, a numerical integration is preferred to be able to use a singular programmatic implementation in the linear and quadratic models as well.

5.1.3.2 Logistic mixture models

The estimation of willingness to pay in logistic mixture models can cause certain difficulties, which emanate from the very definition of willingness to pay as a ratio of the partial derivatives of the utility function for an attribute and cost. Since the mixture model imposes a mixing distribution on the parameter estimates, the partial derivatives also follow a stochastic process. Hence, no fixed moments for a variable that derives from the ratio of two random variables may exist. Particularly the derivative of price, which enters the denominator of a willingness to pay estimation (cp. equation 5.24) presents particular difficulties. In the past researchers have used several techniques, such as censoring of the distributional assumption or the simulated data. However, this practice is assumed to be masking the actual problem that finite moments do not exist and the computation of distributional parameters, such as mean or standard deviation, is not meaningful (Daly et al. 2012)[8]. In particular no finite moments exist for the ratio of two normally distributed variables, hence rendering the computation of a willingness to pay impossible or meaningless (Bliemer and Rose 2013). This fact presents a dilemma for a researcher, since the assumption of fixed price coefficients, which in model specifications without interaction effects produces a theoretically defined willingness to pay, has been found in a sample study by Bliemer and Rose (2013) to result in worse model fit than estimating the cost coefficient as random parameter. However, both Daly et al. (2012) and Bliemer and Rose (2013) propose the median as a relevant measure to identify the willingness to pay. Another alternative, which has been proposed by Train and Weeks (2005) is the specification of the model in willingness to pay space. During this specification the model is parametrised with a random coefficient for willingness to pay for which distributional assumptions can be taken. One drawback of this approach is that

[8] Also in the non-linear specification of the cost function in section 5.1.3.1 difficulties are observed when the denominator in equation 5.24 approaches zero. However, this behaviour is related to the algebraic structure of the derivative and is conceptually different from a stochastic process causing such behaviour.

the parametrisation of a model in willingness to pay space is related to inferior model fit compared to a model specification in preference space. The feasible alternatives to estimate willingness to pay in logistic mixture models do not allow for an exact replication of the estimation chosen for the multinomial logistic model in subsection 5.1.3, since a ratio of two normals as indicated by Daly et al. (2012) would not have finite moments. Two possible avenues for the adaptation of the estimation of willingness to pay exist. First, the price parameter may be assumed not to follow a stochastic process and no interaction of the price family attribute is assumed. In this case only the numerator of equation 5.24 would follow a stochastic process (i.e. be normally distributed), while the denominator would be assumed to be distributed with zero variance. Second, another option can be an estimation of the model in willingness to pay space. This model specification allows to estimate a such model without such restrictive assumptions of the price variable. However, this comes at a constraint of an assumption of a linear price effect and the absence of attribute-price interaction effects. Despite these limitations, the estimations of models in willingness to pay space have enjoyed wide adoption when estimating the monetary worth of an attribute when using logistic mixture models.
The estimation of the model with a fixed price parameter may be considered a feasible option and provides several advantages as Revelt and Train (1999) point out: First, instabilities of mixed logit models may be avoided if not all parameters are assumed to follow a stochastic process. Second, difficulties in the evaluation of ratios of two stochastic variables can be avoided. Last, the authors argue that price coefficients may take undesired values with certain distribution and make a particular case that price coefficients are "necessarily negative" (Revelt and Train 1999, 15). However, the last point is arguable considering the findings of Hardt et al. (2012), who show that the marginal effect of price on the utility is a function of the actual price. In this regard earlier research by Hardt et al. as well as Lecat et al. have shown that the price-utility function show an inverted U-shape. Nevertheless, Revelt and Train present additional arguments to consider the price coefficient as a deterministic variable.

Willingness to pay space Model estimation in willingness to pay space requires a re-parametrisation of the model for the attribute coefficient. Through the algebraic transformation of the utility function it is possible to obtain a direct estimate for the willingness to pay with a pre-defined distribution for a an attribute of interest. In this light a utility

function can be defined based upon equation 5.1. The two major changes that need to be applied are the omission of the price-family interaction effect and the substitution of β_{fam} by

$$\beta_{\text{fam;m}} = -\lambda_m \beta_{\text{pri;m}} \tag{5.30}$$

The coefficient λ can then be defined as random variable which is a measure of an individual's willingness to pay.

$$\lambda_{\text{m}} = -\frac{\beta_{\text{fam;m}}}{\beta_{\text{pri;m}}} = \frac{\mathrm{d}x_{\text{pri;j}}}{\mathrm{d}x_{\text{fam;j}}} \tag{5.31}$$

It becomes obvious that through substituting $\beta_{\text{fam;m}}$ as proposed in equation 5.30, λ becomes a measure of willingness to pay (cp. equation 5.24) in a linear model specification without interaction effects. The utility of a profile j of an individual m which includes the willingness to pay for the family attribute can then be expressed as:

$$\begin{aligned} U_{\text{linear;mj}} &= \boldsymbol{\beta}_{\text{ori;m}} \boldsymbol{x}_{\text{ori;j}} + \beta_{\text{rec;m}} x_{\text{rec;j}} + \beta_{\text{med;m}} x_{\text{med;j}} \\ &\quad + \lambda_m \beta_{\text{pri;m}} x_{\text{fam;j}} + \beta_{\text{pri;m}} x_{\text{pri;j}} + \epsilon_{mj} \end{aligned} \tag{5.32}$$

In the model λ can be defined as a random variable with pre-defined properties, such as $\lambda \sim N(\mu, \sigma)$. In this model all other β coefficients are also assumed to follow a pre-defined distribution, which in this application is assumed to be a normal distribution.

Fixed price effect The estimation using random parameters for the attributes except for the price-related variables allows the estimation of the willingness to pay in a way, which is similar to the estimation described in section 5.1.3.1. However, one further difference separates the estimation of the mixed model. The interaction effect of the family attribute with the price attribute may be considered problematic as the beta coefficient enters the denominator of equation 5.24. If it is assumed that the preference of the family attribute follows a random process, then also the interaction of this variable with price would follow a random process. For this reason, if an interaction between these variables would be assumed, then the distribution of the willingness to pay again would not possess finite moments. The omission of the interaction effect can also be justified if the effect is not found to be significant[9].

[9] A pre-simulation of the models using random parameters for all variables shows that the interaction effect is only significant at a 5 percent level in one of the higher order (quadratic / cubic) models, namely

5.1.4 Relative attribute importance

The computation of relative attribute importance provides an aggregated overview of the overal importance of individual variables of the study. This can be done by considering how much an attribute affects the overall utility of a profile. This difference is computed using the levels of each attribute and aggregated. The utility range of an attribute can then be compared to the total utility range of the model and percentages can be calculated. The importance and rank of an attribute can be compared across the three countries since the values are ratio-scaled and have a clear minimum and maximum whose definition is consistent across different studies. It is however important to consider that the utility range also depends on the choice of attribute levels. For instance, if a narrower price range is chose, the relative attribute importance is considered lower than if a wider price range is chosen. In this study, this effect has been attributed through the choice of the same relative price levels across all countries. Further all other attributes and levels have been the same in the individual countries.

5.2 Research question 2

5.2.1 Structural equation models

Covariance-based structural equation models have been implemented to answer the second research question. It is important to say in the first place that the term *covariance-based structural equation models* only describes the family of analytical tools used. Differences between the operationalisation of the analytical methods exist depending on the goal of the analysis. Typically structural equation models are constituted from two submodels, which are the *measurement model* and the *structural model*. The measurement model consists of regression-like relationships among the latent variables. The measurement model, which is also called latent variable model defines the measurement of the latent variables and shares vast similarities with factor analysis. For this reason, whenever a structural equation model is analysed without structural model such analysis is called *confirmatory factor analysis* (Beaujean 2014). Such model still assumes a distinct

for the cubic model in the Australian sample. In all other cases significances are well above the 5 percent level for the higher order models.

structure of factors regarding the manifest variables. In absence of such assumptions for the latent variable model, this analysis would be called *exploratory factor analysis*.

5.2.1.1 Factor analytical foundation

Jöreskog (1969) has laid out the foundation of structural equation models in his seminal paper about confirmatory factor analysis - a special case of structural equation modelling. The author derives the confirmatory factor analysis model based on the basic assumption of factor analysis:

$$\boldsymbol{x} = \boldsymbol{\Lambda}\boldsymbol{\xi} + \boldsymbol{z} \tag{5.33}$$

In this case $\boldsymbol{x}$ is a $p \times 1$ random vector of p observed variables, $\boldsymbol{\Lambda}$ is the $p \times n$ factor loading matrix that transforms n latent variables in p observed variables. Hence $\boldsymbol{\xi}$ is a $n \times 1$ vector of factor scores of the latent variables. Since it is $n < p$, an observation x_p cannot be reproduced by $\boldsymbol{\lambda}_p\boldsymbol{\xi}$, a $p \times 1$ vector $\boldsymbol{z}$ is required that accounts for this non-explained observation-specific residual. The covariance of matrix $\boldsymbol{\Sigma}$ of the random vector $\boldsymbol{x}$ can be computed as

$$\boldsymbol{\Sigma} = E\left[(\boldsymbol{x} - \boldsymbol{\mu})(\boldsymbol{x} - \boldsymbol{\mu})'\right] = E\left[\boldsymbol{x}\boldsymbol{x}'\right] - \boldsymbol{\mu}\boldsymbol{\mu}' \tag{5.34}$$

where $E(\boldsymbol{x}) = \boldsymbol{\mu}$. Under the assumption that $\boldsymbol{x}$ is a vector of centred random variables, equation 5.34 simplifies to

$$\boldsymbol{\Sigma} = E\left[\boldsymbol{x}\boldsymbol{x}'\right] \tag{5.35}$$

The covariance matrix of the random variable $\boldsymbol{x}$ can be expressed based on the relationship shown in equations 5.33 and 5.35:

$$\begin{aligned}
\boldsymbol{\Sigma} &= E\left[(\boldsymbol{\Lambda}\boldsymbol{\xi} + \boldsymbol{z})(\boldsymbol{\Lambda}\boldsymbol{\xi} + \boldsymbol{z})'\right] && (5.36)\\
&= E\left[\boldsymbol{\Lambda}\boldsymbol{\xi}\boldsymbol{\xi}'\boldsymbol{\Lambda}'\right] + E\left[\boldsymbol{\Lambda}\boldsymbol{\xi}\boldsymbol{z}'\right] + E\left[\boldsymbol{z}\boldsymbol{\xi}'\boldsymbol{\Lambda}'\right] + E\left[\boldsymbol{z}\boldsymbol{z}'\right] && (5.37)\\
&= \boldsymbol{\Lambda}E\left[\boldsymbol{\xi}\boldsymbol{\xi}'\right]\boldsymbol{\Lambda}' + \boldsymbol{\Lambda}E\left[\boldsymbol{\xi}\boldsymbol{z}'\right] + E\left[\boldsymbol{z}\boldsymbol{\xi}'\right]\boldsymbol{\Lambda}' + E\left[\boldsymbol{z}\boldsymbol{z}'\right] && (5.38)
\end{aligned}$$

In equation 5.38 it becomes visible that $E\left[\boldsymbol{\xi}\boldsymbol{\xi}'\right]$ is the covariance matrix of the latent variables and is subsequently called $\boldsymbol{\Phi}$. Further, commonly it is assumed that the latent variables are uncorrelated with the residuals, and hence $E\left[\boldsymbol{\xi}\boldsymbol{z}'\right] = \boldsymbol{0}$. Further, $E\left[\boldsymbol{z}\boldsymbol{z}'\right] = \boldsymbol{\Psi}$

is a diagonal positive matrix. Using this symbolism equation 5.38 can be rewritten to:

$$\boldsymbol{\Sigma} = \boldsymbol{\Lambda}\boldsymbol{\Phi}\boldsymbol{\Lambda}' + \boldsymbol{\Psi} \tag{5.39}$$

Equation 5.39 is called the *fundamental factor theorem* (Thurstone 1935). In many classical applications, such as in factor analysis, it is assumed that the factors of the factor matrix $\boldsymbol{\xi}$ are orthogonal, which implies that $\boldsymbol{\Phi} = \boldsymbol{I}$, where $\boldsymbol{I}$ is an identity $n \times n$ matrix where $I_{ij} = \delta_{ij}$ and δ_{ij} represents the Kronecker delta. However, this orthogonality assumption is mostly abundant in the context of confirmatory factor analysis.

5.2.1.2 Simultaneous equations with latent variables

As the fundamental theorem of factor analysis has been derived, it will be subsequently shown how factor analysis relates to structural equation models, or more precisely to *simultaneous equations with latent variables*. Different approaches in order to present the related theoretical framework are possible. The two most common ways of mathematical representation are the use of algebraic equations as well as matrix equations (Mulaik 2009). While the latter may are more straightforward to understand, matrix equations are preferred in the following due to their succinctness and general validity[10].
First, it is important to distinguish *exogenous* and *endogenous variables* in the measurement model. Exogenous variables are latent variables that are not explained by the model, while endogenous variables are latent variables are explained by the model. Despite these differences, both types of variables share a measurement similar to the one presented in equation 5.33. Exogenous latent variables are represented through the vector $\boldsymbol{\xi}$ and are measured through the manifest variables $\boldsymbol{x}$ with a residual $\boldsymbol{\delta}$. Endogenous variables, represented through the vector $\boldsymbol{\eta}$, are measured through variables in the vector $\boldsymbol{x}$ with a residual $\boldsymbol{\epsilon}$. The following measurement equations derive based on this symbolism and the stated foundations in 5.33:

$$\boldsymbol{x} = \boldsymbol{\Lambda}_x\boldsymbol{\xi} + \boldsymbol{\delta} \tag{5.40}$$

$$\boldsymbol{y} = \boldsymbol{\Lambda}_y\boldsymbol{\eta} + \boldsymbol{\epsilon} \tag{5.41}$$

[10]The following representations closely follow the reasoning in Mulaik (2009).

The central part of the model is however represented by the relationships between the exogenous and endogenous variables. It is assumed that the variability of the endogenous variables $\boldsymbol{\eta}$ in the model can be explained though other endogenous variables, as well as through exogenous variables $\boldsymbol{\xi}$. Further, it is assumed that also a part of unexplained variability $\boldsymbol{\zeta}$ exists in the model.

$$\boldsymbol{\eta} = \boldsymbol{B}\boldsymbol{\eta} + \boldsymbol{\Gamma}\boldsymbol{\xi} + \boldsymbol{\zeta} \tag{5.42}$$

$\boldsymbol{B}$ represents a matrix of the regression coefficients of the endogenous variables in equation 5.42 . However, it is important to highlight that it is $b_{ii} = 0$, since a variable η_i can never occur simultaneously on both sides of the equation. Further, $\boldsymbol{\Gamma}$ represents the regression coefficients between the exogenous and endogenous variables. Equations 5.40 through 5.42 can be considered the three essential equations of the simultaneous equations model. Similar to the approach taken in subsection 5.2.1.1, the fundamental theorem of this simultaneous equation model can be derived by determining the variance-covariance structures of the afore mentioned three equations. This can be performed by applying equation 5.35 under the same assumptions stated in the above context. The most straightforward analogy applies when deriving the variance-covariance matrix for equation 5.40. The analytical solution can be obtained following the same pathway as described in equations 5.36 through 5.39:

$$\boldsymbol{\Sigma}_x = \boldsymbol{\Lambda}_x \boldsymbol{\Phi}_\xi \boldsymbol{\Lambda}_x' + \boldsymbol{\Theta}_\delta \tag{5.43}$$

In equation 5.43 $\boldsymbol{\Lambda}_x$ represent the factor loadings of the exogenous latent variables $\boldsymbol{x}$ and the related manifest variables $\boldsymbol{\xi}$. As it has been stated previously in section 5.2.1.1 $\boldsymbol{\Phi}_\xi$ is a variance covariance matrix of the latent exogenous variables and $\boldsymbol{\Theta}_\delta$ is a diagonal matrix containing the variances of the measurement errors of the exogenous manifest variables (Hoyle 2012, 132). The variance covariance matrix can be derived for the endogenous model variables (equation 5.41) in the same way:

$$\boldsymbol{\Sigma}_y = \boldsymbol{\Lambda}_y \boldsymbol{\Phi}_\eta \boldsymbol{\Lambda}_y' + \boldsymbol{\Theta}_\epsilon \tag{5.44}$$

The variance covariance matrix of the endogenous variables can be calculated through the relationship stated on equation 5.42 by solving for $\boldsymbol{\eta}$ and subsequently computing the

variance covariance matrix $\boldsymbol{\Phi}_\eta$. Solving equation 5.42 for $\boldsymbol{\eta}$ yields

$$\boldsymbol{\eta} = (\boldsymbol{I} - \boldsymbol{B})^{-1} (\boldsymbol{\Gamma}\boldsymbol{\xi} + \boldsymbol{\zeta}) \tag{5.45}$$

and results in the associated variance covariance matrix

$$\begin{aligned}
\boldsymbol{\Phi}_\eta &= E[\boldsymbol{\eta}\boldsymbol{\eta}'] && (5.46)\\
&= (\boldsymbol{I} - \boldsymbol{B})^{-1} E\left[(\boldsymbol{\Gamma}\boldsymbol{\xi} + \boldsymbol{\zeta})(\boldsymbol{\Gamma}\boldsymbol{\xi} + \boldsymbol{\zeta})'\right] (\boldsymbol{I} - \boldsymbol{B})^{-1'} && (5.47)\\
&= (\boldsymbol{I} - \boldsymbol{B})^{-1} E[(\boldsymbol{\Gamma}\boldsymbol{\xi} + \boldsymbol{\zeta})(\boldsymbol{\xi}'\boldsymbol{\Gamma}' + \boldsymbol{\zeta}')] (\boldsymbol{I} - \boldsymbol{B})^{-1'} && (5.48)\\
&= (\boldsymbol{I} - \boldsymbol{B})^{-1} E[\boldsymbol{\Gamma}\boldsymbol{\xi}\boldsymbol{\xi}'\boldsymbol{\Gamma}' + \boldsymbol{\zeta}\boldsymbol{\xi}'\boldsymbol{\Gamma}' + \boldsymbol{\Gamma}\boldsymbol{\xi}\boldsymbol{\zeta}' + \boldsymbol{\zeta}\boldsymbol{\zeta}'] (\boldsymbol{I} - \boldsymbol{B})^{-1'} && (5.49)\\
&= (\boldsymbol{I} - \boldsymbol{B})^{-1} (\boldsymbol{\Gamma}\boldsymbol{\Phi}_\xi\boldsymbol{\Gamma}' + \boldsymbol{\Psi}) (\boldsymbol{I} - \boldsymbol{B})^{-1'} && (5.50)
\end{aligned}$$

Orthogonality of the residuals in $\boldsymbol{\zeta}$ and the exogenous variables $\boldsymbol{\xi}$ has been assumed when deriving equation 5.50. Further, the variances of these residuals are summarised in a diagonal matrix $\boldsymbol{\Psi}$. Equation 5.50 can now be used to substitute $\boldsymbol{\Phi}_\eta$ in equation 5.44:

$$\boldsymbol{\Sigma}_x = \boldsymbol{\Lambda}_x (\boldsymbol{I} - \boldsymbol{B})^{-1} (\boldsymbol{\Gamma}\boldsymbol{\Phi}_\xi\boldsymbol{\Gamma}' + \boldsymbol{\Psi}) (\boldsymbol{I} - \boldsymbol{B})^{-1'} \boldsymbol{\Lambda}_x' + \boldsymbol{\Theta}_\delta \tag{5.51}$$

Finally, the variance covariance matrix $\boldsymbol{\Sigma}_{xy}$ for the relationship of manifest latent and observed variables is derived through equations 5.35, 5.40, 5.41:

$$\begin{aligned}
\boldsymbol{\Sigma}_{xy} &= E[\boldsymbol{x}\boldsymbol{y}'] && (5.52)\\
&= E\left[(\boldsymbol{\Lambda}_x\boldsymbol{\xi} + \boldsymbol{\delta})(\boldsymbol{\Lambda}_y\boldsymbol{\eta} + \boldsymbol{\epsilon})'\right] && (5.53)\\
&= E\left[(\boldsymbol{\Lambda}_x\boldsymbol{\xi} + \boldsymbol{\delta})\left(\boldsymbol{\eta}'\boldsymbol{\Lambda}_y' + \boldsymbol{\epsilon}'\right)\right] && (5.54)\\
&= E\left[\boldsymbol{\Lambda}_x\boldsymbol{\xi}\boldsymbol{\eta}'\boldsymbol{\Lambda}_y' + \boldsymbol{\Lambda}_x\boldsymbol{\xi}\boldsymbol{\epsilon}' + \boldsymbol{\delta}\boldsymbol{\eta}'\boldsymbol{\Lambda}_y' + \boldsymbol{\delta}\boldsymbol{\epsilon}'\right] && (5.55)
\end{aligned}$$

Equation 5.55 can be further simplified when taking the assumption that the residuals $\boldsymbol{\epsilon}$ and $\boldsymbol{\delta}$ are neither correlated nor correlation of these residuals with the respective latent variables $\boldsymbol{\xi}$ and $\boldsymbol{\eta}$ exists:

$$\boldsymbol{\Sigma}_{xy} = \boldsymbol{\Lambda}_x E[\boldsymbol{\xi}\boldsymbol{\eta}'] \boldsymbol{\Lambda}_y' \tag{5.56}$$

The resulting equation 5.56 can be further simplified through subsequent substitution of $\boldsymbol{\eta}$ by the relationship in equation 5.45:

$$\begin{aligned}
\boldsymbol{\Sigma}_{xy} &= \boldsymbol{\Lambda}_x E\left[\boldsymbol{\xi}\left(\left(\boldsymbol{I}-\boldsymbol{B}\right)^{-1}\left(\boldsymbol{\Gamma}\boldsymbol{\xi}+\boldsymbol{\zeta}\right)\right)'\right]\boldsymbol{\Lambda}_y' && (5.57)\\
&= \boldsymbol{\Lambda}_x E\left[\boldsymbol{\xi}\left(\left(\boldsymbol{I}-\boldsymbol{B}\right)^{-1}\boldsymbol{\Gamma}\boldsymbol{\xi}+\left(\boldsymbol{I}-\boldsymbol{B}\right)^{-1}\boldsymbol{\zeta}\right)'\right]\boldsymbol{\Lambda}_y' && (5.58)\\
&= \boldsymbol{\Lambda}_x E\left[\boldsymbol{\xi}\left(\boldsymbol{\xi}'\boldsymbol{\Gamma}'\left(\boldsymbol{I}-\boldsymbol{B}\right)^{-1'}+\boldsymbol{\zeta}'\left(\boldsymbol{I}-\boldsymbol{B}\right)^{-1'}\right)\right]\boldsymbol{\Lambda}_y' && (5.59)
\end{aligned}$$

Under the assumption that the residuals $\boldsymbol{\zeta}$ are not correlated with the exogenous latent variables $\boldsymbol{\xi}$ equation 5.59 the final equation for $\boldsymbol{\Sigma}_{xy}$ is obtained:

$$\begin{aligned}
\boldsymbol{\Sigma}_{xy} &= \boldsymbol{\Lambda}_x E\left[\boldsymbol{\xi}\boldsymbol{\xi}'\boldsymbol{\Gamma}'\left(\boldsymbol{I}-\boldsymbol{B}\right)^{-1'}\right]\boldsymbol{\Lambda}_y' && (5.60)\\
&= \boldsymbol{\Lambda}_x\boldsymbol{\Phi}_\xi\boldsymbol{\Gamma}'\left(\boldsymbol{I}-\boldsymbol{B}\right)^{-1'}\boldsymbol{\Lambda}_y' && (5.61)
\end{aligned}$$

Equations 5.43, 5.51 and 5.61 represent the *fundamental theorem of the structural equation model*. The variance covariance matrix $\boldsymbol{\Sigma}$ of all manifest variables is expressed through these equations as a function of the model parameters and reproduce $\boldsymbol{\Sigma}$:

$$\boldsymbol{\Sigma} = \left[\begin{array}{c|c} \boldsymbol{\Sigma}_x & \boldsymbol{\Sigma}_{xy} \\ \hline \boldsymbol{\Sigma}_{xy} & \boldsymbol{\Sigma}_y \end{array}\right] \tag{5.62}$$

A perfect replication of the variance-covariance matrix $\boldsymbol{\Sigma}$ of the manifest variables is not possible since it is unknown. For this reason, the sample variance-covariance matrix $\boldsymbol{S}$ is matched to the model-implied estimated variance covariance matrix $\hat{\boldsymbol{\Sigma}}$ through the minimisation of a discrepancy function. The following discrepancy function is implemented in maximum likelihood based estimation methods:

$$l\left[\hat{\boldsymbol{\Sigma}}(\boldsymbol{\theta}), \boldsymbol{S}\right] = \log\left|\hat{\boldsymbol{\Sigma}}(\boldsymbol{\theta})\right| + \operatorname{tr}(\boldsymbol{S}\hat{\boldsymbol{\Sigma}}(\boldsymbol{\theta})^{-1}) - \log\left|\boldsymbol{S}\right| - p \tag{5.63}$$

p represents the number of observed variables (variances/covariances). It is important to mention that maximum likelihood based estimation methods take specific assumptions about the distribution of the data. While taking these assumptions makes the estimation process more difficult, through distributional assumptions probabilistic inferences can be performed. Multinormality of the underlying data is the central distributional assumption

taken in maximum likelihood based approaches.

5.2.1.3 The analysis of mean structures in latent variable models with multiple groups

Further complexity is added to latent variable models when multiple groups are considered. Jöreskog et al. (1971) has developed the analytical foundation for the following analysis. The consideration of multiple groups not only involves an analysis of the variance-covariance matrix of a sample but also its mean structure. In such scenario several steps are required in order to ensure model validity across different groups. The following paragraphs cover the particularities of multiple group analysis.

Model estimation The analysis of multiple groups involves fitting a given model of simultaneous equations to all groups at once. While to model structurally is the same differences between groups may be included in the specification. The appropriateness of such specifications needs to be assessed at each stage. Related tests are performed by simultaneously fitting the individual models of the individual groups with shared constrains on the model parameters and minimising the weighted sum of all group fit functions across the m groups (Jöreskog et al. 1971):

$$l_{\text{multigroup}} = \sum_{g=1}^{m}(N_g - 1)\left[\log|\hat{\boldsymbol{\Sigma}}_g| + \text{tr}(\boldsymbol{S}_g\hat{\boldsymbol{\Sigma}}_g^{-1}) - \log|\boldsymbol{S}_g| - p_g\right] \tag{5.64}$$

Equation 5.64 indicates the weighted discrepancy function across all groups with a group sample size of N_g, where g indicates the index of each group.

Mean structures As it has been implicitly mentioned in the previous paragraphs, intercepts (and means), may be introduced to the simultaneous equation model. When investigating multiple groups this is important as not only the effect of the of the variables may differ among groups, but also their absolute value among the different samples. Based on equations 5.40 and 5.41 it can be established that (Bentler and Yuan 2000, Jöreskog

et al. 1971)

$$\boldsymbol{x} = \boldsymbol{a}_x + \boldsymbol{\Lambda}_x \boldsymbol{\xi}^* + \boldsymbol{\delta} \tag{5.65}$$

$$\boldsymbol{y} = \boldsymbol{a}_y + \boldsymbol{\Lambda}_y \boldsymbol{\eta}^* + \boldsymbol{\epsilon} \tag{5.66}$$

where $\boldsymbol{a}$ is an intercept vector for the indicators of the endogenous and exogenous variables. It is further assumed that the latent variables can also be expressed trough a mean vector and a random vector, which expresses the deviation from this mean $E[\boldsymbol{\xi}] = E[\boldsymbol{\eta}] = \mathbf{0}$ (Bentler 2006, 204) as:

$$\boldsymbol{\xi}^* = \boldsymbol{\mu}_\xi + \boldsymbol{\xi} \tag{5.67}$$

$$\boldsymbol{\eta}^* = \boldsymbol{\mu}_\eta + \boldsymbol{\eta} \tag{5.68}$$

The intercept vector $\boldsymbol{\mu}$ in equations 5.67 and 5.68 represents the group means of the latent variable. When estimating the model, particularly when testing for invariance, at least for one group an intercept vector has to be constrained to a pre-determined value, such as for the first group $\boldsymbol{a}_{x;1} = \boldsymbol{a}_{y;1} = \boldsymbol{\mu}_{\eta;1} = \boldsymbol{\mu}_{\xi;1} = \mathbf{0}$, which then serves as reference for the other groups. It is important to understand the relationship between these variables as it implies that a comparison of the latent means among groups can only be meaningful when factor loadings $\boldsymbol{\Lambda}$ and intercepts of indicators $\boldsymbol{a}$ are found to be invariant between groups. For this reason, the following paragraph briefly introduces the different concepts of measurement invariance.

Measurement invariance When assessing the mean structures between a given set of groups it has to be ensured that the measurement model fits well in any of the given groups and the manifest variables measure the same latent variables, which is called measurement invariance. Different concepts of invariance exist. The first and least restrictive is *configural invariance*. This type of invariance only requires the same factor structure across all individual groups. However, this type of invariance does not guarantee that the latent variables measure the latent variables in the same way across groups.
A first more restrictive constraint on the measurement model is the assumption of equal factor loadings $\boldsymbol{\Lambda}$ across groups (*weak invariance*). Weak invariance suggests that the effect of a latent variable on the manifest variables is the same between subjects of differ-

ent groups. However, this step does not ensure that the expected value of the manifest variables is the same. To test for the same expected value of the manifest variables across groups, intercepts $\boldsymbol{a}$ of the manifest variables need to be constrained together with loadings loadings (*strong invariance*). Strong invariance hence allows for the comparisons of the latent variables between the groups. Finally, *strict invariance* adds the constraint that also error variances $\boldsymbol{\delta}$ and $\boldsymbol{\epsilon}$ of the indicator variables are the same between groups. This further constraint extends that the use of the scale by respondents is the same between the groups not only in the overall mean, but also with respect to the associated standard error (within group variability). Establishing invariance of the measurements is important when aiming to draw comparisons for a model between groups. Sometimes, general invariance of the measurements can however not be obtained. In such cases *partial invariance* can be obtained by removing equality constraints for individual variables in the model.

The evaluation of invariance can be performed based on different approaches. Since the assessment of invariance involves gradually more restrictive nested models, likelihood ratio tests are appropriate. However, since this test is based on a χ^2 distributed statistic, which will be discussed in section 5.2.2.2, it is sensitive to sample size. Hence, in large samples the test statistic will show statistic significance, despite being of little practical impact. For this reason, research follows a further evaluation criteria, which is commonly chosen the comparative fit index (CFI, cp. section 5.2.2.3). According to Cheung and Rensvold (2002), a change in CFI of 0.01 or less between two models, should not lead to reject the hypothesis of measurement invariance when gradually testing each step of invariance. Due to the large sample in each group, this study uses the change in CFI as decision criterion.

Comparing latent means between groups The comparison of latent means has several advantages compared to more traditional approaches that use observed means to compare between group differences. By using the latent variable approach described above, measurement error is accounted for in each indicator variable. Further, different factor loadings for the manifest variables are considered when deriving the latent variables. For these reasons latent mean analysis adds higher construct reliability and higher statistical power compared to the traditional method of aggregating individual indicators of a factor. Hancock (2001) discusses the comparison of mean differences for latent vari-

ables. The author proposes the use of a previously introduced index of effect sizes. Cohen (1988) has defined this index for a comparison of two latent variable means μ_1 and μ_2 as

$$d = \frac{|\mu_1 - \mu_2|}{S} \tag{5.69}$$

where S is defined as the square root of the pooled within-groups variance estimate

$$S = \sqrt{\frac{(N_1 - 1)S_1^2 + (N_2 - 1)S_2^2}{N_1 + N_2 - 2}} \tag{5.70}$$

Cohen (1988, 1992) considers d-values of .2, .5 and .8 indications of small, medium and large effect sizes. In a confirmatory factor analysis environment the intercept of a latent variable represents its mean. However, it is important to note that the latent mean μ of a variable can be substantially different from its intercept when structural relationships between latent variables exist. For this reason, when determining the means of endogenous variables of a structural model, also the intercept terms and path coefficients of the exogenous variables need to be taken into consideration in the computational process (Kline 2015, 420).

Comparing path coefficients between groups The comparison of path coefficients between groups bears a particularity, which requires brief explanation. When interpreting path coefficients in latent variable models it is often advised to prefer standardised coefficients over unstandardised ones. It is commonly argued that the use of standardised coefficients is favoured due to the fact that particularly latent variables are measured on an arbitrary scale, which does not possess the ability of direct interpretation. Some researchers argue that a standardised coefficient b^* facilitates the interpretation of such data by expressing a change in standard deviations of two variables x and y:

$$b^* = b\frac{\sigma_x}{\sigma_y} \tag{5.71}$$

However, Willett et al. (1998) warn, that such standardisation may lead researches to misleading conclusions. Even more, such risk exists in the specific context of multiple group analysis (Kline 2015, 395). It may be remembered that constraints when testing for invariance are imposed on the measurement model. Strict invariance however still allows

for variances of the latent variables to differ between groups. For this reason, a comparison of standardised coefficients may lead to different conclusions. It is however important to keep in mind that under the assumption of strict invariance variables are measured using the same measurement model across groups and hence are measured on the same arbitrary scale, which makes path coefficients directly comparable between the individual groups. Also Beaujean advocates the use of unstandardised path coefficients "for the same variable relationships across samples" (Beaujean 2014, 26). For these reasons, unstandardised path coefficients are used in this study to perform comparisons between groups. As the marker variable approach is used and all marker variables are measured on a 7-point Likert scale, the latent variable follows the same metric, which is a preferential characteristic that fosters comparability in this given research scenario (Mehmetoglu and Jakobsen 2016, 301).

MIMIC modelling An alternative to the above presented way of investigating multiple groups is *multiple indicator, multiple cause* (MIMIC) modelling. In this type of modelling an observed covariate is linked to a latent variable in the structural model and itself assumed free of measurement error. Such covariates are commonly demographic characteristics, such as gender. However, in the case of this research the covariate of foremost interest is whether a business is a family winery or a corporate winery. In such case the covariate is represented by a dichotomous variable (cp. *family firm status* covariate in figure 4.3). In case of strict MIMIC modelling only a single covariance matrix is estimated. If the direct effect of a covariate on a latent variable is found significant, then the assumption of structural invariance of the latent variable for a given covariate can be rejected. However, the approach of MIMIC modelling falls short testing for measurement invariance across groups, while its principal advantage is that sample size requirements are smaller compared to the analysis of mean structures.

5.2.2 Model evaluation

5.2.2.1 Multinormality

Covariance-based structural equation modelling relies upon the assumption that observations are drawn from a multivariate normal population. As long as these conditions are met, a maximum likelihood estimator is an unbiased asymptotically efficient estimator.

However, if the sample or the population deviates from these assumptions of normality effects on the model estimation are observed. It is known that estimators themselves are unlikely to be biased, however the standard errors and test statistics are affected. Effects of non-normality of the data are resulting in a tendency to underestimate the standard error of a model and lead to an overestimation of the likelihood χ^2 statistic (Kaplan 2008, 86). Significance tests for the assumption of multinormality have been proposed earlier by Mardia (1970). However, Kline (2015, 74) advises to interpret test results with caution since test sensitivity depends on the sample size. Hence, tests may be found significant for even slight deviations from multinormality in large samples and fail to detect non-normality in small samples. Mardia (1970, 1974) introduces multivariate measures of skewness $b_{1,p}$ and kurtosis $b_{2,p}$:

$$b_{1,p} = \frac{1}{n^2} \sum_{i=1}^{n} \sum_{j=1}^{n} \left[(\boldsymbol{X}_i - \bar{\boldsymbol{X}})' \boldsymbol{S}^{-1} (\boldsymbol{X}_j - \bar{\boldsymbol{X}}) \right]^3 \tag{5.72}$$

$$b_{2,p} = \frac{1}{n} \sum_{i=1}^{n} \left[(\boldsymbol{X_i} - \bar{\boldsymbol{X}})' \boldsymbol{S}^{-1} (\boldsymbol{X_i} - \bar{\boldsymbol{X}}) \right]^2 \tag{5.73}$$

$\boldsymbol{X}_i$ and $\boldsymbol{X}_j$ are independent and identical copies of a random p-vector $\boldsymbol{X}$ with mean $\bar{\boldsymbol{X}}$ and sample covariance matrix $\boldsymbol{S}$. Mardia proposes the following test statistics for skewness $z_{1,p}$ and kurtosis $z_{2,p}$:

$$z_{1,p} = \frac{n}{6} b_{1,p} \sim \chi^2 \left(\frac{p(p+1)(p+2)}{6} \right) \tag{5.74}$$

$$z_{2,p} = \frac{b_{2,p} - p(p+2)(n-1)/(n+1)}{\sqrt{8p(p+2)/n}} \sim N(0,1) \tag{5.75}$$

It can be inferred that the underlying joint distribution is not multinormal if at least one of the values of formulae 5.74 or 5.75 exceeds the critical threshold (depending on the significance level chosen).

Authors in the field suggest that data exhibiting $|b_{1,1}|$ of 0 are considered perfectly normal, values of less than 3 can be considered as moderate departure from normality, while values exceeding 3 can be considered severely skewed. Regarding $|b_{2,1}|$ less consensus exists, but a conservative threshold of 7 can be assumed for moderate kurtosis (Nevitt and Hancock 2000), while values that exceed this threshold are indicating more serious

kurtosis, however, commonly only values above 20 are considered an indication severe kurtosis (Kline 2015, 77). While statistical tests may be too sensitive for large n and p (Cain et al. 2017) , an overall reporting of indicators of skewness and kurtosis appears appropriate. Cain et al. have pointed out that non-multinormality of data needs to be taken into account in all following stages of the research since it is related to inflated type I error rates of statistical tests.

5.2.2.2 χ^2 test of fit

In his seminal work Jöreskog (1969) has described the use of a χ^2 test statistic when evaluating confirmatory factor analysis models. Bollen (1989) presents a generalised form that can be applied to any structural equation model (Mulaik 2009). This test is similar to the approach taken when evaluating the model fit in logistic regression models (cp. section 5.1.1). Similar to equation 5.10 it is assumed that

$$\mathrm{LR} = -2 \log \frac{L(\hat{\omega})}{L(\hat{\Omega})} \tag{5.76}$$

with

$$L(\hat{\omega}) = -\frac{(N-1)}{2} \left[\log |\hat{\boldsymbol{\Sigma}}_0| + \mathrm{tr} \left(\hat{\boldsymbol{\Sigma}}_0^{-1} \boldsymbol{S} \right) \right] \tag{5.77}$$

$$L(\hat{\Omega}) = -\frac{(N-1)}{2} \left[\log |\boldsymbol{S}| + \mathrm{tr} \left(\boldsymbol{S}^{-1} \boldsymbol{S} \right) \right] \tag{5.78}$$

$$\tag{5.79}$$

It can be shown that simplification of this results in

$$\mathrm{LR} = (N-1) l \sim \chi^2 \left(1 - \alpha, \frac{p(p+1)}{2} \right) \tag{5.80}$$

where l is the minimum value of the log likelihood fit function stated in equation 5.63 and N is the sample size. This estimator is however only efficient as long as the assumption of multinormality holds, as otherwise test scores are inflated. An adjusted version of this test statistic that is robust if the assumption of multinormality of data is violated has been developed by Satorra and Bentler (1994). This approach employs a correction based on the average multivariate kurtosis. The authors introduce a correction parameter $\hat{c}$ and

define the robust scaled test statistic as[11]:

$$\mathrm{LR}_{\mathrm{robust}} = \frac{\mathrm{LR}}{\hat{c}} \tag{5.81}$$

Despite hypothesis testing is an integral part of assessing model fit, Bollen and Long argue that specifically the chi-square test statistic should not be the sole basis of this evaluation. This reasoning is motivated from the assumption that "the hypothesised model leads to an implied covariance matrix of the observed variables that exactly reproduces the covariance matrix of the observed variables in the population" (Bollen and Long 1992, 127). Subsequently no approximation, which however is a fundamental principle of modelling, is allowed. The authors further argue that tests with excessive statistical power can lead to the rejection of good models.

Multiple groups In order to obtain a test statistic for assessing multiple groups, Jöreskog et al. (1971) indicate that $l_{\mathrm{multigroup}}$ in equation 5.64 in large samples can be approximated by a χ^2 distribution of:

$$l_{\mathrm{multigroup}} \sim \chi^2 \left(1 - \alpha, \sum_{g=1}^{m} \frac{p(p+1)}{2} - t\right) \tag{5.82}$$

where t is the total number of estimated independent model parameters.

5.2.2.3 Fit indices

Several indices exist that provide an indication of the fit of the structural equation model. Such indexes are usually defined on a scale from zero, indicating a lack of model fit, to one, indicating perfect fit of the model. However, such indices are no statistical tests and do not follow a given probability distribution. For this reason, simulation studies, as well as rules of thumb need to be applied in order to decide whether a model sufficiently fits the data. Since many different indices exist, an extensive discussion of all indexes may be found in Beaujean (2014) and Mulaik (2009). Only a brief presentation of the most fundamental indices employed in this study is given in the following.

[11] In their seminal paper Satorra and Bentler (1994) describe how $\hat{c}$ derived. In order to maintain succinctness of the manuscript the analytical derivation of $\hat{c}$ may not be presented at this point.

Goodness of fit index The Goodness of Fit Index (GFI) is an absolute fit index, which derives from the coefficient of determination in regression models. In this way the GFI expresses which proportion of the variance covariance matrix $\boldsymbol{S}$ is explained by the model implied fitted variance covariance matrix $\hat{\boldsymbol{\Sigma}}$.

$$\mathrm{GFI} = 1 - \frac{\mathrm{tr}\left(\left[\hat{\boldsymbol{\Sigma}}^{-1}\left(\boldsymbol{S} - \hat{\boldsymbol{\Sigma}}\right)\right]^2\right)}{\mathrm{tr}\left[\left(\hat{\boldsymbol{\Sigma}}^{-1}\boldsymbol{S}\right)^2\right]} \tag{5.83}$$

Although the GFI by its analytic definition does not depend on sample size, Monte Carlo studies have shown that GFI tend to increase with sample size N (Marsh et al. 1988). A further criticism is that this index is also influenced by the number of exogenous latent variables n and degrees of freedom df in the model. For this reason, an adjustment is required to control for parsimony. The Adjusted Goodness of Fit Index is defined as:

$$\mathrm{AGFI} = 1 - \frac{n(n+1)}{2\mathrm{df}}\left(1 - \mathrm{GFI}\right) \tag{5.84}$$

Comparative fit index The Comparative Fit Index (CFI) derives from the maximum likelihood fit function, which has been described earlier in equation 5.63. This function is the basis of the χ^2 test statistic presented in equation 5.80. The index represents a ratio of the actual model fit, given by its χ^2 statistic of a model with a variance covariance matrix $\hat{\boldsymbol{\Sigma}}$ and a model with the worst fit possible, represented by a variance covariance matrix $\boldsymbol{\Sigma}_{\text{null}}$. In this case a model variance covariance matrix that only consists of the variances of the observed variables $\boldsymbol{\Sigma}_{\text{null}} = \mathrm{diag}\left(\boldsymbol{S}\right)$ is assumed. Such model implied covariance matrix assumes absolute independence of all observed variables and represents the worst possible fit. Hence the respective χ^2 statistics derive from equation 5.80, while the value for the null model is the highest value possible. The ratio of these statistics is the basis of the CFI. However, further adjustments for the degrees of freedom are required to center the individual measures by their expected means. The following measures of fit result

from these assumptions (Bentler 1990):

$$\mathrm{FI} = 1 - \frac{\mathrm{LR}\left(\hat{\boldsymbol{\Sigma}}\right) - \mathrm{df}}{\mathrm{LR}\left(\boldsymbol{\Sigma}_{\mathrm{null}}\right) - \mathrm{df}_{\mathrm{null}}} \tag{5.85}$$

$$\mathrm{CFI} = \begin{cases} 1 & \text{for FI} > 1 \\ \mathrm{FI} & \text{for } 0 \leq \mathrm{FI} \leq 1 \\ 0 & \text{for FI} < 0 \end{cases} \tag{5.86}$$

Since this index relies on the χ^2 statistic, the assumption of multinormality is taken. Violation of this assumption, leads to an inflation of the test statistic in equation 5.80. For this reason, Brosseau-Liard and Savalei (2014) introduce an adjustment for these indices based on the earlier work of Satorra and Bentler (1994):

$$\mathrm{FI}_{\mathrm{robust}} = 1 - \frac{\mathrm{LR}\left(\hat{\boldsymbol{\Sigma}}\right) - \hat{c}\ \mathrm{df}}{\mathrm{LR}\left(\boldsymbol{\Sigma}_{\mathrm{null}}\right) - \hat{c}_{\mathrm{null}}\mathrm{df}_{\mathrm{null}}} \tag{5.87}$$

The parameter estimates $\hat{c}$ and $\hat{c}_{\mathrm{null}}$ represent the Satorra and Bentler (1994) sample scaling constants for the hypothesised and the baseline models.

Root mean squared error of approximation Steiger and Lind (1980) have proposed a measure called the Root Mean Squared Error of Approximation (RMSEA)[12]. The RMSEA for a maximum likelihood fit function l is defined for the true population covariance matrix $\boldsymbol{\Sigma}^*$ and the proposed covariance matrix $\boldsymbol{\Sigma}$ as (Brosseau-Liard et al. 2012):

$$\mathrm{RMSEA} = \sqrt{\frac{l\left(\boldsymbol{\Sigma}^*; \boldsymbol{\Sigma}\right)}{\mathrm{df}}} \tag{5.88}$$

Mulaik (2009, 320) shows that such discrepancy function is biased when using the observed sample variance covariance matrix $\boldsymbol{S}$ and the estimated variance covariance matrix $\hat{\boldsymbol{\Sigma}}$ and has an expectation of

$$E\left[l\left(\hat{\boldsymbol{\Sigma}}; \boldsymbol{S}\right)\right] = l\left(\boldsymbol{\Sigma}^*; \boldsymbol{\Sigma}\right) + \frac{\mathrm{df}}{(N-1)} \tag{5.89}$$

[12] Beaujean (2014) calls this measurement Root Mean Square Error of Approximation, while Mulaik (2009) has chosen the name stated in this work.

Hence the sample-implied RMSEA can be obtained by substituting $l\left(\boldsymbol{\Sigma}^{*};\boldsymbol{\Sigma}\right)$ in equation 5.88 by the expression in equation 5.89

$$\text{RMSEA} = \sqrt{\frac{l\left(\hat{\boldsymbol{\Sigma}};\boldsymbol{S}\right) - \frac{\text{df}}{(N-1)}}{\text{df}}} \tag{5.90}$$

$$= \sqrt{\frac{l\left(\hat{\boldsymbol{\Sigma}};\boldsymbol{S}\right)(N-1) - \text{df}}{(N-1)\,\text{df}}} \tag{5.91}$$

In equation 5.91 it can be seen that the term can be further simplified by considering the definition of the test statistic, which has been introduced in equation 5.80:

$$\text{RMSEA} = \sqrt{\frac{\text{LR}\left(\hat{\boldsymbol{\Sigma}}\right) - \text{df}}{(N-1)\text{df}}} \tag{5.92}$$

As it can be seen above the RMSEA is dependent on the χ^2 distributed test statistic presented in equation 5.80. In case the assumption on multinormality is violated, Li and Bentler (2006) have introduced a robust of maximum likelihood RMSEA, which correct for multivariate kurtosis of the data:

$$\text{RMSEA}_{\text{robust}} = \sqrt{\frac{\text{LR}\left(\hat{\boldsymbol{\Sigma}}\right) - \hat{c}\,\text{df}}{(N-1)\text{df}}} \tag{5.93}$$

The robustness of the properties of this indicator has been tested in various numerical simulations by Brosseau-Liard et al. (2012).

5.3 Research question 3

The third research question is answered by identifying demographic variables that condition the choice behaviour of individuals in the sample. Detecting differences across population subgroups and correlating these differences to demographic variables can be performed using latent class models.

5.3.1 Logistic models with latent classes

Latent class models can be considered a special case of mixture models (cp. section 5.1.2) where a discrete distribution of $f(\boldsymbol{\beta}|\boldsymbol{\theta})$ is assumed in equation 5.15. It is assumed that the population can be divided into C subgroups for which a distinctive parameter vector $\boldsymbol{\beta}_c$ exists. The parameter vector $\boldsymbol{\beta}_c$ emanates from the group of possible parameter vectors of the classes. The density function $f(\boldsymbol{\beta}_c)$ takes the following discrete values, which represent the share each class c represents within the sample (Train 2009):

$$f(\boldsymbol{\beta}_c) = \begin{cases} s_1 & \text{if } \boldsymbol{\beta}_n = \boldsymbol{\beta}_1 \\ s_2 & \text{if } \boldsymbol{\beta}_n = \boldsymbol{\beta}_2 \\ \vdots & \\ s_C & \text{if } \boldsymbol{\beta}_n = \boldsymbol{\beta}_C \end{cases} \tag{5.94}$$

Using this definition it must hold that $\sum_i^C s_i = 1$ in order to obtain an interpretation of s_c as probability of membership in class c. Following the formulation of the logistic model for the given case of two choice alternatives, equation 5.6 can be adapted to the specification introduced above. However, in this regard the mixing distribution of $\boldsymbol{\beta}_c$ has to be considered. In this regard the approximation of the discrete mixing distribution, which has been presented in equation 5.18 can be considered the analytical solution of the discrete case. However, instead of assuming equal weights, the weights of class membership probability follow equation 5.94:

$$P(i|\{1,2\};\boldsymbol{x},\boldsymbol{\beta}_c) = \sum_c s_c \frac{e^{V_i(\boldsymbol{x},\boldsymbol{\beta}_c)}}{e^{V_1(\boldsymbol{x},\boldsymbol{\beta}_c)} + e^{V_2(\boldsymbol{x},\boldsymbol{\beta}_c)}} \tag{5.95}$$

As it is shown in equation 5.20 when considering multiple observations per respondent the mixing distribution is applied at the level of the joint probability for all k choices. The likelihood function for an individual m following the definition in equation 5.8 can hence be defined on the basis of 5.95:

$$L_m(\boldsymbol{\beta}) = \sum_c s_c \prod_k \frac{e^{V_i(\boldsymbol{x},\boldsymbol{\beta}_c)}}{e^{V_1(\boldsymbol{x},\boldsymbol{\beta}_c)} + e^{V_2(\boldsymbol{x},\boldsymbol{\beta}_c)}} \tag{5.96}$$

The likelihood function for the sample can hence be expressed as:

$$L(\boldsymbol{\beta}) = \prod_m L_m(\boldsymbol{\beta}) \tag{5.97}$$

The final likelihood function for maximisation can be obtained as the sum of the logarithmic likelihood function[13] (equation 5.8) of each respondent m:

$$l(\boldsymbol{\beta}) = \sum_m \log \sum_c s_c \prod_k \frac{e^{V_i(\boldsymbol{x},\boldsymbol{\beta}_c)}}{e^{V_1(\boldsymbol{x},\boldsymbol{\beta}_c)} + e^{V_2(\boldsymbol{x},\boldsymbol{\beta}_c)}} \tag{5.98}$$

5.3.2 Class membership function

The mass probabilities s_c of class membership may depend upon characteristics of the sample, such as a vector of demographic indicators $\boldsymbol{Z}_m$ that are specific to an individual m. The knowledge of these relationships can provide important information that help to identify the factors that cause sample heterogeneity. For this reason a class membership function F can be defined:

$$F_{mc} = f(\boldsymbol{Z}_m, \boldsymbol{\gamma}_c) + \epsilon_{mc} \tag{5.99}$$

The probability of an individual m to belong to class c can then be expressed as[14]:

$$P_m(c) = \frac{e^{f(\boldsymbol{Z}_m,\boldsymbol{\gamma}_c)}}{\sum_c e^{f(\boldsymbol{Z}_m,\boldsymbol{\gamma}_c)}} \tag{5.100}$$

The probability of class membership in equation 5.100 can hence substitute the mass probability s_c in equation 5.98 and yields the target function for maximisation:

$$l(\boldsymbol{\beta}) = \sum_m \log \sum_c P_m(c) \prod_k \frac{e^{V_i(\boldsymbol{x},\boldsymbol{\beta}_c)}}{e^{V_1(\boldsymbol{x},\boldsymbol{\beta}_c)} + e^{V_2(\boldsymbol{x},\boldsymbol{\beta}_c)}} \tag{5.101}$$

[13] This step sums up applying a logarithmic monotonous transformation to the joint likelihood function first and then rewriting the equation as the sum of m log likelihood functions.

[14] It is expected that ϵ_{mc} is uncorrelated with other error terms and has zero expectation value.

The class membership for a two class model in this study is defined as follows:

$$\begin{aligned} f(\boldsymbol{Z}_m, \boldsymbol{\gamma}_1) &= \gamma_{0;1} + \gamma_{income;1}\, Z_{income;m} + \gamma_{interest;1}\, Z_{interest;m} + \\ &\quad \gamma_{male;1}\, Z_{male;m} + \gamma_{age;1}\, Z_{age_m} + \gamma_{university;1}\, Z_{university_m} + \\ &\quad \gamma_{drinkingfrequency;1}\, Z_{drinkingfrequency;m} \end{aligned} \tag{5.102}$$

$$f(\boldsymbol{Z}_m, \boldsymbol{\gamma}_2) = 0 \tag{5.103}$$

Chapter 6

Results

This first section defines the framing and context of subsequent findings of the following analysis. First of all, the data reveal vast differences with respect to the places where consumers purchase wine. Marked differences do not only exist between countries, but also more importantly between family and corporate wineries. Figure 6.1 summarises the different points of purchase by firm type and country. In cases where points of purchase exhibit statistically significant differences between firm types, an indication of the percent share and the significance level[1] is given in the figure. It becomes obvious that particularly the cellar door is a central touchpoint for consumers when purchasing wine from family wineries, particularly in Italy and Australia. Especially in Italy, the majority of sales of wine from family wineries occurs through the cellar door. In Australia, family wineries still sell significantly more of their wine through the cellar door, but cellar door sales account

[1]Significance codes that apply in the following figures are *:$p < .05$,**:$p < .01$ and ***:$p < .001$.

Figure 6.1: Points of purchase

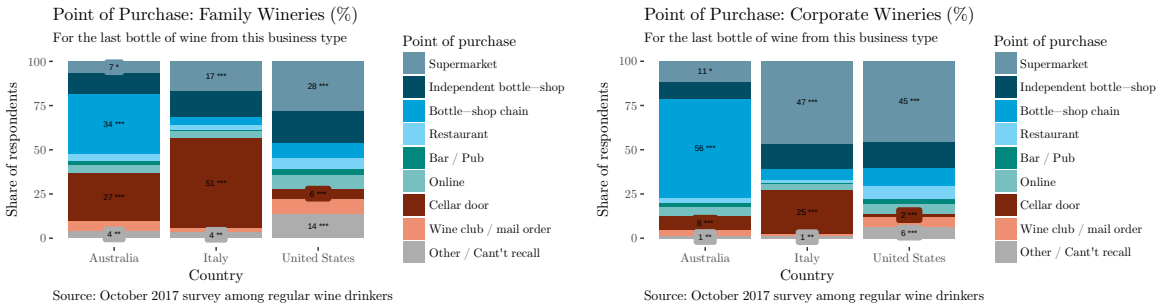
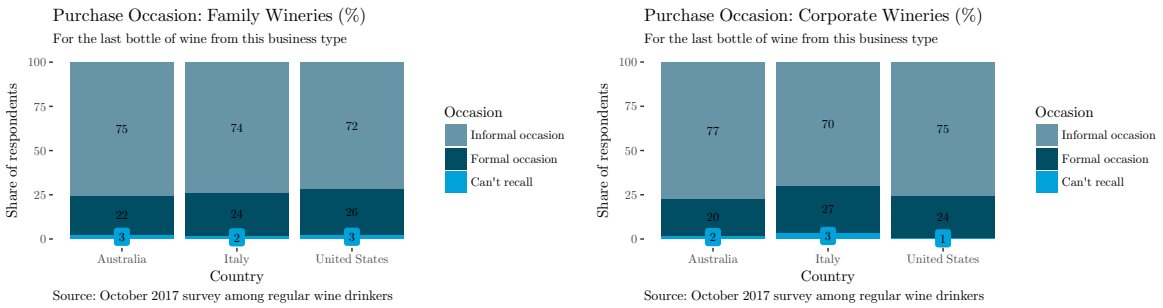


Figure 6.2: Purchase occasions



for only about 27 percent of total sales. However, bottle shop chains appear to substitute the missing part of cellar door sales compared to the situation in Italy. Consumers in the United States still purchase significantly more wine from family wineries through the cellar door than they buy from their corporate counterparts, but cellar door sales only account for about 6 percent of total sales. At the same time supermarkets represent the most important point of purchase in the US, both for family and corporate wineries. Across all three countries, significant differences between both firm types can be seen for this channel. Supermarkets and bottle shop sales[2] are an important distribution channel, especially for corporate wineries and account for 77, 67 and 70 percent of all sales of this type of company in Australia, Italy and the United States. Even for family firms, sales of these channels still account for more than half of all sales in Australia and the United States.

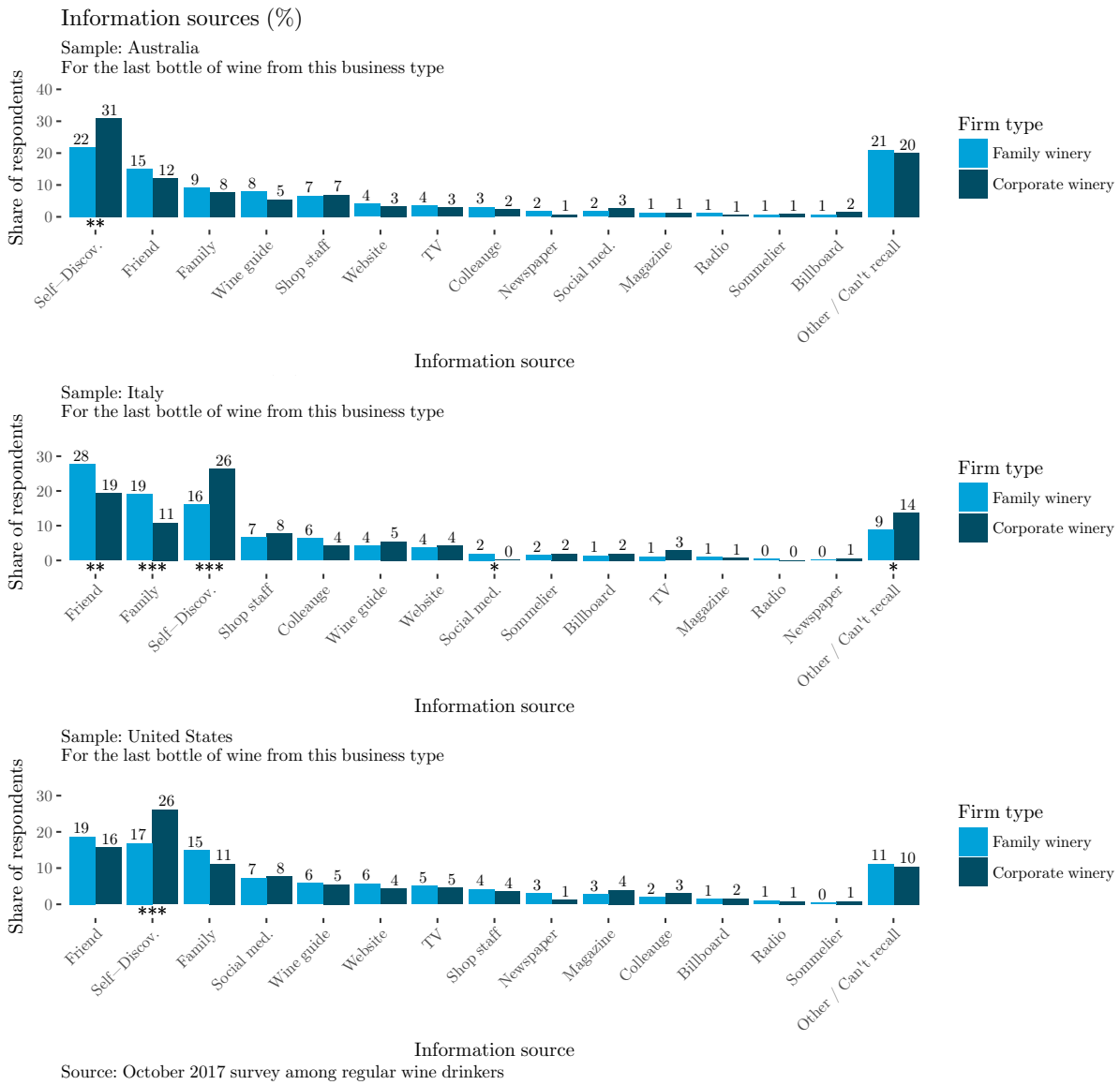
Figure 6.2 shows purchase occasions of wine by country and firm type. It is consistently found across all countries that wine is mainly consumed during informal occasions, while in about one of five occasions wine is consumed for a formal occasion. This vast homogeneity of wine consumption also exists when comparing family and corporate wineries.

Key information sources for wine purchases from family wineries and corporate wineries differ significantly. Word of mouth[3] and self-discovery of wines are key across all countries and consistently rank among the top three information sources (figure 6.3). However, individual ranks within this group of these top three information sources depend on the country. A pattern that characterises consumer behaviour in all three countries is the

[2]Due to the a ban of alcohol sales in supermarkets in many Australian states, this channel shows a lower representation in other countries, however bottle-shop chains are for this reason much more prevalent in Australia than in any other country.

[3]Friends and family are the key informants that are summarised as word of mouth in the following.

Figure 6.3: Information sources by country



Source: October 2017 survey among regular wine drinkers

significantly higher importance of self-discovery for corporate wineries, while playing a less pronounced role for family firms. In Italy, recommendations from friends and family members are significantly more important for wine purchases from family wineries than they are for corporate wineries and account for 47 percent of all purchases, while self discovery accounts for only 16 percent of wine purchases from family wineries in Italy. Word of mouth is also important for family firms in the United States where in about 34 percent of all purchases word of mouth is the key information source, compared to self-discovery which accounts for 17 percent of purchases from family firms. In Australia this pattern is the least pronounced, where wine from family businesses is purchased through word of mouth in 24 percent of all occasions, compared 22 percent of self-discovery. The data further shows friends to be more influential information sources than family members for any company type. The key information source for consumer wine purchases from corporate wineries across any country remains self-discovery during shopping in about 26-30 percent of purchases. A particularity can be seen in the United States, where social media, which can be classified as electronic word of mouth, ranks fourth among all information sources for any company type.

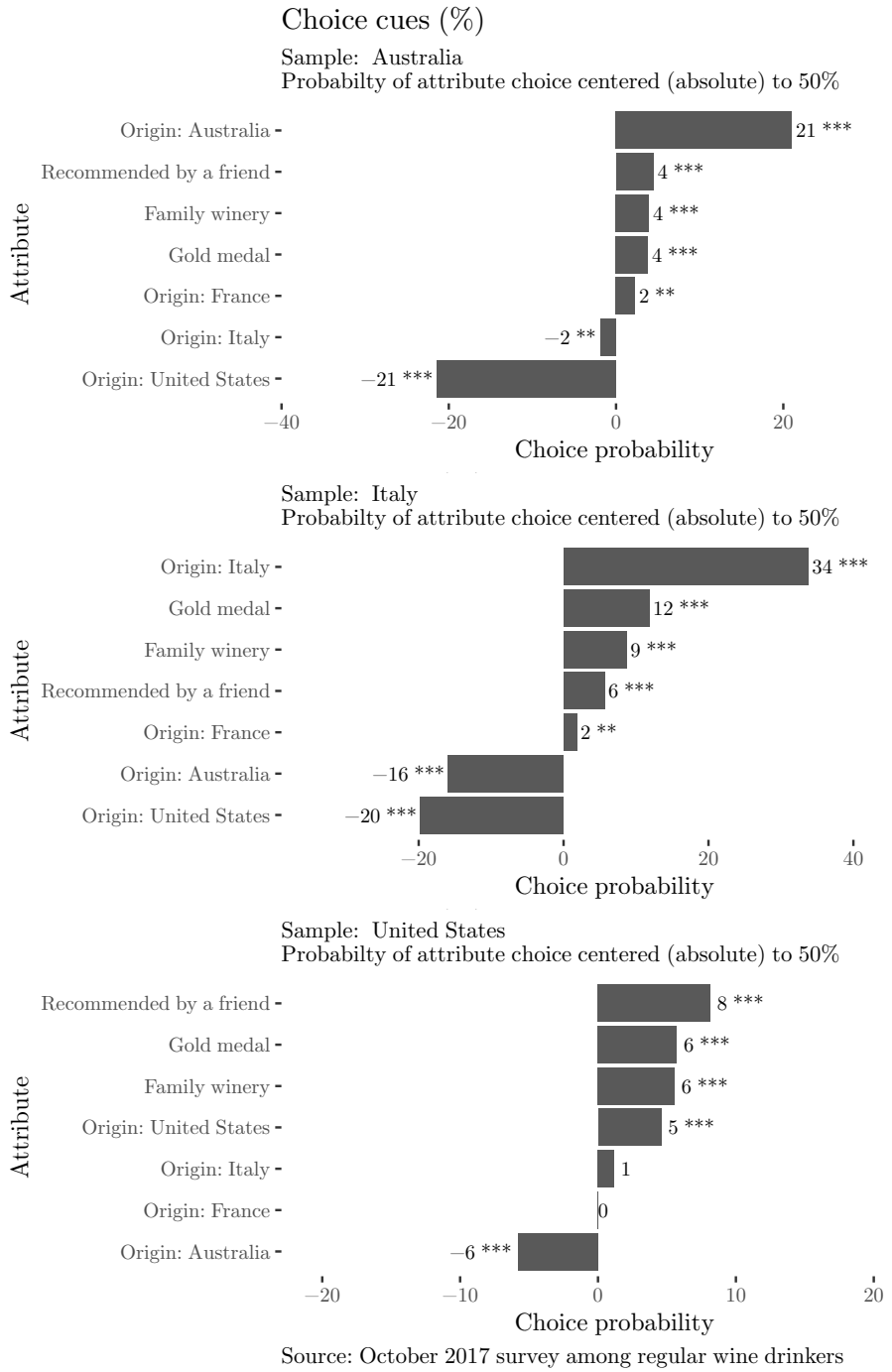
6.1 Research question 1

The analysis of the data to investigate research question 1 is performed in multiple steps. First, a univariate analysis of the data is performed, which is followed by a multivariate estimation of multiple logistic models using fixed and random effects.

6.1.1 Univariate results

The elaboration shown in figure 6.4 shows relative choice frequencies of the individual choice levels included in the experiment (cp. section 4.3). At first, the strong consumer preference of domestic wine origin in Australia and Italy becomes obvious. Australian respondents chose Australian wine in 71 percent of all choice situations, while among Italian respondents domestic wine was chosen in 84 percent of choice situations. US consumers chose domestically produced wine in 55 percent of shown choice situations. Recommendations by friends are a relevant choice cue in all countries and most important in the United States. With respect to consumer preference of countries of origin, it

Figure 6.4: Choice cues by country



Source: October 2017 survey among regular wine drinkers

becomes obvious that among Australian consumers wines from the United States are by far the least preferred and vice-versa. In these countries, Italy and France show a more balanced preference. In Australia, French wines are preferred over Italian wines, while in the US no preference of both countries exists. Among Italian consumers, a strong penalisation of both Australian (34 percent) and US (30 percent) wines is observed, while a preference of French wines prevails (52 percent). In Australia, recommendations shape the second most important choice cue (54 percent) while this cue ranks fourth in Italy (56 percent). However, recommendations by friends, awarded gold medals as well as the firm type (i.e. family winery or corporate winery) share about the same importance (54 percent) among Australian respondents. As it has already been stated, gold medals are another choice cue which exercises a positive effect on consumer choice. In Italy and the United States, gold medals are the second most important choice cue (62 and 56 percent, respectively), while they rank fourth in Australia (54 percent).
The family firm cue exhibits a significant positive influence on consumer behaviour across all three countries. The effect of this cue on consumer behaviour is least pronounced in Australia where consumers chose wine from family wineries in 54 percent of all choice situations. In Italy, the family winery attribute is the most important, which is shown by the fact that respondents chose wine from this type of company in 59 percent of all choice situations. US consumers take an intermediate position and chose wine from family wineries in 56 percent of all choice situations. These results indicate that in all countries firm type is a significant driver of consumer choice and effect size is ranging between the gold medals and recommendations attributes in all countries.

6.1.2 Multivariate results

6.1.2.1 Logistic models

Subsequent multivariate analysis is carried out in order to jointly analyse the relationships between the individual variables. Three different multinomial logistic models (cp. section 5.1.1) have been estimated and listed in appendix A.3. Results indicate that a highly significant relationship between the family firm attribute and consumer choice exists at a $p < .01$ significance level for all three different models across three countries. In four out of nine models an interaction between the family firm attribute and the price of a product

has been detected. However, three out of these four cases apply to consumers in Australia (twice at a $p < .05$ and once at a $p < .1$ significance level) and once to consumers in Italy ($p < .1$).

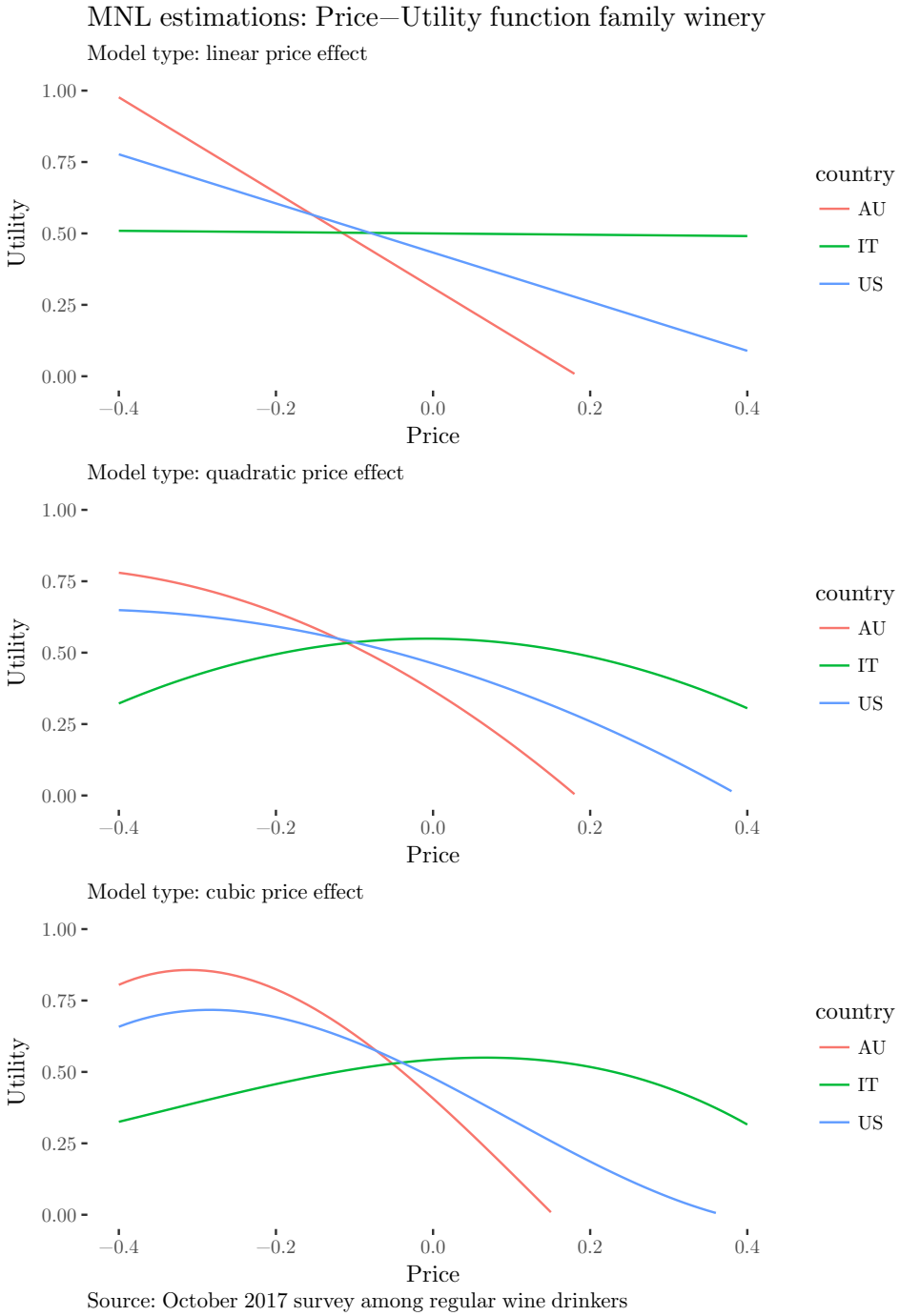
Based on the estimated coefficients for each of the nine models the utility function has been simulated for the price-utility relationship in presence of the family attribute. The results in figure 6.5 show that the model with linear price effect shows a negative price utility relationship across all three countries[4]. However, for Italy these results are the least clear in the linear model. The quadratic model shows a monotonous relationship for the price-utility function for Australia and the United States. Among the Italian sample no such monotonicity is found and utility peaks about the median value of price in the Italian sample. The monotonicity found in the quadratic model however changes in the cubic model and local maxima within the price range can also be identified for Australia and the United States as well. Likelihood ratio tests are conducted to compare model fit of the different specifications of the price-utility relationship. The summary of these tests (table 6.1) indicates that in any country the linear specification is outperformed by a higher order model. Particularly in Australia and the United States the extended model specified in equation 5.5 is preferred over the linear model (equation 5.2) at a five percent significance level. For the Italian dataset a quadratic model (equation 5.4) is preferred at a ten percent significance level over a linear model specification. These findings are consistent with the conclusions drawn when using the *Akaike Information Criterion (AIC)*. However, when using the *Bayesian Information Criterion (BIC)*, a linear model specification is consistently preferred across all countries (cp. table A.5). Since the different attempts to assess goodness of fit generate heterogeneous results, the three model specifications are investigated more closely.

6.1.2.2 Logistic mixture models

Further multivariate analysis has been performed using three different logistic mixture models per country in preference space (cp. section 5.1.2). Individual results of the estimation are listed in appendix A.4. Results indicate that a highly significant relationship between the family attribute and consumer choice exists at a $p < .01$ significance level for the three models in each of the three countries.

[4]Due to the fact that utility is not measured on an absolute scale, utilities cannot be compared based on absolute values or their slope across models or countries based on figure 6.5.

Figure 6.5: Price-Utility relationship for the logistic models



Source: October 2017 survey among regular wine drinkers

Table 6.1: MNL model comparison: likelihood ratio tests

	Model	Linear		Quadratic		Cubic	
	α	0.1	0.05	0.1	0.05	0.1	0.05
Country	Australia	A	A	B	B	**C**	**C**
	Italy	A	A	**B**	A	AB	A
	United States	A	A	B	A	**C**	**B**

Note: Familywise error controlled while performing multiple tests (Hommel 1988)

Table 6.2: MXL model comparison: likelihood ratio tests

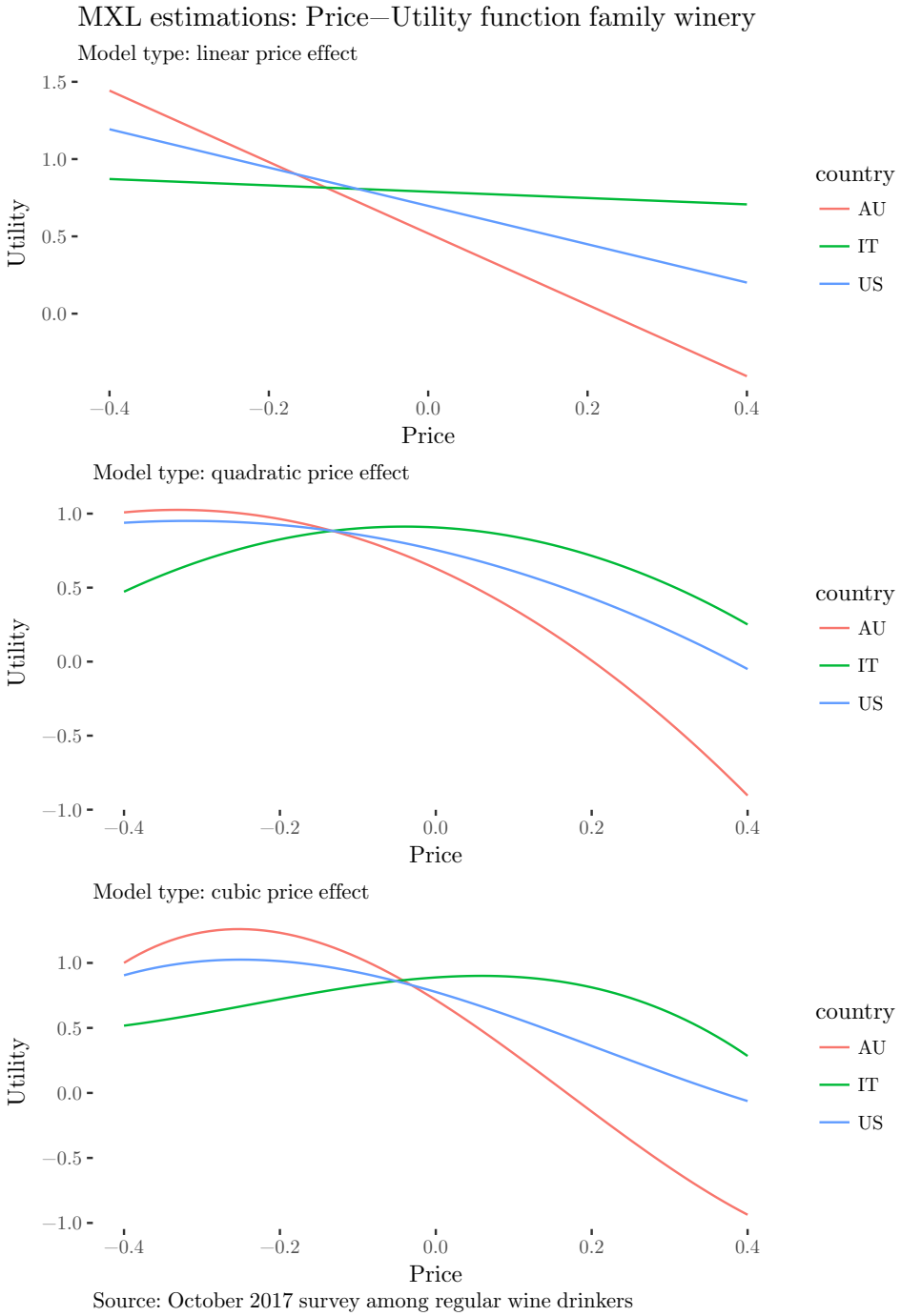
	Model	Linear		Quadratic		Cubic	
	α	0.1	0.05	0.1	0.05	0.1	0.05
Country	Australia	A	A	B	B	**C**	**C**
	Italy	A	A	**B**	**B**	**B**	**B**
	United States	A	A	**B**	**B**	**B**	**B**

Note: Familywise error controlled while performing multiple tests (Hommel 1988)

The parameter estimates of the three models were used to visualise the price-utility function in presence of the family attribute. The price-utility relationship for each of the three models is shown in figure 6.6. The linear model specification shows a negative relationship between the both variables in all three countries. In the quadratic models clear differences appear in monotonicity among the countries. In the quadratic model among the Australian and US consumer sample utility shows a vast negative association with price. However, in the Italian consumer sample first a clear positive and later a negative relationship of utility and price is found. This observation for the Italian sample also holds in the cubic model. Such change in monotonicity becomes apparent for all countries in the cubic models. However, it may be remarked that for the Australian and US sample the change in monotonicity appears between the first and second price quintile, while in the Italian sample the monotonicity change appears between the third and fourth price quintile.

Likelihood ratio tests have been applied to identify the model with the best fit in each country. Results of these tests are summarised in table 6.2. It can be shown that the linear specification of the models is outperformed in any of the three countries. The preferableness of a given non-linear alternative model differs by the individual country.

Figure 6.6: Price-Utility relationship for the mixture models



Source: October 2017 survey among regular wine drinkers

Among the Australian sample a cubic model specification appears the most preferable. In any country quadratic models exhibit a significant better fit to the data than linear models. No differences could be detected between the fit of quadratic and cubic models among the Italian and US sample. Findings of the likelihood ratio tests are consistent with the conclusions that can be derived when using AIC in appendix table A.6. Similar findings can be derived using BIC with one exception in the US sample, where a linear model specification would be preferred according to this criterion. While the previous models perform a parameter estimation in preference space, one further linear model is derived to perform an estimation in willingness-to-pay space. Since this specification was only applicable for a linear model specification without interaction effects, no dedicated test of specification preferableness was performed. Results of this model are discussed in a dedicated part of the following subsection 6.1.3.

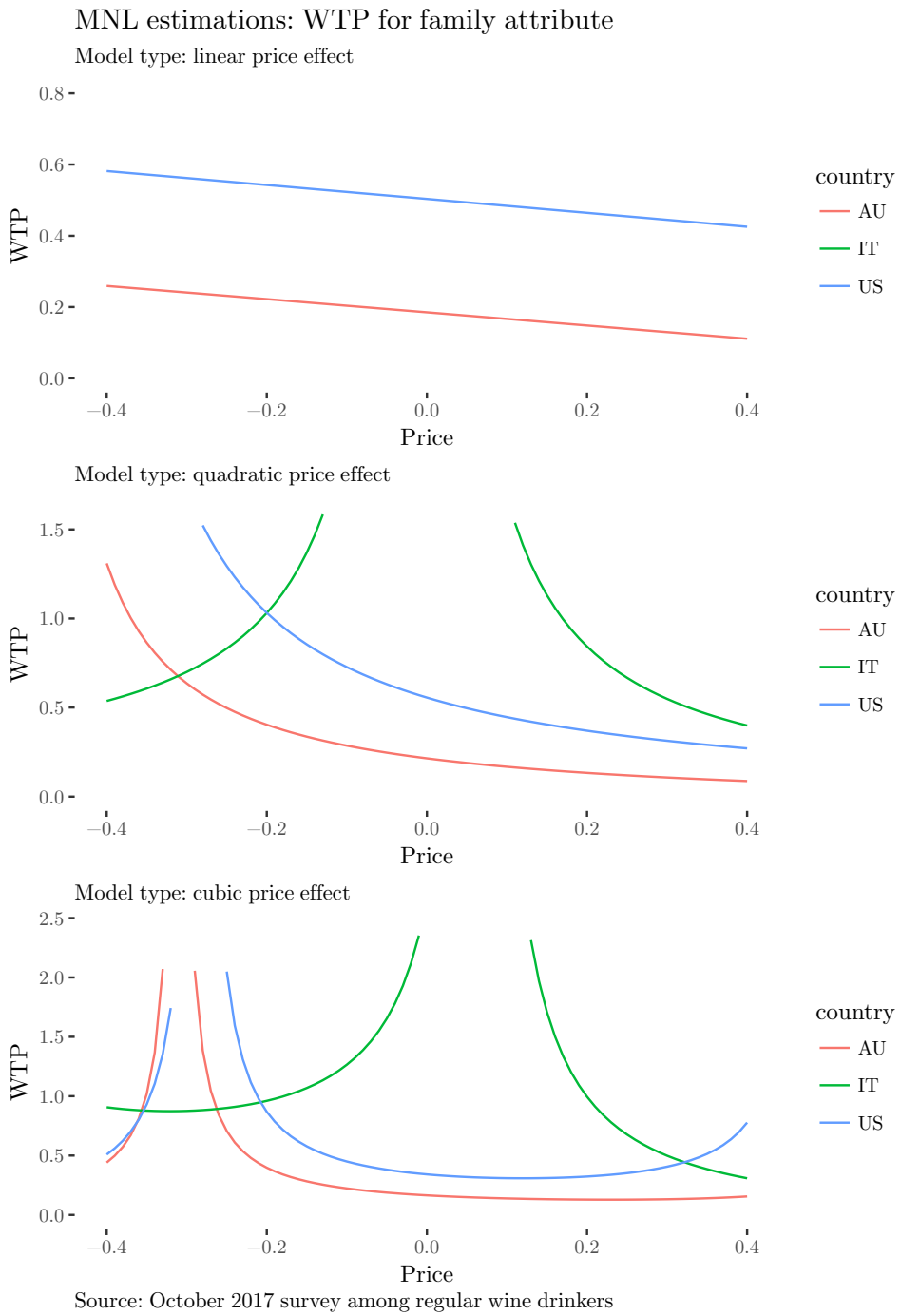
6.1.3 Willingness to pay

Different estimations have been performed to estimate respondents' willingness to pay. Willingness to pay for the family attribute is estimated based on the results of multinomial logistic models first. Subsequent estimations are performed using logistic mixture models in preference and willingness-to-pay space.

6.1.3.1 Logistic models

Willingness to pay is estimated independently for each of the three models and countries based on the methods presented in section 5.1.3.1. A graphic representation of the partial derivative (equation 5.25) is shown in figure 6.7 as a function of price x_{pri}. The chart of the linear model shows a monotonic decreasing willingness to pay for the family attribute as the price increases. It can be further seen that the willingness to pay is higher in the United States than it is in Australia. Italy is not included in the graph since values are far above the value range of the other estimations, and inclusion would reduce the clearness of the linear model chart. The fact that estimates are much higher is owed to the weak and insignificant price-utility correlation, as it can be seen from figure 6.5. The results of the estimation of the linear model in Italy (appendix A.3.1.2) show that the price and interaction effect are largely cancelling out any price-utility relationship. In the quadratic and the cubic models estimates for Italian respondents are more similar to the

Figure 6.7: Willingness to pay as a function of price derived from logistic models



Source: October 2017 survey among regular wine drinkers

Table 6.3: MNL estimate of $\overline{\text{WTP}}$ for family attribute

	Model		
Country	Linear	Quadratic	Cubic
Australia	19%	21%	22%
Italy	2174%	93%	95%
United States	50%	56%	48%

estimates of the Australian and US samples. In the quadratic model, the willingness to pay among the Australian and US samples follow a monotonous decreasing relationship as seen in the linear model. Due to the inverted U-shaped price-utility relationship in the quadratic model for Italy, the corresponding willingness to pay for the family firm attribute exhibits a changing monotonicity. Consistent with the findings of the linear model the willingness to pay among respondents in the US sample is found higher than in the Australian sample. Nonetheless, Italian respondents still exhibit the highest willingness to pay among the three countries. However, the differences between the estimates of the Italian sample and the other countries are markedly lower than in the linear model. In the cubic specification local maxima of the price-utility function can be observed for any of the three models, which also becomes obvious in the estimation of the willingness to pay. It may be emphasised that the cubic model is only preferred for modelling the utility functions among the Australian and US sample, while in Italy the cubic effects model does not further improve the fit of the model. The Australian and US samples show vast similarities with respect to the shape of the utility function.

Table 6.3 shows an overview of the estimated willingness to pay for the family winery attribute. Results derive from numeric integration of equation 5.28 within the interval $x_{\text{pri}} \in [-0.4, 0.4]$. In the table it can be seen that median estimates show vast similarities across the models at a country level. One notable exception is the estimated willingness to pay for the family attribute using the linear model specification in the Italian sample. The estimated willingness to pay among respondents in Australia within the choice experiment has shown to vary between 19 percent and 22 percent, depending on the model, while the former value represents the estimate of the preferable cubic model. In Italy, values range from 93 percent to 2174 percent, while the former value represents the estimate of the preferred quadratic model. The latter value is owed to the mathematical specification of the model, which has already been commented on in the previous section and shall be

Table 6.4: MNL estimate of $\overline{\text{WTP}}$ for family attribute in monetary units

	Model		
Country	Linear	Quadratic	Cubic
Australia	AUD 4.63	AUD 5.37	AUD 5.40
Italy	EUR 162.83	EUR 6.99	EUR 7.09
United States	USD 9.81	USD 10.84	USD 9.38

discussed further at a later point. In the United States, results range from 48 percent to 56 percent, where the former estimate represents the preferred value of the cubic model. When comparing the willingness to pay it is also important to consider that the median willingness to pay shown in table 6.3 refers to a base price which has been specifically set to average price consumers in a country spend for special occasions, which has been derived from Euromonitor International (2017*a*,*b*,*c*) following the proceeding specified in section 4.3. These price levels for the individual choice profiles (table 4.1) translate into an average price of AUD 24.99 in Australia, EUR 7.49 in Italy and USD 19.49 in the United States. Based on these estimates the absolute willingness to pay can be calculated for each model and country (table 6.4).

6.1.3.2 Logistic mixture models

The estimations of willingness to pay have also been performed using mixture models as described in section 5.1.3.2. Different estimation methods have been applied. First, an estimation in preference space was applied similar to the proceeding for logistic models. Second, an estimation in willingness-to-pay space complements the estimation using logistic mixture models.

Estimation in preference space The estimation of willingness to pay in preference space follows a similar process as the estimation using logistic models. Figure 6.8 shows the estimation of the three different model specifications in the three countries. The models do not include any interaction effect of price and the family attribute in order to obtain an estimate which follows a defined distribution. The linear specification of the models shows only the estimates of the Australian and the US samples as the estimate of the Italian sample is considerably higher and would skew the scale. For the linear model

Table 6.5: MXL estimate of $\overline{\text{WTP}}$ for family attribute

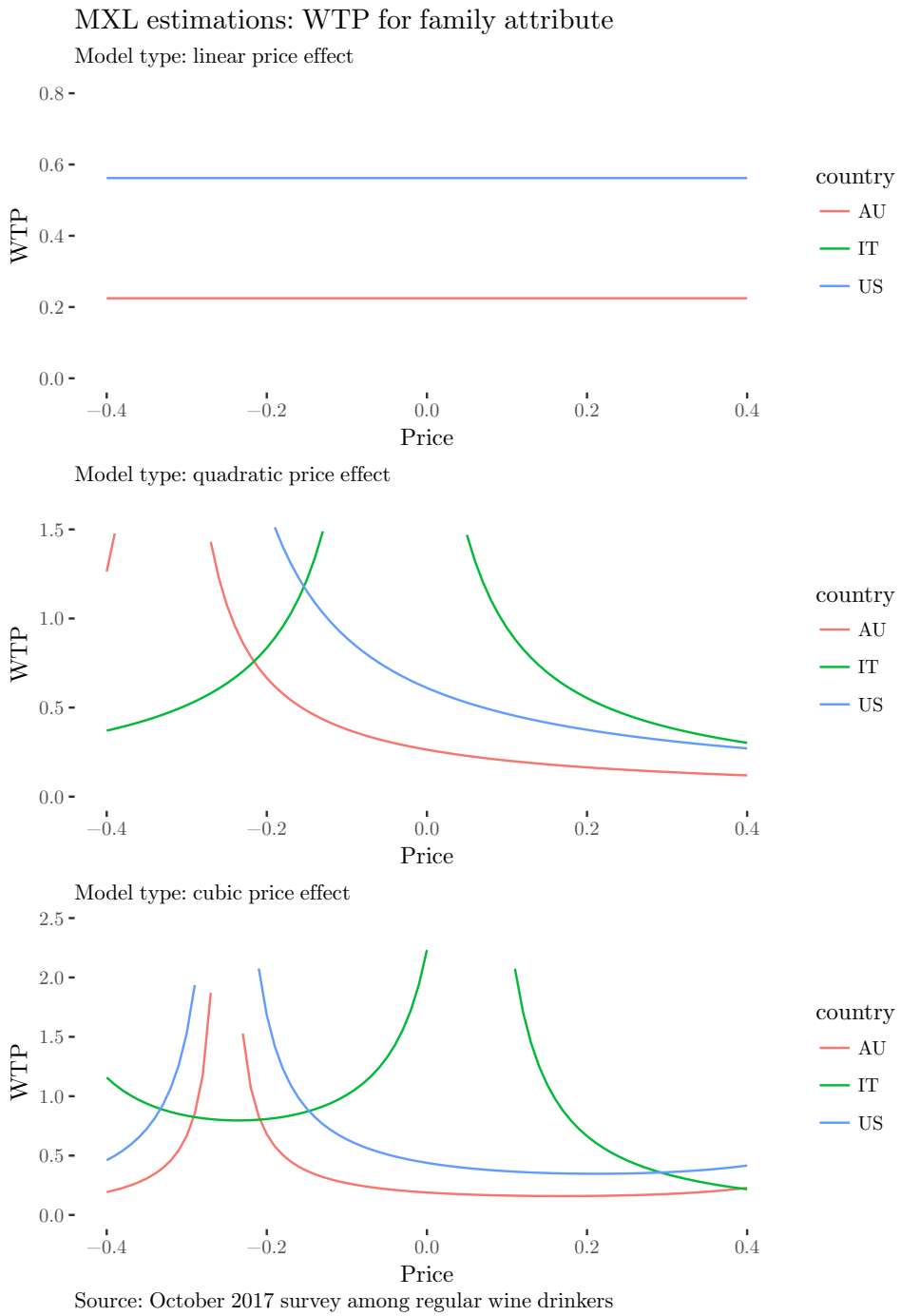
	Model		
Country	Linear	Quadratic	Cubic
Australia	22%	26%	23%
Italy	385%	66%	71%
United States	56%	59%	51%

specification it can be seen that the willingness to pay is independent from the price level. The estimated willingness to pay is highest for the Italian sample, followed by the US sample and found the lowest among the Australian sample in relative terms. The inverted U-shaped price-utility function in all three countries implies a changing monotonicity of willingness to pay in all three countries. All willingness to pay functions show asymptotic behaviour when the price converges towards the maximum of the price-utility function. In the Australian and US sample this asymptote is found at the lower end of the price range, while it is more central for the Italian sample. A behaviour comparable to the one of the quadratic model is found for the cubic model specification.

Table 6.5 shows the estimated willingness to pay for each of the three countries using three different model specifications. The estimation follows the same process as in subsection 6.1.3.1. The estimated willingness to pay in the Australian sample ranges from 22 percent using a linear model specification to 26 percent using a quadratic model specification, while the preferred cubic model provides an estimate for $\overline{\text{WTP}}$ of 23 percent. For the Italian sample estimates range from 66 percent using a quadratic model specification to 385 percent using a linear model specification, while the former quadratic model is preferred according to the results of the likelihood ratio test. The estimates of $\overline{\text{WTP}}$ in the US sample range from 51 percent using a cubic model specification to 59 percent using a quadratic model specification, while the latter quadratic specification is preferred according to the likelihood ratio tests.

The relative willingness to pay can be transformed into monetary units equally to the proceeding in the previous section. Table 6.6 shows the monetary equivalents of the estimates of $\overline{\text{WTP}}$ in the individual domestic currency of each country. Again, it can be seen that, differences, especially for the Italian sample, diminish after taking the absolute nominal median price points into consideration (cp. subsection 6.1.3.1).

Figure 6.8: Willingness to pay as a function of price derived from logistic mixture models



Source: October 2017 survey among regular wine drinkers

Table 6.6: MXL estimate of $\overline{\text{WTP}}$ for family attribute in monetary units

	Model		
Country	Linear	Quadratic	Cubic
Australia	AUD 5.61	AUD 6.47	AUD 5.82
Italy	EUR 28.83	EUR 4.93	EUR 5.33
United States	USD 10.96	USD 11.6	USD 10.02

Table 6.7: MXL estimation of WTP for family attribute in WTP space

Country	Relative	Absolute
Australia	17%	AUD 4.17
Italy[1]	49%	EUR 3.70
United States	50%	USD 10.84

[1]: inverted sign of coefficient

Estimation in willingness-to-pay space In addition to the estimation in preference space also an estimation in willingness-to-pay space has been performed. One model per country has been estimated using a linear model specification without interaction effects (cp. appendix A.4.1). The results for each model are summarised in table 6.7.
Estimates of willingness to pay in the models in Australia and the United States are vastly similar to the estimates of $\overline{\text{WTP}}$ for a linear model specification which have been estimated using MNL (cp. appendix A.3 and table 6.3) and MXL (cp. appendix A.4 and table 6.5) models. In addition, a significance test of coefficient estimates in willingness-to-pay space shows a highly significant result ($p < .00$) for both countries (cp. appendix A.4.1.1 and A.4.1.3). The coefficient estimate for the Italian sample shows an inverted sign (cp. appendix A.4.1.2) and the p-value ($p = .05$) of a significance test for the coefficient estimate is higher than in the other two countries.

6.1.4 Relative attribute importance

The relative importance of attributes included in the model is calculated as described in section 5.1.4 based on the parameter estimates of the logistic mixture models. The results are summarised per country in tables 6.8 (Australia), 6.9 (Italy) and 6.10 (United States). The model estimation for the Australian sample shows a clear rank of attribute impor-

Table 6.8: Relative attribute importance: Australia

	Model		
Variable	Linear	Quadratic	Cubic
Origin	38%	37%	35%
Price	29%	29%	31%
Suggestion	14%	13%	13%
Gold medal	11%	11%	11%
Family	8%	9%	10%

Table 6.9: Relative attribute importance: Italy

	Model		
Variable	Linear	Quadratic	Cubic
Origin	60%	54%	55%
Gold medal	16%	14%	14%
Family	12%	13%	12%
Suggestion	3%	10%	10%
Price	10%	9%	9%

tance. The aggregate measure of origin is by far the most important attribute, which calls however for further discussion, due to the pattern that can be observed in the disaggregated data in appendix A.3. Origin is followed by price, recommendation by a friend and gold medal. The family firm attribute takes the last rank.

Similarly, origin shows to be the most important attribute among the Italian data and takes an even more central role for respondents compared to the other attributes. The gold medal and the family winery attributes rank second and third with respect to their relative importance among Italian respondents and are followed by suggestion by a friend. The price takes the last rank in the higher order model, while in the linear model suggestion by a friend is found to rank last.

Price is the most important choice driver for respondents in the US sample, followed by suggestions by friends. However, the family winery attribute and the origin of a wine follow closely with respect to their importance. Gold medals have been found to be the least important attribute among the tested set of variables.

Table 6.10: Relative attribute importance: United States

	Model		
Variable	Linear	Quadratic	Cubic
Price	25%	25%	27%
Suggestion	22%	22%	21%
Family	18%	19%	19%
Origin	20%	19%	18%
Gold medal	15%	15%	15%

6.2 Research question 2

The results of the investigation into research question 2 are presented in several stages throughout the following subsections. Results of the univariate analysis are presented first to provide a general overview of the specific data related to research question 2. The findings from subsequent multivariate analysis follow in the adjacent subsections. First, differences between firm types are presented for the variables of brand knowledge, brand relationship and behavioural outcomes. Figure 6.9 exhibits the average score for each construct grouped by firm type and country. Family firms are significantly different from corporate firms for any of the investigated constructs. The first look reveals that the average scores of each construct are significantly different between family wineries and their corporate counterparts. The variable of family firm image exhibits the largest absolute difference among both firm types. Customer orientation is the most important brand knowledge attribute that differentiates both types of firms in absolute terms in any of the three countries. Although family wineries score significantly higher for all the brand relationship variables, there is no variable which consistently shows a stronger potential to differentiate family firms from their non-family counterparts. Variables that measure behavioural outcomes also exhibit significantly higher scores for the group of family firms and attitudinal loyalty shows larger absolute differences than the construct of behavioural loyalty across all countries.

Figure 6.9: Firm attributes by country

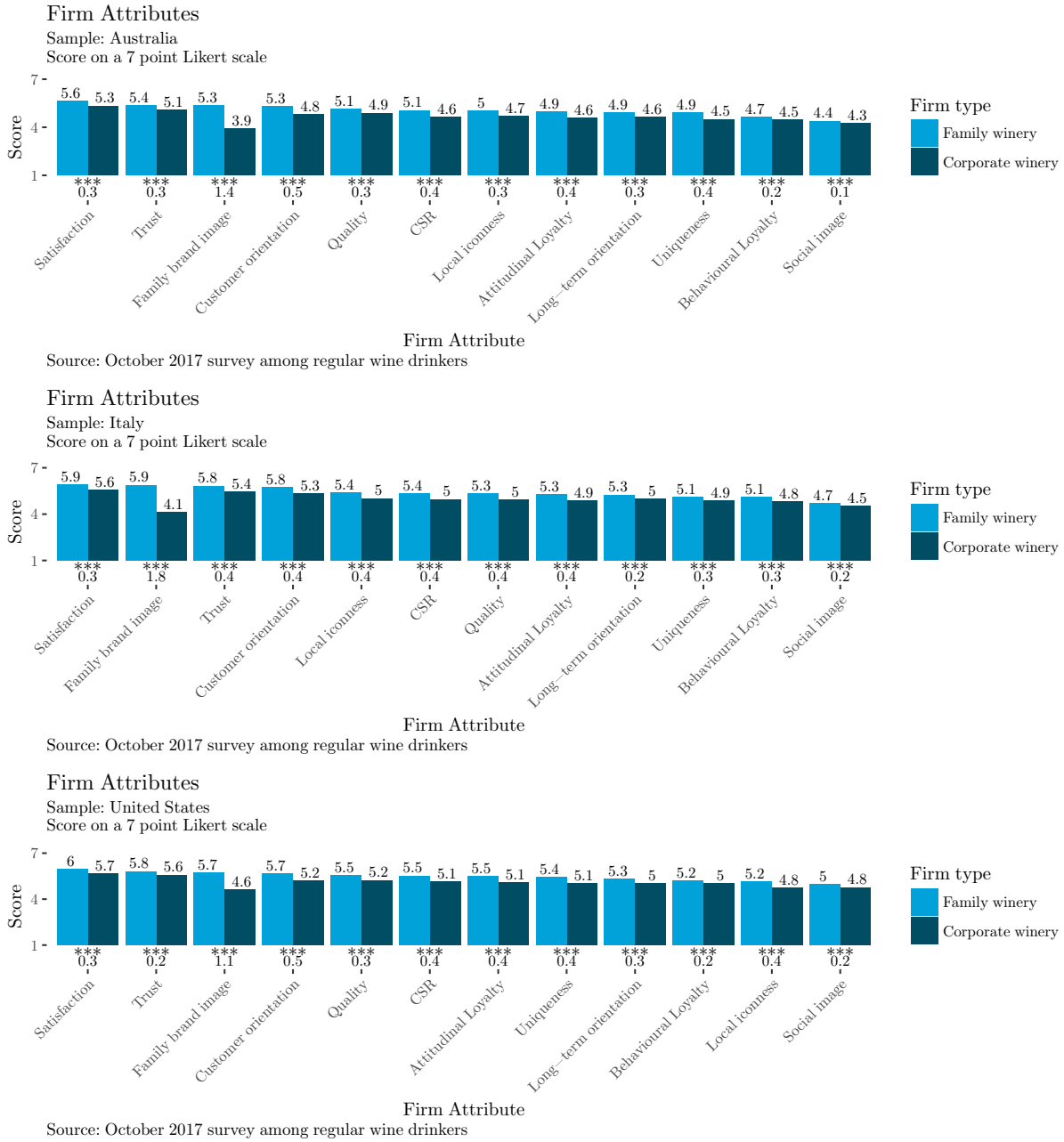


Table 6.11: Scale reliability of latent variables by country

	Australia			Italy			United States			Pooled		
	α	CR	AVE	α	CR	AVE	α	CR	AVE	α	CR	AVE
Behavioural loyalty	0.73	0.73	0.57	0.80	0.80	0.67	0.78	0.79	0.65	0.78	0.78	0.64
Attitudinal loyalty	0.77	0.77	0.63	0.80	0.80	0.66	0.84	0.84	0.73	0.81	0.81	0.68
Satisfaction	0.87	0.87	0.70	0.90	0.90	0.76	0.87	0.87	0.69	0.88	0.89	0.72
Trust	0.89	0.89	0.73	0.89	0.89	0.73	0.89	0.89	0.73	0.89	0.89	0.73
Uniqueness	0.93	0.94	0.78	0.94	0.94	0.78	0.94	0.94	0.81	0.94	0.94	0.80
Social image	0.93	0.93	0.77	0.92	0.93	0.77	0.93	0.94	0.79	0.93	0.93	0.77
Perceived quality	0.89	0.89	0.67	0.91	0.91	0.72	0.91	0.91	0.72	0.90	0.91	0.71
Localness	0.89	0.89	0.79	0.83	0.83	0.71	0.85	0.85	0.75	0.86	0.86	0.75
Corporate social responsibility	0.85	0.85	0.65	0.91	0.91	0.77	0.87	0.87	0.69	0.88	0.88	0.71
Long-term orientation	0.80	0.81	0.59	0.81	0.81	0.60	0.86	0.86	0.67	0.83	0.83	0.62
Customer orientation	0.90	0.90	0.75	0.90	0.91	0.77	0.91	0.91	0.76	0.91	0.91	0.77
Family firm identity	0.94	0.94	0.85	0.95	0.95	0.86	0.95	0.95	0.86	0.95	0.95	0.86

Australia: n=1026; Italy: n=1036; United States: n=1020

6.2.1 Scale reliability

Before implementing the structural model, the validity of the measurement model has been assessed. Key indicators of this assessment have been the most commonly used measures in structural equation modelling, which are Cronbach's alpha (α, Cronbach 1951), composite reliability according to Raykov (CR, 2001) and average variance extracted (AVE, Fornell and Larcker 1981). Table 6.11 summarises the numeric values of these three scale reliability indicators by country.

The assessment of the individual indicators could identify one manifest variable exercising a strong negative effect on scale reliability of one latent variable. This manifest variable has been the third item (cp. section 4.4.3.4) of the localness scale. Although this item has been previously validated within the localness scale in earlier research, it may be assumed that the detrimental effect stems from the reversed coding of the scale item. Such issues with reverse coded items are well known in literature and can severely affect the fit of structural models (Weijters et al. 2013). The respective scale item has been excluded from the measurement model of the localness construct to improve scale reliability across the samples. Another manifest variable had to be excluded from the measurement model during the analysis of measurement invariance (cp. section 5.2.1.3). More specifically, the relevant manifest variable was a cause of rejecting strong invariance of the measurement model (cp. section 6.2.3)[5]. No negative effect on scale reliability was observed after excluding this variable.

As table 6.11 shows, the lowest α for the Australian sample is observed for the latent variable of behavioural loyalty ($\alpha = .73$). Similarly, the lowest values for CR and AVE are found for this variable in the Australian sample (CR = .73, AVE = .57). This pattern holds among respondents of the US sample, however at higher absolute scores of the individual indicators ($\alpha = .79$, CR = .79, AVE = .65). In the Italian sample, attitudinal loyalty is the latent variable with the lowest reliability for the three indicators ($\alpha = .80$, CR = .80, AVE = .67), while in the pooled sample it is behavioural loyalty ($\alpha = .78$, CR = .78, AVE = .64) that exhibits the lowest reliability.

[5]The results of the scale reliability analysis, especially the ones presented in table 6.11, are after this adjustment to provide an overview of the final measurement model.

6.2.2 Multinormality

Maximum likelihood estimation of structural equation models assumes multinormality of the data under investigation. Omnibus tests for multivariate skewness and kurtosis are performed following the test statistics presented in section 5.2.2.1 to test whether this precondition is fulfilled. Since it is shown in section 6.2.3 that strict invariance holds for the measurement items, the assessment of multinormality is performed on the pooled sample only. Both tests for skewness and kurtosis are highly significant ($b_{1,36} = 78.35$, $z_{1,36} = 40244.95$; $b_{2,36} = 1974.34$, $z_{2,36} = 321.77$; $p < .001$ respectively), which leads to reject the assumption of multinormality. Due to this outcome it is important to have a closer look at the distributional characteristics of the individual manifest variables. Table 6.12 provides the most relevant summary statistics of the manifest variables.
According to the suggestions of previous research (cp. section 5.2.2.1), the indicators in table 6.12 point out a modest skewness and kurtosis of the individual variables. As it can be seen from the mean and the negative sign of the skewness the distribution exhibits a shift to the upper half of the measurement scale. The sign and the degree of kurtosis is changing by the individual manifest variables, its absolute value indicates a very modest derivation from normality (cp. table 6.12). From these findings it can be concluded that robust Satorra and Bentler (1994) scaled test statistics and fit indices are the preferred approach to account for this marginal yet statistically significant non-normality of the data in the structural equation model. The conjunction of scaled test statistics and computation of robust standard errors appropriately addresses the particularities of the given dataset and makes maximum likelihood the preferred model estimation method.

6.2.3 Scale invariance

Scale invariance is tested based on the model specification summarised in figure 4.3 following the protocol described in paragraph 5.2.1.3. Scale invariance is tested for a model where country has been grouping variable of interest. This analysis is performed to understand whether respondents in the different countries use the scales in the same way.
One scale item had to be excluded from the measurement model due to the violation of strong invariance across groups. This concerns the second item of the trust scale (cp. section 4.4.2.1) which has been initially proposed by Chaudhuri and Holbrook (2001). In an earlier study in the field by Bianchi et al. (2014) the same scale has been used. It is

Table 6.12: Descriptive statistics of manifest variables

Construct	Item	Mean	Sd	Skewn.	Kurtosis	Se
Behavioural loyalty	1	5.06	1.31	−0.47	0.09	0.02
	2	5.50	1.19	−0.80	0.87	0.02
Attitudinal loyalty	1	4.82	1.48	−0.46	−0.25	0.03
	2	4.65	1.55	−0.40	−0.46	0.03
Satisfaction	1	5.82	1.01	−1.09	2.17	0.02
	2	5.77	1.02	−0.94	1.61	0.02
	3	5.45	1.18	−0.74	0.53	0.02
Trust	1	5.64	1.08	−0.70	0.58	0.02
	2	5.62	1.10	−0.74	0.67	0.02
	3	5.61	1.07	−0.55	0.13	0.02
Uniqueness	1	5.08	1.26	−0.44	−0.06	0.02
	2	5.03	1.31	−0.40	−0.17	0.02
	3	4.92	1.33	−0.30	−0.28	0.02
	4	4.89	1.35	−0.36	−0.18	0.02
Social image	1	4.41	1.58	−0.31	−0.26	0.03
	2	4.44	1.54	−0.34	−0.23	0.03
	3	5.04	1.41	−0.71	0.43	0.03
	4	4.51	1.53	−0.39	−0.17	0.03
Perceived quality	1	5.29	1.23	−0.66	0.47	0.02
	2	4.84	1.35	−0.36	−0.08	0.02
	3	5.09	1.27	−0.48	0.13	0.02
	4	5.52	1.14	−0.76	0.83	0.02
Localness	1	5.39	1.21	−0.61	0.30	0.02
	2	5.40	1.23	−0.59	0.09	0.02
Corporate social responsibility	1	5.23	1.16	−0.16	−0.43	0.02
	2	4.91	1.25	−0.01	−0.26	0.02
	3	5.21	1.17	−0.16	−0.45	0.02
Long-term orientation	1	4.71	1.21	0.21	−0.04	0.02
	2	5.20	1.18	−0.09	−0.58	0.02
	3	5.18	1.17	−0.03	−0.65	0.02
Customer orientation	1	5.33	1.19	−0.08	−1.05	0.02
	2	5.29	1.17	−0.09	−0.89	0.02
	3	5.43	1.14	−0.32	−0.51	0.02
Family firm identity	1	5.01	1.68	−0.73	−0.26	0.03
	2	5.05	1.62	−0.76	−0.14	0.03
	3	4.95	1.65	−0.65	−0.34	0.03

n=3082

Note: mean and standard deviation are reported to maintain a clear-cut structure of the table; the discrete distribution of the individual levels of each item can be found in table A.10

Table 6.13: Measurement invariance models for country group variable

	Model	LR (df)	p	RMSEA	CFI	Δ_{CFI}
Group	Pooled	7241 (599)		0.059	0.944	
	Austalia	3121 (599)		0.061	0.927	
	Italy	3247 (599)		0.062	0.931	
	United States	2893 (599)		0.058	0.941	
Invariance	Configural	9262 (1797)		0.061	0.933	
	Weak	9474 (1845)	0.000	0.060	0.932	0.002
	Strong	10084 (1893)	0.000	0.062	0.926	0.006
	Strict	10733 (1965)	0.000	0.063	0.921	0.005
	Structural	11160 (1989)	0.000	0.064	0.917	0.004

Note: robust adjustment of RMSEA and CFI for non-normality; LR is the non-scaled test statistic; p computed according to Satorra and Bentler (2001)

interesting that also in this context the second item has been omitted, however no details are presented by the authors why the item was excluded. Nonetheless, Bianchi et al. did not carry out multi-group structural equation modelling, hence the manifest variable has most likely been excluded for another reason. Since scale reliability did not decrease after elimination of the indicator, the approach taken may be considered appropriate.

Table 6.13 shows the invariance tests for the country group variable after removing one manifest variable as described above. The model without group distinction (pooled sample) exhibits a favourable fit (CFI = .944, RMSEA = .059). Similarly, the models at country level exhibit comparative fit indices well above the cut-off criteria of CFI > .90 and RMSEA < .08 (Hair et al. 2013). The estimation of separate models using group level (country) data, as shown in the upper half of table 6.13, serves to ensure an appropriate fit of the model within each group before testing invariance. As the results indicate an appropriate fit at group level, tests for invariance for the country group variables are conducted in the following step. Configural invariance represents the first model of the invariance test. As this level of invariance only assumes the same structure of variables, this model serves as a baseline model when testing for weak invariance. When adding the restriction of equal factor loadings to this baseline model, a decrease of CFI by .002 indicates that the assumption of weak invariance holds[6]. Strong invariance is tested through the addi-

[6]It can be seen that the nested likelihood ratio test of both models is significant, however it has been discussed that tests are overly sensitive for large samples and that the Δ_{CFI} criterion is more appropriate

tional constraint of equal intercepts of the manifest variables. Further, the assumption of strong invariance holds as the change in CFI of .006 is well below the critical threshold. Finally, strict invariance is tested by a further constraint of equal error variances across the countries. A decrease of CFI by .005 indicates that strict invariance of the data can be assumed. It can be concluded using the Δ_{CFI} cut-off criterion (discussed in section 5.2.1.3) that scales implemented in the questionnaire yield measures of the same latent variables across the three countries.

6.2.4 Path coefficient estimates

Since the assumption of strict invariance holds, a model with constrained factor loadings, intercepts and error variances is estimated for the three groups. Table 6.14 summarises the estimated path coefficients and covariances by country. Further, the table includes a global test for differences of path coefficients across groups (Satorra and Bentler 2001). The results of the latent variable model are presented in the following paragraphs[7] in the context of the hypotheses which have been introduced in section 4.4.

6.2.4.1 Relationships between latent variables

Hypothesis 1 can be fully supported for each of the three countries, as it can be constituted from the data that brand trust positively affects attitudinal loyalty. However, significant differences in the magnitude of this effect are observed between the three countries. The effect of brand trust on attitudinal loyalty is the highest in Italy and the least constituted among Australian respondents. Hypothesis 2 is also supported for each of the three countries. In this case no significant differences for the magnitude of the effect between countries could be found. It is hence constituted based on the three samples that brand trust positively affects behavioural loyalty. From the model it can also be derived that brand satisfaction significantly positively influences attitudinal loyalty (hypothesis 3). However, for this measure significant differences between the countries are found. The magnitude of this relationship is the most pronounced in Australia, while it is the

in this context.

[7] Relevant parameter estimates can be found in table 6.14 and are omitted in the following paragraphs where possible to avoid redundancies.

Table 6.14: Coefficient estimates of the latent variable model

			Australia			Italy			United States			
Path			Est	Se	p	Est	Se	p	Est	Se	p	$p_{\chi^2_{diff}}$
Family firm image	←	Family firm status	0.50	0.07	0.00	0.48	0.07	0.00	0.44	0.07	0.00	0.82
Customer orientation	←	Family firm image	0.79	0.04	0.00	0.82	0.04	0.00	0.85	0.03	0.00	0.47
Long-term orientation	←	Family firm image	0.69	0.03	0.00	0.70	0.04	0.00	0.78	0.03	0.00	0.06
CSR	←	Family firm image	0.80	0.04	0.00	0.89	0.04	0.00	0.86	0.03	0.00	0.25
Localness	←	Family firm image	0.81	0.04	0.00	0.74	0.04	0.00	0.83	0.03	0.00	0.06
Perceived quality	←	Family firm image	0.85	0.04	0.00	0.98	0.04	0.00	0.93	0.03	0.00	0.08
Social image	←	Family firm image	0.86	0.05	0.00	1.00	0.05	0.00	1.03	0.04	0.00	0.02
Uniqueness	←	Family firm image	0.93	0.04	0.00	0.96	0.05	0.00	0.94	0.03	0.00	0.83
Brand trust	←	Customer orientation	0.24	0.04	0.00	0.22	0.04	0.00	0.25	0.05	0.00	0.93
Brand trust	←	Long-term orientation	−0.11	0.09	0.19	0.12	0.06	0.04	−0.04	0.07	0.51	0.04
Brand trust	←	CSR	0.29	0.06	0.00	0.13	0.05	0.01	0.21	0.07	0.00	0.12
Brand trust	←	Localness	0.16	0.05	0.00	0.18	0.04	0.00	0.05	0.06	0.38	0.13
Brand trust	←	Perceived quality	0.38	0.05	0.00	0.23	0.05	0.00	0.39	0.07	0.00	0.08
Brand trust	←	Social image	−0.03	0.02	0.14	0.04	0.02	0.04	−0.05	0.02	0.04	0.00
Brand trust	←	Uniqueness	−0.03	0.04	0.43	0.05	0.04	0.16	−0.02	0.05	0.74	0.38
Brand satisfaction	←	Customer orientation	0.09	0.04	0.01	0.10	0.04	0.00	0.04	0.04	0.28	0.53
Brand satisfaction	←	Long-term orientation	−0.19	0.07	0.00	0.10	0.04	0.02	−0.20	0.06	0.00	0.00
Brand satisfaction	←	CSR	0.05	0.05	0.39	0.01	0.04	0.83	0.15	0.06	0.01	0.15
Brand satisfaction	←	Localness	0.22	0.04	0.00	0.27	0.03	0.00	0.15	0.05	0.00	0.10
Brand satisfaction	←	Perceived quality	0.62	0.05	0.00	0.33	0.04	0.00	0.50	0.06	0.00	0.00
Brand satisfaction	←	Social image	−0.04	0.02	0.01	−0.05	0.02	0.00	−0.06	0.02	0.01	0.90
Brand satisfaction	←	Uniqueness	−0.01	0.04	0.78	0.08	0.03	0.01	0.11	0.04	0.01	0.09
Brand satisfaction	↔	Brand trust	0.09	0.01	0.00	0.06	0.01	0.00	0.03	0.02	0.04	0.02
Attitudinal loyalty	←	Brand trust	0.38	0.09	0.00	0.74	0.08	0.00	0.44	0.09	0.00	0.02
Attitudinal loyalty	←	Brand satisfaction	0.74	0.11	0.00	0.51	0.09	0.00	0.94	0.11	0.00	0.00
Behavioural loyalty	←	Brand trust	0.19	0.08	0.02	0.33	0.07	0.00	0.20	0.06	0.00	0.31
Behavioural loyalty	←	Brand satisfaction	0.75	0.10	0.00	0.71	0.09	0.00	0.92	0.07	0.00	0.10
Behavioural loyalty	↔	Attitudinal loyalty	0.27	0.03	0.00	0.11	0.02	0.00	0.19	0.03	0.00	0.00

Note: Unstandardised parameter estimates (Est), robust standard errors (Se) and Satorra and Bentler (2001) test for group parameter differences ($p_{\chi^2_{diff}}$) reported

weakest in the US sample. Despite these differences, all path coefficients are highly significant in any country. Further, hypothesis 4 could be confirmed for all countries, while no differences of the hypothesised relationship could be detected between countries. Hence, it can be assumed that brand satisfaction positively affects behavioural loyalty. Pattern between the countries for the effects between the variables measuring brand relationship and behavioural outcomes can be observed: The coefficient estimates show that particularly among Italian respondents brand trust plays a much higher role in the development of attitudinal loyalty, while respondents in Australia and the United States put a stronger emphasis on brand satisfaction. Further, the model-implied covariance between attitudinal loyalty and behavioural loyalty significantly differs between the countries. The least covariance of the variables is observed in the Italian sample, while the highest covariance is found for Australian respondents.

The following hypotheses represent the link between variables of brand knowledge and brand relationship. First, a significant positive relationship between family firm image and uniqueness is found, which leads to accept hypothesis 5. For this relationship no significant differences can be observed between the three countries. Hypothesis 6, which postulates a relationship between uniqueness and brand trust, could not be confirmed by the analysis in any country as the respective path coefficient is not found to significantly differ from zero. However, it has been found that an effect of uniqueness on brand satisfaction could partially be confirmed (hypothesis 7) and differences between the countries are significant at $p_{\chi^2_{\text{diff}}} = .09$. While no effect could be found in the Australian sample, a significant positive influence is found among the Italian and the US samples.

Family firm image is found to show a significant positive association with social image. The strength of this association differs between the countries in the sample. The largest effects are found among US and Italian respondents, while weaker but still highly significant effects are observed in the Australian sample. Based on these findings hypothesis 8 can be fully accepted. Hypothesis 9, which states a positive effect of social image on brand trust, is partially confirmed in the model. In Italy, a significant positive effect could be confirmed. However, in the US a negative effect of social image on brand trust is established by the model. For the Australian sample, no relationship between the variables could be established. It can be statistically confirmed that the relationship between the two variables differs significantly between the countries. The effect of social image on brand satisfaction, however, has been found to be negative across all three countries

(hypothesis 10), without any differences between the countries.
Perceived quality has shown to be positively influenced by family firm image in all countries. For this reason hypothesis 11 can be accepted. The magnitude of this effect differs between the countries. The strongest influence of family firm image on perceived quality can be found among the Italian sample while the weakest association is found among Australian respondents. In hypothesis 12 a positive effect of product quality on brand trust is hypothesised. The model results confirm this relationship across the three countries. Differences of this effect between the countries in the sample are found at a $p_{\chi^2_{\text{diff}}} = .08$ significance level. Italy shows the weakest association between the variables, while among the US (and Australian) sample the effect shares a similar magnitude at a higher level than in the Italian sample. Perceived quality also significantly positively influences brand satisfaction in all three countries, which leads to accept hypothesis 13. The effect, however, differs between the countries in the sample. The strongest relationship between the variables is found for the Australian sample, while the weakest, yet highly significant, association is found among Italian respondents. As it is seen from both hypotheses, in Italy the effect of perceived quality both on brand trust and satisfaction is the lowest among the countries.
Localness is significantly influenced by family firm image, which leads to accept hypothesis 14 across all countries. Differences between countries exist and strongest associations are found among US and Australian consumers, while weaker, but still significant effects, are observed among Italian respondents. Hypothesis 15 states that localness positively influences brand trust. This relationship could be confirmed for the Australian and the Italian sample, while no effect could be established for the US sample. No differences are observed with respect to effect size between the countries. Further, localness has been found to positively influence brand satisfaction in all three countries, which leads to accept hypothesis 16. Differences between the countries can be found, although at a weak significance level. In this regard a stronger relationship between both variables is observed among Italian respondents, while the weakest relationship is observed for US respondents. Although no significant country differences have been found ($p_{\chi^2_{\text{diff}}} = .13$) for the relationship of this variable on trust (hypothesis 15), the pattern between the coefficients of the countries are the same as the ones found in the context of hypothesis 16.
Corporate social responsibility is a further latent variable that shows to be significantly

influenced by family firm image (hypothesis 17). This association exhibits homogeneity across the countries. Further, a positive effect of corporate social responsibility on brand trust is established in hypothesis 18. The findings confirm this hypothesis in each of the three countries, while a test for differences between the countries fails to be significant. In summary hypothesis 18 can be accepted. A positive effect of corporate social responsibility on brand satisfaction (hypothesis 19) has only been found significant among US respondents, while for Italian and Australian respondents the relevant effect did not significantly differ from zero. For this reason, hypothesis 19 can only be partially accepted. Family firm identity exercises a positive influence on long-term orientation of firms across all countries, which leads to accept hypothesis 20. Heterogeneity of the effects of this relationship is observed. The strongest effect is found among US respondents, while the weakest effect is observed among the Australian sample. The relationship of long-term orientation and brand trust shows mixed findings that differ significantly between the countries. While in the Italian sample the hypothesised effects as found significantly positive and hence in line with the hypothesis, no significant effect could be observed for respondents in Australia and in the United States. For this reason, hypothesis 21 can only be partially confirmed. The results regarding the effect a long-term orientation has on brand satisfaction are more marked: Again, significant differences exist between the countries. Similar to the previous hypothesis it can be seen that Italian consumers positively associate a long-term orientation with brand satisfaction, and hypothesis 22 can be accepted. Australian and US consumers, however, exhibit a significant negative relationship between the variables, which leads to reject hypothesis 22 for both New World wine countries.

Similar to other brand knowledge variables, family firm image in all countries exercises the same positive influence on customer orientation. Hypothesis 23 is accepted for this reason. The positive effect of customer orientation on brand trust, which is constituted in hypothesis 24, can be confirmed for all countries. Differences between countries regarding the magnitude of the effect are not found. Regarding the effect of customer orientation on brand satisfaction, the Italian and the Australian samples shows a significant relationship between the variables. However, no significant effect is found for the US sample. Hence, hypothesis 25 can only be partially accepted.

Table 6.15 summarises the hypothesis test results. All in all, the structural model provides strong evidence that family firm image exercises a significant positive effect on each of the

Table 6.15: Summary of hypothesis test results by country

	Australia	Italy	United States
H_1	✓	✓	✓
H_2	✓	✓	✓
H_3	✓	✓	✓
H_4	✓	✓	✓
H_5	✓	✓	✓
H_6	×	×	×
H_7	×	✓	✓
H_8	✓	✓	✓
H_9	×	✓	×
H_{10}	×	×	×
H_{11}	✓	✓	✓
H_{12}	✓	✓	✓
H_{13}	✓	✓	✓
H_{14}	✓	✓	✓
H_{15}	✓	✓	×
H_{16}	✓	✓	✓
H_{17}	✓	✓	✓
H_{18}	✓	✓	✓
H_{19}	✓	✓	×
H_{20}	✓	✓	✓
H_{21}	×	✓	×
H_{22}	×	✓	×
H_{23}	✓	✓	✓
H_{24}	✓	✓	✓
H_{25}	✓	✓	×
H_{26}	✓	✓	✓

Note: "✓" indicates acceptance of hypothesis; "×" indicates rejection of hypothesis

variables of brand knowledge included in the model. However, it is also found that the pathways how these variables affect brand relationship and ultimately behavioural outcomes are diverse. The vast majority of the hypothesised relationships could be confirmed across all countries, while some other hypotheses were partially confirmed (hypotheses 7, 9, 13, 19, 21, 22 and 25) and two hypotheses were consistently rejected in all countries (hypotheses 6 and 10).

6.2.4.2 Family firm status as covariate

A central element of this research is to point out how family firm image influences individual elements of brand knowledge and to identify how this relationship ultimately translates into behavioural outcomes. This investigation is carried out using a two-step approach. First, it is investigated how family firm image ultimately affects behavioural outcomes. The previous subsection 6.2.4.1 provides a comprehensive overview of these relationships. Second, it is important to ensure that these perceived differences originate from the fact that a business actually is a family firm (family firm status). For this reason, the covariate family firm status has been introduced in the model.
It can be seen from the results in table 6.14 that a significant positive relationship can be established between the variables of family firm image and family firm status, which leads to accept hypothesis 26 in all countries. This result underlines that family firms are indeed significantly different from their non-family counterparts with respect to their perceived family firm image. It can further be constituted that the magnitude of this relationship is homogeneous between the countries in the sample.

6.2.5 Latent means

The structural model shown in figure 4.3 is analysed for differences in latent means between family and corporate wineries at a country level. In order to carry out this analysis, the family firm status variable was excluded to obtain identification of the model. Before investigating latent means, measurement invariance of the model for both groups has been ensured. The related test procedure shows that strict invariance of the measurement model holds in any country. In order to remain focused on latent means, the relevant results are swapped out to appendix A.7. Latent mean differences are computed following the process described in section 5.2.1.3. Table 6.16 shows the differences of latent means

between family and corporate wineries by country. The effect sizes range from small effects to large effects.
In any country, the differences of the family firm image variable are the most marked. In the pooled sample, differences of the latent variable of customer orientation rank second and indicate a medium effect size. Customer orientation ranks second in the US sample as well, however, ranks only third and fourth in the Australian and Italian sample, respectively. Differences in long-term orientation take rank nine in the pooled, Australian and Italian sample, while taking the eighth rank in the US sample. Corporate social responsibility ranks fourth in the pooled, Australian and US sample, while being on the sixth rank among the Italian respondents. The differences for localness rank third in the pooled, Italian and US samples, while taking the second rank in the Australian sample. Differences in perceived quality for both business types rank eighth in the pooled sample, while taking ranks ten, five and nine in the Australian, Italian and US samples, respectively. Differences in social image consistently take the last rank number twelve. Differences in uniqueness take rank ten in the pooled sample and rank fifth, eleventh and fifth in the Australian, Italian and US samples, respectively. The difference of latent means for the variable of trust ranks fifth in the pooled sample and eighth, second and tenth in the three individual countries Australia, Italy and the United States, respectively. On overall, differences in brand satisfaction rank sixth, which is in line with the findings in the Australian and the US sample, while in Italy they take rank seven. Attitudinal loyalty ranks seventh on overall with regard to the observed differences between both firm types for this variables. This is in line with the results in Australia and the United States, while for the Italian sample the differences for this variable fall behind on the eighth rank. Differences for behavioural loyalty on overall take the second but last rank, which is also the case in Australia and the United States, while among Italian respondents the overall rank of differences for this variables is ten.

6.3 Research question 3

Research question 3 is investigated through the estimation of latent class logistic models. The estimation of these models is presented in an approach comparable to the one in section 6.1. However, primary focus in this section has been put rather on the latent classes than on different model specifications. To maintain succinctness of the results,

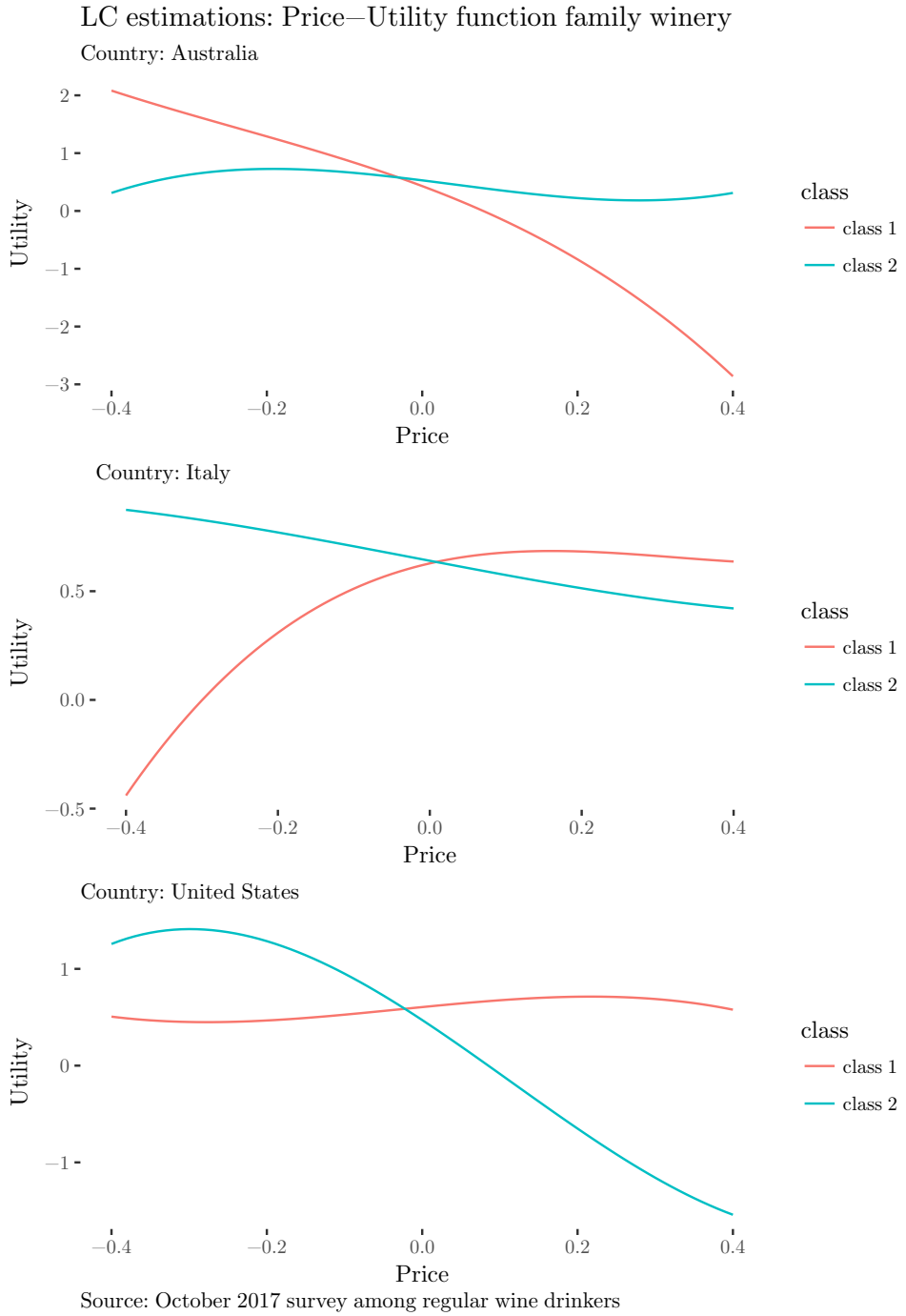
Table 6.16: Latent mean differences: family and corporate wineries by country

	Australia	Italy	United States	Pooled
Behavioural loyalty	0.22	0.28	0.19	0.23
Attitudinal loyalty	0.36	0.32	0.32	0.32
Satisfaction	0.36	0.37	0.33	0.34
Trust	0.35	0.43	0.27	0.35
Uniqueness	0.37	0.22	0.34	0.30
Social image	0.09	0.11	0.13	0.11
Perceived quality	0.28	0.38	0.28	0.31
Localness	0.52	0.43	0.41	0.44
Corporate social responsibility	0.47	0.37	0.39	0.40
Long-term orientation	0.34	0.29	0.30	0.31
Customer orientation	0.52	0.43	0.46	0.45
Family firm image	2.02	2.21	1.22	1.71

Australia: n=1026; Italy: n=1036; United States: n=1020
Note: Values expressed as Cohen's d (cp. Section 5.2.1.3).

the following models have been estimated for the *cubic* model specification only. The interaction effect of the price and family attributes has- been retained, hence the utility function of the models is equal to the specification defined in equations 5.2 and 5.5. Parameter estimates of the models can be found in appendix A.5, while the majority of results presented in the following are based on further elaboration of these estimates. Figure 6.10 shows the price-utility relationship for an estimation of a two-class model in the three countries. Similar to the earlier elaborations in section 6.1, ordinate values are not directly comparable to one another. The central results of figure 6.10 are represented by the curvature of the utility function. It can be seen that in all countries one class is found to possess a decreasing utility function (over vast parts of the tested price range). The other class in these models is commonly found to possess a different curvature where utility increases throughout parts of the function. Specifically in the Italian and US models it is found that utilities in the first class increase and reach their maximum at a price point in the upper half of the tested price range. For the Australian sample the second class exhibits a curvature similar to the one of the first class of the US sample. However, the maximum utility is reached at a lower relative price point within the chosen

Figure 6.10: Price-Utility relationship for the logistic latent class models



Source: October 2017 survey among regular wine drinkers

Table 6.17: LC estimate of $\overline{\text{WTP}}$ for family attribute

(a) relative monetary units

	Class	
Country	1	2
Australia	7%	38%
Italy	42%	113%
United States	104%	12%

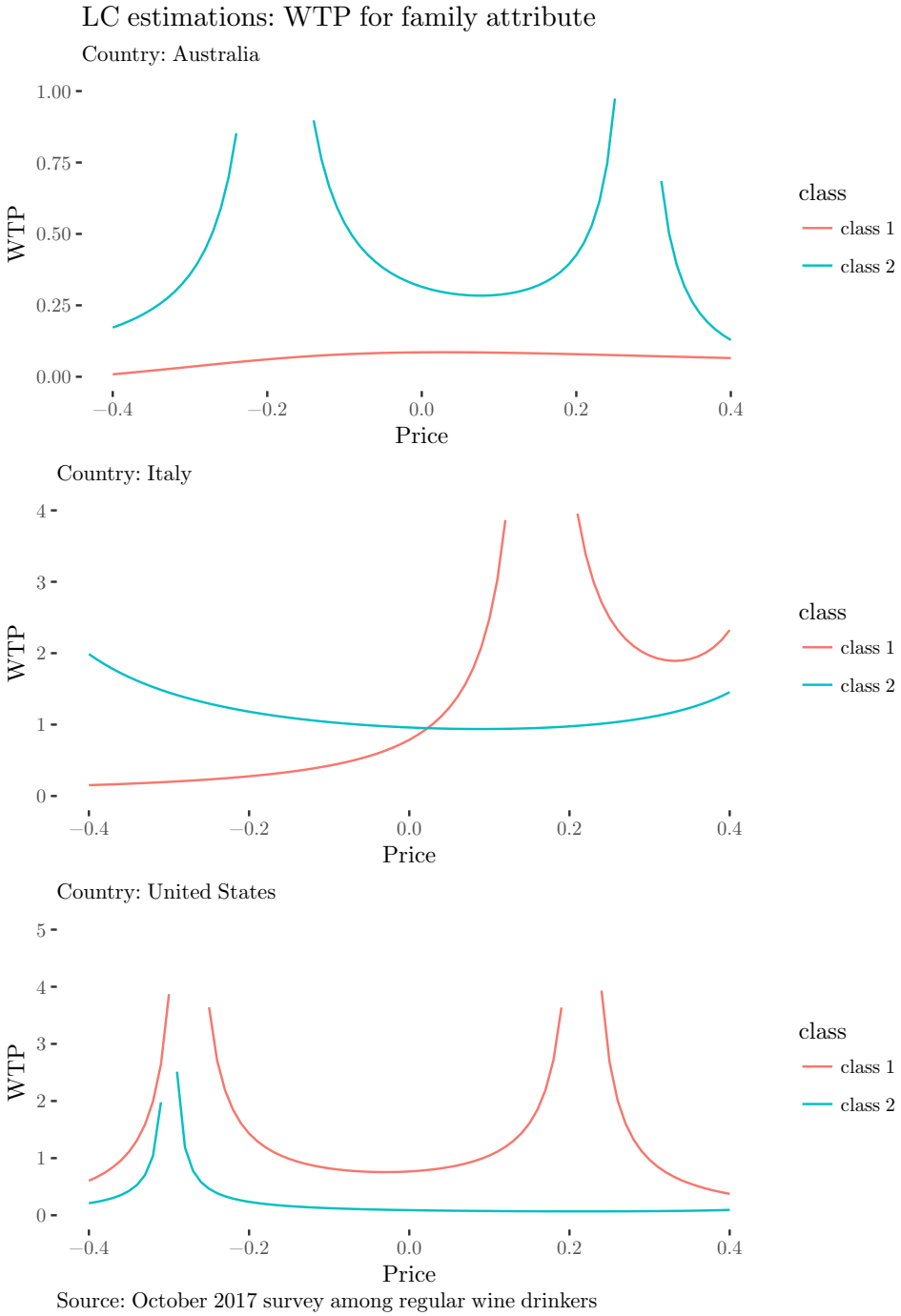
(b) absolute monetary units

	Class	
Country	1	2
Australia	AUD 1.73	AUD 9.53
Italy	EUR 3.18	EUR 8.50
United States	USD 20.36	USD 2.37

range compared to the US sample. Due to the relative character of the utility-price relationship, the willingness to pay for the family attribute has been estimated for the two latent classes across the three countries. Results show that in the Australian sample the second class consistently exhibits a higher willingness to pay than the first class. Similarly, the first class in the US sample exhibits higher values for willingness to pay for the family attribute than the second class. One exception is observed when the willingness to pay of the first class approaches its asymptote. For the Italian sample it is observed that the willingness to pay for the family attribute in the first class is lower than its counterpart in the second class throughout the lower half of the price range. However, in the upper half of the simulated price range the willingness to pay of the first class is higher than the one of the second one. Since estimates of $\overline{\text{WTP}}$ can be compared between classes and countries, further group-wise results can be derived by country. Table 6.17 summarises these estimates of $\overline{\text{WTP}}$ in terms of relative and absolute monetary units. Results show that the willingness to pay clearly differs between the groups across all countries. The lowest absolute[8] and relative willingness to pay is observed for the first class in the Australian sample. The second least willingness to pay, again both in relative and absolute terms, is found for the second class of the US sample. The first class of the Italian sample exhibits the third lowest relative and absolute value of $\overline{\text{WTP}}$. The largest absolute value is observed among the US sample, while the largest relative value is found in the Italian sample. The US and Italian samples rank second in relative and absolute terms, respectively. The Australian sample shows the lowest absolute and relative $\overline{\text{WTP}}$. Table 6.18 summarises the estimates for $\boldsymbol{\gamma}_1$ of the class membership function of the latent class model following the definition of the class membership function as described in

[8]In order to draw this comparison local currencies have been converted to EUR with the exchange rate of 29 October 2018 for the individual preferred model specification.

Figure 6.11: Willingness to pay as a function of price derived from logistic latent class models



Source: October 2017 survey among regular wine drinkers

Table 6.18: Summary of estimates for $\boldsymbol{\gamma}_1$ of class membership function $f(\boldsymbol{Z}_m, \boldsymbol{\gamma}_c)$

	Australia			Italy			United States		
Variable	Est	Se	p	Est	Se	p	Est	Se	p
$\gamma_{0;1}$	−2.12	1.52	0.16	−1.07	0.82	0.19	1.70	0.68	0.01
$\gamma_{\text{age};1}$	0.04	0.02	0.03	−0.13	0.01	0.29	−0.02	0.01	0.01
$\gamma_{\text{income};1}$	0.01	0.06	0.88	0.06	0.94	0.35	0.05	0.05	0.36
$\gamma_{\text{male};1}$	−0.16	0.30	0.59	0.08	0.29	0.80	−0.47	0.25	0.06
$\gamma_{\text{university};1}$	0.64	0.40	0.11	0.04	0.33	0.89	0.24	0.29	0.40
$\gamma_{\text{drinkingfrequency};1}$	−0.08	0.14	0.57	0.03	0.13	0.82	0.00	0.00	0.11
$\gamma_{\text{interest};1}$	−0.54	0.19	0.00	−0.10	0.20	0.62	0.26	0.14	0.06

Australia: n=3949,m=464; Italy: n=4154,m=463; United States: n=4581,m=496

equations 5.102 and 5.103. The findings in table 6.18 are based on the same estimation which has been performed to obtain the results in table 6.17. Estimates for $\boldsymbol{\gamma}_1$ relate to the class membership function $f(\boldsymbol{Z}_m, \boldsymbol{\gamma}_c)$ expressing probability of a respondent belonging to the first out of the two classes of the membership model. Hence, positive parameter estimates indicate a positive effect on the probability of a respondent to belong to the first class.

From the table of results it can be seen, that several variables in $\boldsymbol{Z}_m$ show a significant influence on the probability of class membership. In Australia, age shows such significant effect and positively relates to the probability of an individual to belong to class one. Also income shows a positive relationship with the membership probability of the first class. Finally, wine interest is a highly significant influencing factor of class membership. More specifically, it is found that wine interest is negatively linked to the probability of belonging to class one. In the Italian sample the parameter vector $\boldsymbol{\gamma}_1$ of the class membership function does not contain any significant estimates for the investigated variables, hence no results are reported for this country. The US sample shows several significant effects of the respondents' characteristics on the probability of class membership. First, a significant positive parameter of the alternative specific constant is found. In addition, age exhibits a significant negative influence on class membership probability. At a 6 percent significance level also the male gender dummy exhibits a significant negative effect on the probability of belonging to the first class. Finally, wine interest is found a relevant factor at a 6 percent significance level and positively influences the probability of membership with

class one. As it can be seen from the number of respondents m in the three countries, several participants were excluded compared to the proceeding in earlier parts of the multinomial and mixed logistic models. This stems from the fact that some respondent opted out from individual demographic questions during the survey. To be able to estimate the models, such respondents were excluded from further analysis. This proceeding has led to a reduction of the sample by 43 respondents (8.5%) in Australia, 52 respondents (10.1%) in Italy and 8 respondents (1.6%) in the United States.

Chapter 7

Discussion

Results are discussed in the context of the different analytical procedures employed in this study. Links of findings to further secondary data and prior research that parallels this work are pointed out. Finally, implications of this study are summarised in the light of consumer-based brand equity, agency theory and relevant ongoing developments in the marketplace. Prior to this dedicated discussion of results by research question, a summary in the following paragraphs points out common findings of the study.

Results unambiguously indicate that consumers perceive family wineries significantly different from their non-family counterparts. It is important to highlight that the results presented by two independent methodologies lead to the same consistent findings and hence reinforce the robustness of the conclusions that can be drawn from this analysis. First and most importantly it can be inferred that family firm status and its consumer perception as family firm image are central elements of brand equity in family businesses. This finding is important due to its direct implications on businesses models and modes of operation linked to these attributes. The quantitative evidence provided in this study is of high relevance for the wine industry as it creates value from a consumer point of view. Different methods to provide an economic quantification of the related effects are discussed in section 7.1. The overall creation of value for consumers can be observed in any country. This is an important indication that independently from local culture, the family firm image in the wine sector is unambiguously linked to positive attributes across the countries. However, different chains of effects are observed between the countries and adaptations from an organisational and communication point of view are required (cp.

section 7.2). The implications these findings have on the industry and related policies are discussed in section 7.4.

7.1 Research question 1

7.1.1 Contribution of the model

The logistic models contribute in different ways to the scholarly knowledge in the field. To the author's best knowledge, this study estimates the willingness to pay for wines produced by family wineries for the first time in scholarly work. The multi-country character of the study establishes vast cultural independence of results and additional generates evidence of their validity. The estimation process of these results has shown particularities due to the price-utility relationship in the Italian sample. It has been found that a linear price-utility function does generally not hold and can severely bias the results of models in certain situations, which is further evidence in favour of Sennhauser's (2010) appeal to caution when defining the analytical specification of utility functions. Different approaches to deal with modelling non-linearities in data have been presented and compared with each other. In addition, different model specifications, such as estimation of multinomial logistic models, logistic mixture models, as well as model estimation in preference space and willingness to pay space, have been carried out. In addition, no previous work has modelled interaction effects between product price and the family attribute in the wine product category. Due to the significance of the family attribute, further investigation of the antecedents of this price premium paid by consumers is well-justified (see discussion in section 7.2).

7.1.2 Willingness to pay

The study finds family firm status to affect product sales in all countries. Research question 1 can hence be answered in the affirmative. However, the size of this effect shows variability in its extent across the different countries. The results of the univariate analysis (cp. figure 6.4) identify the family attribute to consistently rank third across a uniform set of attributes. The overall high importance is confirmed through the multivariate analysis for the Italian and the US sample, while among Australian

respondents of the study the family firm attribute shows the least relative importance as the multivariate analysis shows.

According to equation 5.25, willingness to pay for the family attribute is driven by three effects in the logistic models. These are the effect of the family attribute on the utility function, the effect of the price attribute on utility and the interaction effect of these two attributes. In the logistic mixture model the interaction effect has been omitted[1].

A comparison of the logistic models and logistic mixture models shows that the use of logistic mixture models considerably increase the explained variance, which can be seen when comparing the $\bar{\rho}^2$ measure of the logistic models (appendix A.3) with the results of the logistic mixture models (appendix A.4) and also when using the information criteria in tables A.5 and A.6[2]. At the same time it is observed that estimates of the dispersion parameter $\boldsymbol{\theta}$ of the mixing distribution are largely highly significant. This implies that despite a clear trend for the population can be identified, heterogeneity among respondents in the countries exists.

It is found that model specifications that extend a linear approach add further explanatory value to the data and provide better estimates of willingness to pay. This can be particularly seen from the results that have been obtained for the Italian sample. Data of the Italian sample are a case in point of how non-linearity in the data can influence the estimation when solely relying on a linear model specification. A further means to ensure the robustness of the estimation has been the use of different model types. First, logistic models have been used to estimate the model specifications assuming homogeneity of consumer choice. A subsequent second approach using logistic mixture models relaxes this assumed heterogeneity among respondents and takes a longitudinal approach in estimating the data and includes random parameters as well. Two estimations, once in preference space and once in willingness-to-pay space add further robustness to the results.

The first and most general finding is that in any of the models the significance of the family attribute was confirmed. However, differences exist among countries. Compared to the other tested attributes, the relative importance of the family attribute has been found

[1] The reasoning behind this omission is motivated to ensure finite moments of the analytical specification of the willingness to pay estimator in presence of random variables in a logistic model (Daly et al. 2012).

[2] Since multinomial logistic and logistic mixture models are no nested models, likelihood ratio tests cannot be employed to compare model goodness-of-fit (cp. Hess 2005, 82).

to be the least important among the sample of Australian consumers. The US sample shows the highest valuation of the family attribute compared to the other attributes which have been tested in the choice experiment. At the same time US consumers also showed the highest sensitivity to price in the sample, while Italian consumers were found the least price sensitive. In their interplay, both variables influence the willingness to pay for the family attribute[3]. Tables 6.4, 6.6 and 6.7 show that the vast differences for the willingness to pay for the Italian sample decreases once it is expressed in monetary units. Further, the tables show that the logistic mixture specification without interactions provides lower estimates than the multinomial logistic model in the case of Italy. An outlier of the estimate can still be observed for all linear models for the Italian sample. It further becomes clear that the high relative willingness to pay for Italy shown in tables 6.3 and 6.5 is closely linked to the choice of low reference price levels in Italy (cp. table 4.1). This fact also explains why the estimated price-utility functions in figures 6.5 and 6.6 show a different progression in comparison to the estimated one for Australia and the United States. Although all price levels derive from quantitative data by Euromonitor International (2017*a*,*b*,*c*) and have been determined using a singular methodology, it appears that the price levels for Italy may be perceived relatively lower by respondents in Italy than the ones in the other two countries for the given occasion. Nonetheless, through allowing for non-linear price-utility effects this particularity could be successfully addressed through higher order models which generate economically reasonable estimates for $\overline{\text{WTP}}$ in Italy.

7.1.3 Non-linear price-utility relationship

This point leads to a further important finding to be discussed: the non-linear price-utility relationship. It is important to underline that econometric literature largely assumes a

[3]Closely linked to this is the willingness to pay at different price points as shown in figures 6.7 and 6.8. The changes in willingness to pay that appear to be markedly across different price points do not emanate from vast changes of the marginal utility of the family attribute (equation 5.21) but originate when the marginal price utility approaches its zero set (equation 5.22). This means that WTP increases for any of the attributes due to the analytical definition of the indicator. The assumption of an infinite willingness to pay for an attribute may however not mirror what will be observed in a real decision at the price point where equation 5.22 approaches its zero set and is rather to be seen as a structural condition of the non-linear model specification. By definition the indicator $\overline{\text{WTP}}$ omits any related bias through being a ratio of averages rather than an average of ratios (cp. equation 5.28).

strictly negative marginal utility of price. This theoretic angle is by far the most commonly adopted view in economic literature and in related work about discrete choice modelling. While little objections exist about the implementation of non-linear effects in models from an analytical point of view (Hess 2005, Osborne 2014), their theoretic justification appears to be less common and hence such effects are often not implemented in econometric models in the field of discrete choice analysis. However, advances in research, such as Völckner (2008), provide evidence that price exercises distinct effects on consumers. The author argues that consumers may use price as an indicator of quality in situations when quality evaluation of a product is uncertain. This effect may be particularly observed in the given choice situation chosen in this research, when people were asked to choose wine for a special occasion (i.e. diminishing marginal utilities and gain-loss asymmetries, Hoyos 2010). Further effects are related to the price variable, such as prestige effects or hedonistic effects. It may be argued that non-linear relationships are more likely to be found for certain product categories and may vary by occasion (cp. section 2.2.2). For instance, it can be assumed that for highly standardised products, such as commodities, a linear decreasing relationship of price and utility may be appropriate. This hypothesis is derived from the assumption that quality evaluation of homogeneous product categories is simple and little risk from a consumer point of view exists as the high degree of standardisation ensures a comparable quality. Contrary, for wine, research has shown that price can be a proxy of product quality (Oczkowski and Doucouliagos 2015), which consumers take into account in their choice process. As the intrinsic value of wine is multifarious and difficult to assess (cp. section 2.2.2), allowing for a non-linear price utility relationship is important in order to derive reasonable estimates. This necessity is exemplified through comparison of the linear and the higher order models for the Italian sample. The relevance of such signalling effects is likely to have increased through defining the choice task in the context of a special occasion. The finding has important implications for portfolio decisions of businesses as well. Since the marginal utility of the price attribute is not constant, businesses can benefit from adjusting their portfolio according to these observed choice pattern, i.e. producing wines with dedicated quality in a given price segment. While these non-linearities have been observed in any country, it remains to be seen whether the observed price-related utility maxima are anchored in an absolute context or vary relatively based on a set of given alternatives.

These findings further imply that the choice of the price interval in the choice experiment

represents a crucial aspect. Observed non-linearities may be a cause of skewed estimates, particularly if the price interval is chosen inappropriately. In such situation the use of non-linear model specifications can offer an effective solution to overcome this related problem. From a technical perspective it could be seen that difficulties arise when adopting non-linear specifications of the utility function, especially for price- or cost-related variables. However, such difficulties can be addressed accordingly. Hence an estimation of willingness to pay is possible and leads to estimates comparable to the ones of linear model specifications, unless severe non-linearities occur.

7.1.4 Experimental choice and observed choice

Since the study provides evidence that the family queue matters for consumers, it is important to discuss these findings further and investigate how they translate into observed consumer choice. It is important to highlight that experimental results may not be observed in actual consumer behaviour in exactly the same way as they appear from this study. Similarly, estimates of willingness to pay may not be interpreted at face value. It may not hold true that consumers in a shopping scenario will by default chose wine from a family business as long as the price premium for this wine is less than the willingness to pay for the family attribute. One explanation, which is embedded in the model may be that the given (available) alternative has a lower utility for a consumer which is caused by other attributes than the family attribute. Another cause not shown in the model is related to budget restrictions that may apply in a given shopping scenario. Individuals will then maximise their utility $U(\boldsymbol{x})$ within their budget constrain $x_{\text{pri}} \leq x_{\text{pri\_max}}$. Sometimes this budget constrain is even more restricted and not only a ceiling price but also a floor price exists, so that $x_{\text{pri\_min}} \leq x_{\text{pri}} \leq x_{\text{pri\_max}}$. This is to say that a wine produced by a family winery could maximise the total utility of an individual but cannot be chosen due to these restrictions. This fact is highly relevant for shopping scenarios as wine from family wineries within a given price range or at a given point of purchase may not be available. The influence of availability on the decision whether consumers purchase wine from a family winery or corporate winery can be implicitly derived from figure 6.1. According to the findings shown in the chart this holds particularly true for Australia and Italy where vast differences between the two business types can be observed and consumers in supermarkets may not be able to take into account wine from family wineries

in their actual purchase process due to a lack of alternatives at the point of purchase. Further, this research has not identified how different ways of communicating family identity do affect consumer choice of wine. While it has been an important finding that the family attribute is a meaningful driver of wine choice, further research is required in order to understand differential effects of the communication of family firm identity. This aspect is important given the fact that consumers take only few seconds when choosing products in retail, such as supermarkets (Dickson and Sawyer 1990). As it has been shown in figure 6.1, supermarkets and bottle shops can be considered important retail channels for family businesses in the wine sector. In such situations label information may be the only cue which can be actively controlled by a business and at the same time the only existing cue for consumers to obtain information about a wine. In such situations previous studies have shown that label information can affect consumer choice (Jarvis et al. 2010, Mueller, Lockshin, Saltman and Blanford 2010). However, recent evidence by Gallucci et al. (2015) suggests branding at a corporate level to be more effective than branding at a product level[4]. It remains to be seen how effective in-store branding strategies at business level may be applied in the best way. Other channels, such as the strongly growing electronic commerce with its manifold business models, may possess an inherent advantage in delivering a more holistic presentation of a business at a firm level. Subsequent investigations of the family firm queue are further required in on-trade situations, such as when wine is recommended by restaurant staff or is chosen from restaurant wine lists (cp. Corsi et al. 2012). From the results of this study it can be seen that in choice situations the family nature of a business is a relevant attribute, but an efficient communication of this attribute is of high importance.

[4]Issues related to corporate and product branding were avoided in the research design by presenting the actual true family or corporate nature of a company rather than a specific branding strategy at a company or product level in the discrete choice models. In the structural models issues have been avoided by referring to past purchases from both specific firm types.

Table 7.1: Wine consumption and import (mhL) by country (2016)

	Consumption	Import	Import share
Australia	5.4	1.5	28%
Italy	22.5	1.7	8%
United States	31.8	11.1	35%

Source: Author's calculation based on OIV (2017) and United Nations (2018) data for calendar year 2016

7.1.5 Digression: home country origin

When comparing the relative importance of attributes, origin is the most important attribute in Australia and Italy. Particularly among Italian and Australian respondents the relative importance of origin is about 54 and 35 percent, respectively, while it is only 20 percent in the United States. A closer look at the estimated model coefficients in appendix A.3 shows that especially the attribute level for domestic origin (i.e. Australia in the Australian sample and Italy in the Italian sample) represents the largest coefficient of the origin attribute in these two countries. This fact hints that a strong home-country bias exists among respondents and may be owed to the long wine-growing tradition in both Italy and Australia, while in the United States wine growing is less considered a part of the national identity and only subordinate country effects exist. These results are in line with recent global trade data that identify the United States to be the world's largest wine importing country in terms of value and the third largest in terms of volume (International Organisation of Vine and Wine 2017). A comparison of table 7.1 and the stated importance of home country origin in the individual countries shows a clear pattern between the imported share of wine and the preference of domestically produced wine in the choice experiment. Italy by far shows the strongest penalisation of non-Italian wine and is also the country importing the least wine. The United States exhibiting the highest share of import wine consumption, show the weakest preference of domestic wine in the choice experiment. Although cause and effect cannot be inferred from these data, the overlap of reported preferences in the choice experiment and actual behaviour revealed in trade data adds to the validity of the experimental findings.

7.2 Research question 2

7.2.1 Contribution of the model

By combining the family firm image scale of Beck and Kenning (2015) with the approach to distinguish businesses by their family firm status[5] (Binz et al. 2013), this research tests a question which has never been tested in the wine sector before: *Are family wineries perceived differently than their non family counterparts?* Since consumers represent the most fundamental stakeholder group of a business, which ultimately constitutes a firm's reason for being in the marketplace, it is meaningful to investigate their perceptions. For the further proceeding of the analysis it has been important to show that a significant relationship between actual family firm status and the chosen psychometric scale of family firm image exists. Such differential in the perception of both firm types is important as it constitutes the precondition that family firm image can be a strategic resource of a business. The multivariate approach adds further weight to these earlier studies, which assumed that such differential perception exists.

However, this study takes a different angle than the referenced research by embedding these variables, such as family image of a business, in a more general marketing framework, which has been established earlier by authors such as Chaudhuri and Holbrook (2001) and applied with slight adaptations in a more wine-specific context by Bianchi et al. (2014). While both studies implement measures of brand loyalty and brand relationship in their framework, distinctive elements of brand image are still lacking. Also Beck and Kenning indirectly point this out as they remain cautious about the antecedents of the identified relationships. In this regard, Anselmsson et al. (2014) have proposed a comprehensive set of distinctive brand image elements, which show vast similarities with the distinctive characteristics of family firms that have been identified by a recent review of past research in the field by Sageder et al. (2018). Intersecting elements of previous studies have been introduced in the model to further investigate not only the whether but also how family firm image influences key variables that ultimately lead to consumer loyalty. Through this additional layer in the conceptual model, the study can draw a more detailed picture, of (1) how family firm image influences key brand image elements and (2) how these brand

[5]It is here referred to the variable of family firm status, which is a binary variable that carries the information whether a winery *is* a family firm or not.

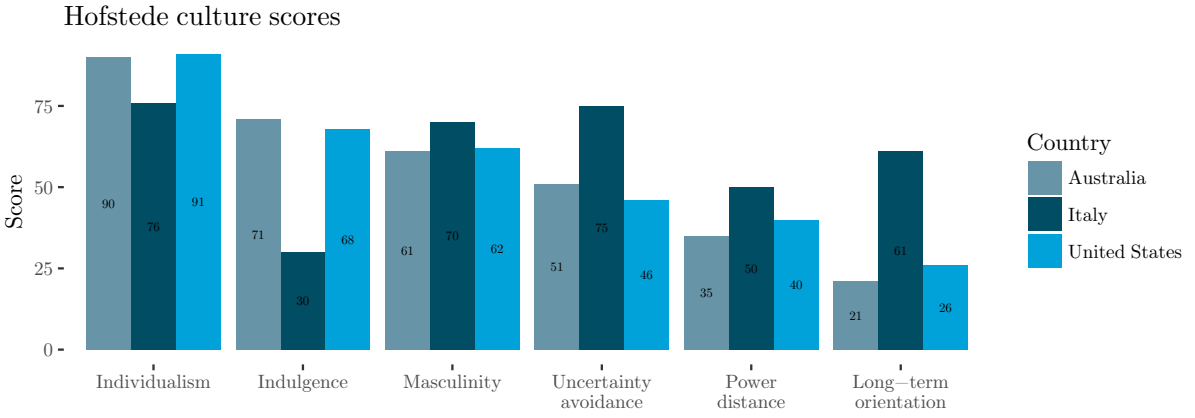
image elements influence brand relationship. These both steps constitute the central novel element the model contributes to the current knowledge. The relationship between brand knowledge and brand loyalty is well-established in marketing research, however has not been investigated in the wine sector using a dual conceptualisation of brand loyalty (cp. Bianchi et al. 2014). The investigation of this joint framework across Old and New World wine countries adds further weight to the general validity of the model.

7.2.2 Path coefficients

7.2.2.1 Behavioural outcomes and brand relationship

Behavioural outcomes represent the final indication whether the family nature of firms can constitute an economically valuable resource in the marketplace. It is important to underline in the first place that the model confirms the findings of previous studies that find a direct link between brand relationship and behavioural outcomes. At the same time, significant differences are found at a country level for this link between behavioural outcomes and brand relationship. From the results in table 6.14 it can be seen that differences mainly constitute between the Old World and New World countries. In this regard it is seen that the Italian sample attributes the highest importance to the effect of brand trust on attitudinal loyalty and the least importance to the effect of brand satisfaction on this variable. These findings appear in line with hypothesised relationships from earlier research in the food space that implies a strong link of Old World consumers to traditional production processes and designations of origin, which create trust (Kehagia et al. 2007). However, these findings are in contrast to the results of Jin et al. (2008), who conducted a comparison between two countries, which have been classified as high-trust (United States) and low-trust (South Korea) societies. The authors argue that (south) Italy can be understood a low-trust society. When applying this reasoning to the dataset of this study, the relationship appears inverted. These differences are not surprising as the research of Jin et al. (2008) and this study investigate different topics (e-commerce vs. family firms in the wine sector), originate from different countries (South Korea vs. Italy) and use different concepts of loyalty (one loyalty construct vs. two distinct measures of loyalty). For this reason, the conditions of direct comparability of

Figure 7.1: Culture scores for countries in sample



Source: Hofstede et al. (2010)

the results of this study with Jin et al. (2008) are not given[6]. However, when comparing the findings of this study with Forgas-Coll et al. (2012) who conducted a tourism-related study between Italian and US consumers using a framework comparable to this study, i.e. including two measurements of loyalty, the authors find a stronger relationship of satisfaction and attitudinal loyalty for the US compared to the Italian sample. In a further study of business relationships by Wallenburg et al. (2011) in Germany, a country with high uncertainty avoidance[7], and the United States, a country with low uncertainty avoidance, it is found that the effect of trust on loyalty is significantly higher in the German sample. In the following it will be shown that these findings of Forgas-Coll et al. (2012) and Wallenburg et al. (2011) are in line with the results of this study. In the light of this discussion it becomes obvious that little cross-national research exists in order to compare these findings. Despite the limited existing knowledge of pattern details, no doubt exists that marked differences between countries prevail. Evidence shows that these differences are likely to follow a pattern influenced by national culture. When comparing the countries in their sample, Forgas-Coll et al. (2012) refer to the six different dimensions that originate from research in organisational cultures by Hofstede et al. (2010). These dimensions can also be translated to the context of nations (Hofstede 2011). Figure

[6]It may further be noted that the use of cultural dimensions in Jin et al. (2008) has been subject to criticism (cp. Brewer and Venaik 2012).

[7]The Hofstede et al. (2010) framework which contains the dimension of uncertainty avoidance is introduced in the following sentences.

7.1 illustrates the scores of the six dimensions for the three countries of this study. The dimension of uncertainty avoidance measures the extend to which a culture's members feel uncomfortable in unstructured situations (Hofstede 2011). In this regard it can be argued that "trust reduces the uncertainty in an environment in which consumers feel especially vulnerable" (Chaudhuri and Holbrook 2001, 82). In addition, Forgas-Coll et al. (2012) argue that the elevated importance of the satisfaction-loyalty relationship may further be caused by a higher cultural individualism, which vocalises as quest for self-satisfaction and experience of pleasure in consumers. When comparing the coefficients of the relationship of brand trust and attitudinal loyalty in table 6.14 with the Hofstede et al. (2010) culture scores in figure 7.1 between the countries, a clear correlation between the three countries is observed. Hence, the above interpretations can be supported by the findings of this study, however further replication in different cultural settings is required to investigate correlations of the model path coefficients with the cultural dimensions of Hofstede et al. (2010). Nevertheless, the compliance of the findings with Forgas-Coll et al. (2012) and Wallenburg et al. (2011) leads to assume that the differences in national culture are a major cause of the significant differences of the observed coefficients in the trust-loyalty and trust-satisfaction relationships. While the above discussion has started at a great level of detail, it is also important to highlight that the central hypothesised effect of a positive directional relationship between the individual variables of brand knowledge and behavioural outcomes is confirmed in all three countries. Hence, a first and central element of the theoretical framework is confirmed.

7.2.2.2 Brand knowledge

Several particularities were found between Old World and New World countries for path coefficients of brand knowledge and brand relationship variables. One first difference that can be observed is the relationship of uniqueness and brand satisfaction. It is found that a significant (positive) effect is found only for the samples in Italy and the United States. Ruvio (2008) argue that uniqueness is a desirable social attribute in western cultures, particularly in the United States, due to its connotation to freedom, independence and self-expression. For these reasons, the findings in Italy and the United States are in line with these expectations. However, the lack of significance of this effect in Australia cannot be explained by this reasoning and further investigation is required why the individual

path coefficient did not show any significance.

As a further latent variable social image expresses the degree to which a product is perceived to have high social desirability. A positive effect of social image on brand trust is only observed in Italy, while in Australia and the United States none or a negative effect is observed. These differential findings can be matched to the dimension of individualism in figure 7.1, which is higher both for Australia and the United States. It can be established, that cultures with lower degrees individualism may gain additional trust from the fact that a business has a high social image (cp. Shukla 2010).

The perception of perceived quality is different between the countries. While the path coefficients are highly significant and positive in all countries, the Italian sample exhibits the lowest path coefficients for the brand trust and brand satisfaction relationships, respectively. While quality is important in all countries, respondents in the Italian sample attribute less weight to its influence on both downstream variables. This aspect may be an expression of the high sophistication of Italian consumers, which assess quality though a wider spectrum of attributes to infer brand trust and satisfaction. Beckert et al. (2017) make a point that in affluent consumer societies, which are characterised by the fact that functional needs are mostly satisfied, value derives from more cues than plain tangible product characteristics. This can be particularly seen, when comparing the following two constructs of localness and long-term orientation.

The Italian sample shows the strongest association between localness and brand satisfaction. This finding coincides with related literature in the food space highlighting the "deep cultural value of Italian gastronomy and of regional peasant traditions" (Sassatelli and Scott 2001, 224) in Italian society. This focus on local traditions constitutes a very important part of Italian culture and local identity (Fonte 2008). Further, the results confirm earlier research by Stefani et al. (2006) who find that narrower and more precisely defined areas of origin positively affect the preference and willingness to pay of Italian consumers. Following the definition of the localness construct, it is expected that Italians prefer local produce over imported produce, for instance due to the deep cultural value associated with this variable (Sassatelli and Scott 2001), and hence are less likely to consume imported wine. The validity of this relationship can be established from the data by the fact that Italy is the country with the smallest share of imported wine among the samples according to the trade data shown in table 7.1. Localness is further frequently associated with highly integrated short supply chains with high traceability, which creates

trust and added value for consumers (Feldmann and Hamm 2015). The appreciation of local products has been found to be the highest among Old World countries in this research. Similarly, earlier studies have found that consumers in other Old World countries, such as Germany, show a high appreciation of local food systems (Roosen et al. 2012). Hence, a transferability of these results to other Old World countries is likely. Research further indicates that in the food sector localness may even be considered as an alternative to organic food claims. This context is important to consider, particularly due to the commoditisation of organic products and the emerging debate about local food production and consumption, which is born out of this critique and has led to the development of post-organic movements among producers (Fonte 2008). Adams and Salois point out that "before the federal organic standards, organic food was linked to small farms, animal welfare, deep sustainability, community support and many other factors that are not associated with most organic foods today" (Adams and Salois 2010, 1). Further, viticulture-specific inherent concerns of practices in organic wine production exist[8]. It is argued that the recent developments in the organic food sector have caused a shift in consumer preference away from organic towards local food (Adams and Salois 2010). Recent research confirms these results and finds strong substitution effects between local and organic food (Meas et al. 2014). The authors further highlight that the actual motivation of consumers to purchase local or organic products is the aim to support small or family-owned farms. This research provides further evidence for the perspective by showing that consumers perceive localness of family wineries significantly higher than they perceive it for corporate wineries.

It is further found that differences between Old and New World countries have also been observed with respect to the variable of long-term orientation. It is found that the effect of long-term orientation on brand trust and brand satisfaction significantly differs between the countries. The positive link between a long-term orientation and brand trust has been found earlier in related research among Italian consumers in the food sector (Kehagia et al. 2007). More importantly, parallels for this observation can be found in the dimension long-term orientation of Hofstede et al. (2010). The representation in figure 7.1 shows a double to threefold score for Italy compared to the US and Australia. The path

[8] As the discussion of technical practices and their environmental impact is not essentially linked with consumer research, no further discussion is carried out in this work. Readers may consult related literature, such as Ballabio et al. (2018) for a comprehensive analysis of the situation in Europe.

coefficient estimates of the structural equation model in table 6.14 exactly mirror this relationship between the countries: While long-term orientation is considered important for Italian consumers to develop trust, no such effect is observed among respondents in the other two groups. More importantly, in both Anglo-Saxon countries long-term orientation is negatively related to brand satisfaction. In this regard, it becomes apparent that in these countries long-term orientation may merely be related to an image of stasis and old-fashioned practices that do not address contemporary consumer needs. However, in Italy long-term orientation is significantly positively linked to brand trust and satisfaction. This observation is also in line with Kehagia et al. (2007), finding that traditional processes provide trust to Italian consumers. These differential findings between the three countries are important to highlight as they reveal that the perception of a given attribute may correlate closely with the local culture of a country and have differential implications for a business marketing its products in a given cultural context.

Corporate social responsibility is found to be positively related to the formation of trust in all countries and no differences could be detected between countries ($p_{\chi^2_{\text{diff}}} = .12$). This is an indication that corporate social responsibility is considered a relevant means of developing trust in all countries, and hence important influencing variable of downstream relationships. However, the effect of corporate social responsibility on satisfaction is mixed. In Australia and Italy no significant relationship between the variables can be observed, while a positive association is found for the US sample. Hence, corporate social responsibility may not per se provide satisfaction to consumers, but is a means of developing trust in a brand. This finding is relevant as it provides an understanding in the mechanistic relationship of this variable. In summary, it may further be concluded that corporate social responsibility is an aspect which can be considered to be of higher importance in the US due to its significant effect on both brand trust and brand satisfaction, while in the Australian sample it is a central means of trust. In Italy, corporate social responsibility, despite its significance is found to have the lowest and only partially significant path coefficients for these downstream relationships.

Customer orientation has been found an important attribute. Its significant effect on trust could be established across all three countries without any differences in effect size being detected between the countries. Its importance is central and can be a decisive aspect for family firms, particularly considering that a significantly higher share of wine sales takes place at the cellar door in family wineries (cp. figure 6.1). However, for the

effect of customer orientation on brand satisfaction it is found that only in the Australian and the Italian sample a positive and significant relationship between the variables can be established. Among US respondents no positive path coefficient between both variables is found. This finding appears interesting in the light that in the US cellar door sales for family wineries only represent a very small share of sales (2 percent), while in Australia and Italy consumers bought wine from family wineries directly at the cellar door 27 and 51 percent of the time, respectively. Although these effects may also be caused by the geographic proximity of wineries and consumers in Italy and Australia, it could also be possible that cellar door sales of these businesses are driven by this effect as consumers assign value to customer service, and family firms are scoring significantly higher in this dimension. However, inference whether customer orientation is immediately driving cellar door sales of family wineries (figure 6.1) cannot be established using the given dataset by design. Still, it can be stated that customer orientation is a relevant antecedent of brand satisfaction in Australia and Italy. In line with previous findings of Binz et al. (2013), this relationship provides a strong opportunity for family firms to demonstrate their customer orientation by personally engaging with their customers and hence generating added value for this key stakeholder group.

A further central finding of this research are the relationships of family firm image and the set of brand knowledge variables. In all countries and for all relationships between family firm image and the variables of brand knowledge a significant positive effect could be observed. This finding confirms that family firms possess a significantly different identity than their non-family counterparts from a customer point of view. Family wineries have been found to rank higher in any given dimension of brand knowledge. This contribution is important as past research has focused mainly on organisational characteristics of family businesses (Zellweger et al. 2010) and few research about the perception of family firms from a consumer point of view exists (Carrigan and Buckley 2008). The results of this work unambiguously show that consumers maintain distinct perceptions of family firms, which opens an opportunity for businesses to leverage this distinctiveness. It has also been ensured from a methodologic point of view that the differential perception of family firm image actually originates in family firm status. This additional covariate provides evidence of model validity.

From a more general perspective findings help understanding why differential perceptions of family firms exist in the literature (Carrigan and Buckley 2008). The structural model

is able to give an insight into the mechanistic relationships that induce these effects. For instance, it is important to understand that not only Italian, but also Australian and US consumers consider family businesses to be more long-term orientated than their non-family counterparts. An approach to infer the preferability of a family business solely based on the individual brand image elements would provide biased results as it can be seen that downstream relationships (i.e. brand knowledge → brand relationship) are subject to cultural influences and need to be attributed in any model drawing conclusions about behavioural outcomes. Although cultural connotation of attributes linked to family firms exhibit heterogeneity, the results of this research also indicate that many effects are vastly similar with respect to their directionality. For this reason, it can be summarised that the effect of family firm image on brand image elements (i.e. individual constructs of brand knowledge) is perceived in a very similar way. This finding constitutes that family firms *possess* a distinctive identity and are perceived differently from their non-family counterparts. However, the cultural dimension comes into play when this distinctive identity is *interpreted* in a social context and conclusions about the preferability of family firms are drawn. Hence, when drawing conclusions about the identity of family firms and its implications on consumer behaviour, it is important to analyse the complete chain of effects as it has been modelled in this study.

7.2.3 Latent means

Latent mean analysis is applied to analyse the differential consumers perceive between family and corporate wineries for each latent variable. The finding that family firm image ranks first regarding between-group differences is an expected result, which provides evidence for the quality of the data and suitability of the research design because the construct of family firm image is strongly linked to family firm status of a business by definition. The fact that consumers clearly differentiate family businesses from their non-family counterparts also indicates that marked differences between these types of business are perceived. Further markedly distinctive elements are customer orientation, localness and corporate social responsibility. These findings align with the results of the prior univariate analysis of scale items (cp. figure 6.9). While these items have shown to be the most different between family and corporate wineries, not all latent variables ultimately influence consumer choice. The most evident example among these

variables is the localness construct. While localness ranks either second or third in all countries with respect to actual perceived differences, it shows only a relatively weak effect on a single brand relationship variable among US consumers. Also the rank of these between-group differences differ by country. For instance, while corporate social responsibility ranks among the four most different attributes (according to the pooled sample), it ranks only sixth in the Italian sample and only significantly influences one of the brand relationship variables in this country. Other brand knowledge variables, such as customer orientation and localness are more important discriminants in the pooled sample. Respondents have stated less marked differences between the firm groups for other variables, such as uniqueness and social image. Further variables, such as perceived quality show intermediary discriminative power, but strongly affect behavioural outcomes through their strong link with brand relationship variables. Marked differences for this variable exist between countries since differences for perceived quality rank fifth in the Italian sample while they only rank tenth and ninth in the Australian and United States samples, respectively[9]. Also constructs of brand relationship differ between the countries. This particularly applies to the perception of the brand trust construct, which ranks second in the Italian sample and is found only on ranks eight and ten in the Australian and US samples, respectively. From the analysis of path coefficients it is known that particularly in the Italian sample trust plays an important role, which can hence be considered a key advantage of family firms. When finally investigating behavioural outcomes, Cohen's d is found to be consistently more marked for attitudinal loyalty that it is found for behavioural loyalty. This finding implies that despite differences are observed for both attitudinal and behavioural loyalty, the effect size of attitudinal loyalty is 43 percent larger than the effect size of behavioural loyalty on average. Differences can also be observed between the countries: Effect sizes are 63 and 64 percent larger in the Australian and US sample, while Cohen's d is only 15 percent larger in the Italian sample. However, this observation in the Italian sample originates not exclusively from a smaller d value of attitudinal loyalty, but also from the fact that the differential of behavioural loyalty between family and non-family firms in Italy is larger than in the other countries.

[9]It is likely that the heterogeneity of perceived product quality between the countries is caused by a markedly different structure of the wine industry between Old and New World countries.

7.3 Research question 3

Significant effects of respondent characteristics on class membership are constituted in two out of three countries. However, groups in each country differ in the associated willingness to pay for the family attribute. The Australian and US samples share several similarities with respect to the observed effects of respondent characteristics on the class membership function. This particularly applies to the influence of respondent age and wine interest. In both countries the degree of wine interest of an individual is positively linked to the probability of belonging to the class with higher willingness to pay for the family winery attribute. The class which exhibits a higher willingness to pay for the family attribute in the Australian and US samples shows to be less sensitive to price. Further, it may be argued that this group of consumers may show a stronger appreciation of the symbolic value of the family cue (cp. section 2.2.2). It can hence be assumed that this groups of consumers may be considered as connoisseurs which obtain a high utility from the family firm attribute. Terrien and Steichen (2008) argue that such consumers gain utility through the differentiation effect the presence of a relevant attribute adds to a given wine. While the willingness to pay is consistently higher in these countries, the Italian sample exhibits a differential behaviour. The first class of consumers may be considered the group of connoisseurs since their utility increases with higher prices. This is to say that these consumers obtain little utility from purchasing wine at a low price point (cp. figure 6.10). This low overall utility also mirrors in a low utility of the family attribute at these price points. This relationship may on the first look be misleading when interpreting the findings presented in table 6.17. A closer analysis of figure 6.11 shows that at a high price range respondents obtain a higher utility than at any price point in class 2. However, it is also important to say that Italian consumers greatly value the family attribute even at lower price points. This can be seen from the fact that the relative willingness to pay of the (on average) lower class 1 is higher than in any class in the Australian sample. This reinforces earlier findings regarding the overall importance of the family attribute (research question 1) in the Italian sample. Age of respondents has also been found to significantly affect group membership probabilities. It appears that a lower age of respondents increases the propensity to belong to the group with a higher willingness to pay for the family attribute while controlling for all other socio-economic variables. Krystallis and Chryssohoidis (2005) have found earlier that younger

consumers exhibit a higher willingness to pay for organic food and attribute this effect to a higher environmental consciousness. Better production practices, such as sustainability and long-term orientation, in family firms have been confirmed earlier as a part of research question 2. More specifically, Teagle et al. (2010) have shown among multiple data sets of Australian wine consumers that younger generations, such as Millennials, generally exhibit a higher willingness to pay for wine compared to older generations, such as Baby Boomers. Although findings of this study are the same for Australia and the United States, Atkin and Thach (2012) have reported differing findings in the US market. However, these differential findings may most likely emanate from the multivariate approach taken in this research. This study controls for a multitude of factors which themselves correlate with age. For instance, age is correlated with disposable income and experience with the wine category. These two variables may be likely to take lower scores in younger consumers and hence the univariate results reported by Atkin and Thach (2012) are likely to differ from the multivariate ones presented by this research. One further significant variable adding to the results of the US sample is the gender of respondents. From the analysis it is seen that women are more likely to fall into the second class, which shows a higher willingness to pay for the family attribute. In this regard a growing body of research, such as Grunert et al. (2014) and Vecchio and Annunziata (2015), finds that female consumers show a higher concern about sustainable production of food products and exhibit a higher associated willingness to pay for related attributes. Since it is known that family firms are associated with a higher perceived long-term orientation, parallels may be drawn that this higher concern for sustainability may be one of the factors that contributes to the premium paid by these consumers. These effects are however not confirmed in any other country. While the effect of the coefficients mentioned above have a clear interpretation, significance of the alternative specific constant $\gamma_{0;1}$ is less intuitive to interpret. Particularly since the vector $\boldsymbol{Z}_m$ is not centred or standardised, any further discussion of $\gamma_{0;1}$ is not feasible.

Summing up the results of the segmentation study, it is found that clear population heterogeneity with respect to the willingness to pay for the family attribute exists across all three countries. It is further found that several variables can explain class membership probabilities in two countries. However, it is clearly seen that traditional socio-demographic characteristics, such as income or higher education, do not explain class membership and the price premia associated with the family attribute. However, wine interest, which

is not a classic demographic variable and much more category-specific, provides a good propensity to explain differences in class membership. Due to its nature this variable also bears direct strategic implications for family firms regarding their distribution strategy. Since consumers with high wine interest show a higher willingness to pay for the family attribute, it may be worth targeting this consumer segment, even if this is linked to overall higher acquisition cost. Nonetheless, it is important to highlight that the price premia for the family attribute have shown significance for any of the both classes. This makes the attribute a valuable element from a consumer point of view, particularly as it has also been shown to be significant across the whole population (research question 1). It may be highlighted that the modelled dichotomy of the latent class model is a mere means of estimating the influence of hypothesised membership variables in a probabilistic model. It may be assumed that more likely a continuous distribution of attribute relevance and associated willingness to pay may exist in the population (cp. section 5.1.2 and related results) which further implies that phenomenological differences in the population are more gradual than it appears from the results of this modelling approach. Nonetheless, the latent class model has provided further insights into answering the questions which variables influence this continuum, and hence this approach is another important methodological element of this work.

7.4 Implications

The findings of this research bear several implications for the wine industry and for policy makers. The following sections discuss the most important aspects that emerge from this study with respect to brand equity, agency theory and the current market environment.

7.4.1 Brand equity

The literature review suggests that the value of wine derives from a complex set of attributes (cp. section 2.2.2)[10]. On the one hand, the quality of a wine's intrinsic characteristics can only be assessed post purchase and consumers in most settings can only evaluate

[10]It is important to highlight that family ownership of a business can add value at an organisational level, which positively affects long-term performance of a firm. As this research is focussed on the image of family firms from a consumer perspective, a discussion of organisational characteristics in family firms is conceded to dedicated studies (Köhr et al. 2016, forthcoming).

a wine based on its extrinsic attributes in a purchase setting. The structural model in section 7.2 shows that the perceived quality of wines from family wineries is higher than the one of their non-family counterparts. Hence, family firm image of a business is able to reduce information asymmetries during the choice of wine. On the other hand, Beckert et al. (2017) find that wine can be considered a cultural product whose value derives from a social process. Theoretic foundations are largely based on Bourdieu (1996) who states that certain goods do not obtain their intrinsic value from the sole material act of production, but from a complex interplay of agents and institutions which are related to the original work. This aspect is important, as it indicates that even in case a consumer can evaluate intrinsic qualities of a wine in absence of information asymmetries, symbolic cues still shape up an important part of product value. This conceptualisation is fully in line with the findings of this research, since the structural model underlines the relevance of a wider set of additional cues other than perceived quality to affect behavioural outcomes of consumers when choosing wine.

It is further important to put the brand equity attributable to family firm image into context to other sources of brand equity. The discussion of other cues of brand equity in section 7.1 shows a comparable effect size of gold medals and recommendations from friends. For the case of gold medals it becomes clear that this cue does not apply at a firm level but is linked to individual products. Even more, a single medal is linked only to a specific vintage of a given wine. In contrast, the family firm cue applies at a firm level to all its products and the brand equity attributable to this cue is linearly related to the overall product sales of a firm. Due to this relationship the absolute brand equity that can be derived from family firm image is of much higher magnitude than the effect of gold medals, despite the comparable effect size. Hence, the brand equity deriving from family firm image is unconditional of exogenous influences and an intrinsic characteristic of the firm. Hence, family firm image can be understood as a durable and distinctive characteristic of a business.

7.4.2 Principal-agent problems

This section applies agency theory to discuss the problems that constitute from the nature of the competitive advantage that family firm image generates. It is assumed that assumptions of neoclassic theory can be violated due to the existence of transaction cost.

This section is not explicitly linked with the data of this survey and constitutes a thought experiment to derive further implications based on the results of the theoretical and empirical parts of this study.

7.4.2.1 Asymmetric information

Perceived family firm image positively affects attitudinal and behavioural loyalty of consumers (principal). For this reason perceived family firm image represents brand equity for businesses (agent). It is important to highlight that an important share of this brand equity emanates from the principal's *perceptions* of this communicated identity through the agent (cp. figure 2.1). When determining whether a business is a family or non-family firm, principals are required to rely on easily accessible information[11]. In many situations it can be considered improbable for principals to extensively gather information prior to the majority of purchase decisions and it is even impossible for principals to obtain clarity about the true nature of an agent as reflected in its true legal ownership and the governance of a business[12]. Hence, principals rely on a preconceived image of an agent[13], which is triggered through signalling. This situation characterises an asymmetric distribution of information between the principal and the agent, which enables the creation of a principal-agent relationship. The fact that such agency relationships can exist in the wine sector has been shown by Beverland and Luxton (2005). Although, the researchers' work reflects that such phenomenon is by no means exclusive to family firms, structural similarities to the referenced work imply that businesses may be inclined to construct a family firm image to pursue a branding strategy which Beverland and Luxton describe as strategic decoupling.

[11] The availability of information depends on the given shopping scenario and is influenced by a multitude of factors. According to Gallucci et al. (2015) the chosen retail channel may be a relevant factor, however only represents one example.

[12] In many settings it is not possible to determine an agent's true identity due to contractual agreements with third parties that govern internal relations within firms. In many countries company law does not require disclosure of such agreements and is a major origin of asymmetric information.

[13] Carrigan and Buckley (2008) present evidence in favour of the existence of such preconceived image in the given case of family firms.

7.4.2.2 Self interest

From an agent's point of view, brand equity that derives from family firm image is linearly linked to the wine sales of a business[14]. Hence, the larger the agent's derived brand equity, the larger the interest to leverage and maintain[15] this equity. According to this relation, agents are willing to invest in this family firm image as long as its costs are smaller than the returns obtained from developing this family identity. This relation describes the agent's self interest. The structural equation model shows that family firm image in a consumer's mind is linked to a distinctive set of attributes. From the results it can be seen that specific aspects are considered to be highly different between family and corporate wineries. Consumers use family firm image of a business to infer a wide range of attributes that positively affect behavioural outcomes. Hence, the principal's self interest is to identify the businesses that provide the highest utility during the purchase process while minimising his own cost of information to reach an informed decision.
From table 6.16 it can be seen that localness ranks third among the attributes with respect to its differential perception between both firm types. Fernández-Olmos et al. (2009) have found that the larger a company is, the less likely it is to manage vineyard plots itself and the higher is the likelihood of sourcing wine or grapes from the market. Due to this external sourcing, businesses put less emphasis on their focal territory which is closely linked to the localness of a winery. From these relationships it can be constituted that vertical integration is an element of a winery's perceived localness. Further, it can be established from earlier research that the production of high-quality wines[16] is also linked

[14]This does not represent a sweeping assumption about the nature of family firms with respect to their size and it is important to clearly state that this thought experiment is of theoretic nature and evolves from the specific character of the price premium, which is linked to a unit basis of a specific product and hence in absolute terms proportionally depends on unit sales. Economic theory suggests an expected behaviour of a firm due to the nature of the price premium when considering the utility maximisation of a rational agent (*homo economicus*). Whether such theory meets observed market behaviour of agents has not been subject of this study and related research in the sector field has not yet investigated related effects. With equal emphasis it is underlined also once more in footnote 21 that this is not an attempt of taking inherent assumptions about the size of family firms, but rather an application of agency theory.

[15]Maintaining such family firm image in an principal-agent condition may equally comprise a firm's pursuit to reduce the perception of its corporate character from a consumer point of view.

[16]Theoretic foundation of problems in the quality management of external grape-procurement itself are based in agency theory and contractual incompleteness. Codron et al. (2013) present a detailed review of the problems linked to situations where wineries are in the role of principals and grape suppliers act as agents. In the customer-winery relationship, wineries, who are acting as agents align their self interest based on their own previous exposure in the grape-procurement process. This is to say that the higher

to the degree of vertical integration of a winery (Fernández-Olmos et al. 2009, Malorgio and Grazia 2010). The authors further establish that vertical integration is not only linked to the production of high-quality wines but also to the uniqueness of a product. Based on the results of the structural model, these variables are highly relevant as they influence consumer loyalty. As it can be seen from the links between actual business characteristics (i.e. size) and different variables of brand knowledge, an inverse link between economic relevance (i.e. total brand equity) and the degree to which these attributes are fulfilled by a business exists.

Agents are incentivised to use the presence of asymmetric information in their favour as they project a family firm image. The presence of asymmetric information creates cost for the principal to identify an agent's true characteristics in the market. A risk occurs when the principal is aware of the existence of asymmetric information and screening cost are high. In such situation the principal's expected rational behaviour is to assume that no distinction between the agents can be done. Such scenario is know as *market for lemons* in the literature (Akerlof 1970). Market failure occurs as the principal can no longer efficiently identify the agent's characteristics and tends to chose an agent which signals the highest utility, but provides a true utility that is lower than the signalled one. In such situations a welfare loss occurs both for agents and for the principal, due to the inefficient allocation of resources. On the principal's side this welfare loss is constituted by the fact that the obtained utility from the transaction is lower than the signalled one in the market. For the group of agents in the market the total welfare is lower than the welfare obtained under full information. This welfare loss constitutes from the fact that the agent performing the transaction obtains a higher rent than the one that would be obtained under normal conditions. Other agents, whose signalled characteristics equal their intrinsic characteristic are at disadvantage in such scenario, as it may be assumed that also intrinsic cost are associated with these characteristics. Due to these associated cost, a negative selection of these agents will occur as they may not be in a competitive position in this scenario (cp. *cost of dishonesty*, Akerlof 1970) The problems caused by this market dynamism are amplified by the fact that major agents[17] are more motivated to alter their signalling. Given this background major agents may obtain a significant

the contractual incompleteness in the grape-procurement process, the more likely the self interest of a firm is misaligned with the self interest of a consumer.

[17]To maintain linguistic parsimony, *major agents* are defined as such which obtain higher economic gains due to economies of scale resulting in a higher absolute economic benefit.

advantage in such situation and obtain the largest gains from negative selection.

7.4.2.3 Increasing market efficiency

Institutions in the market can exercise a counteracting role to avoid adverse selection. The role of these institutions is the reduction of uncertainty about the agent's intrinsic characteristics. This role can be exercised by reducing the information cost for the principal by providing relevant information in the decision process at lower cost that the actual cost of dishonesty. Certifications by a third party can reduce such information asymmetry and reduce the incentives of opportunistic behaviour under certain conditions and hence restore market efficiency (Albersmeier et al. 2009). However, it is important to consider the parallels that exist with past dynamics in the market environment, such as with respect to the production of organic food. The discussion in section 7.2.2.2 shows parallels, particularly with respect to selection effects that have occurred in the organic food sector. These effects may either originate from contractual incompleteness from a principal's perspective, misaligned incentive structures or due to insufficient monitoring mechanisms from a theory point of view. Although it is not the role of this research to assess these aspects in detail, it is important to be aware of their presence and to seriously consider the role of asymmetric information and contractual incompleteness in practice.
A further strategy of reducing the risk of asymmetric information is the evaluation of signals. Signals as means of differentiation are grounded in the assumption that a negative correlation between the cost of these signals and the intrinsic quality of the agent exists, while signal cost are unconditional on the principal's response (Spence 1976). Agents in the market may be selected by the presence or absence of such *exogenously costly signal*. One example of such signal may be the point of purchase, which exists unconditionally on the principal's decision. As it can be seen from figure 6.1, a significantly higher share of sales for sales at family wineries occur at the cellar door, particularly among Italian and Australian consumers. Hence, the point of purchase, particularly in family firms, represents a platform of signalling that enables consumers to reduce the risk of asymmetric information. These considerations are of foremost importance of policy makers when framing strategies of rural development. The afore mentioned elements' role in these strategies can represent a starting point of sustained rural development. The following section will further these thoughts based on recent developments in agricultural markets.

7.4.3 Recent market developments

From a broader perspective, it may be underlined that the cost of information have greatly decreased in today's age of information and communication technology. Higher transparency for consumers exists through increased connectivity. These recent developments can help agents to transparently and unambiguously communicate their identity. Agents concealing their true characteristics run the risk of being exposed by principals, who have a joint interest in strengthening market mechanisms to avoid welfare losses. Gallucci et al. (2015) state that branding the family business at corporate level may become more important in the future as wine sales happen more and more online and consumers consider a broadening range of information[18]. However, these recent developments require resources in a business to innovate and align communication strategies to be able to leverage advantages of this market environment. Similarly, a meta-analysis by Suess-Reyes and Fuetsch (2016) points out that in the recent past the agricultural sector in developed countries has experienced strong exposure to structural change. Important cornerstones that characterise this transformation are a decreasing role of subsidies in the agricultural sector (European Commission 2018), an increasing degree of regulatory measures and increasingly mature and sophisticated markets within the European Union. Businesses are required to actively react to this changing market environment to safeguard their competitiveness and ensure their long-term survival. However, Chrisman et al. (2015) have recently found that despite superior resource abilities, family firms are less willing to engage in innovation putting them at risk of becoming passive victims in the transformation process rather than architects of their future[19]. This characteristic of family firms contrasts the substantial body of academic literature which calls for the need of innovation in the agricultural sector. This call for innovation stems from the background that under perfect competition rents of market participants approach zero. It may be expected that with declining economic support by the European Common Agricultural Policy more agricultural businesses may consider diversification to ensure long-term sur-

[18]It may be underlined that these observations may be valid in particular for premium wines and it is yet to be investigated to which degree consumers afford time in purchasing wines that follow the definition of commodities.

[19]In the context of the wine sector, Köhr et al. (forthcoming) find that structural factors of family firms, such as work experience of family members outside the family business, positively affect a firm's propensity to future growth. This finding suggests that certain structural configurations within family firms may facilitate innovation adoption leading to long-term competitiveness.

vival (Weltin et al. 2017). This diversification creates the propensity of innovation in the sector as it promotes the re-combination of resources to produce a novel set of products and services. However, findings also indicate that particularly family businesses with high fixed capital may seek to diversify income outside the sector[20] or even seize their activity. In this regard, Suess-Reyes and Fuetsch (2016) note that diversification of income outside the sector may reduce internal resource capabilities and increase the probability of farm closure. Innovation in family firms may be based on underlying capabilities that represent their unique resource configuration and capital to create and capture value in the marketplace (De Massis et al. 2016). The nature of innovation may be diverse and also represent innovation in communication that may support an agent's signalling in the marketplace to enable principals to take informed decisions (cp. section 7.4.2). Changes in the marketplace are driven by further superordinate trends, such as urbanisation, which re-shape rural economies and may also influence the value attached to family firms. In this context research has found that the proximity of farms to urban centres enables businesses to obtain higher benefits from diversification and multifunctional activities (Zasada et al. 2011). The authors emphasise that these developments are driven by changing lifestyles and "changing consumer demand for local agricultural goods and services" (Zasada et al. 2011, 69). Still, it is important to underline that only a limited potential for the development of marketing of local produce directly can be attributed to this development due to the overall globalisation of demand and consumer preferences. However, the recent tendencies of industrial and globalised food-chains can shape up opportunities for small farms when addressing specific consumer segments. Johnston and Baumann (2007) point out that affluent consumers more and more seek differentiation through cultural consumption in the food space, particularly through the choice of authentic and exotic food. In particular the authors link deeper cultural values, i.e individuality, creativity, refinement and professional expertise, to the valorisation of food. Businesses that respond to these developments in the marketplace are more likely to have a better long-term perspective and greater propensity of firm survival (Cavicchioli et al. 2018). Past research has commonly attributed characteristics of localness, embeddedness, short food-supply chains and concepts of quality to agricultural produce that emanates from (small) rural farms (Hol-

[20] i.e. family members seeking employment in businesses unrelated to the family firm

loway et al. 2007)[21]. This research confirms these findings and allows to infer that family farming is closely linked to these concepts. Fonte (2008) highlights the role of small-scale family farms play in the preservation of knowledge about traditional production practices in a specific agro-ecological context that lay out the foundation of today's protected designations of origin of the European Union that are inherently linked to this knowledge. Although this knowledge may not perform a specialised function in society, it represents cultural value linked to traditions that have evolved and been passed on over generations. Beckert et al. (2017) have shown that this knowledge is relevant as it represents symbolic capital, which is an important determinant of the value of wine which is derived in the field of cultural production (cp. section 2.2.2). This reasoning is supported by the data of this research, which finds that consumers in any country link a significant added value to these concepts as they are able to increase trust in products and provide added satisfaction as these concepts represent a possible response to "the effects of 'industrial' food supply chains and the possible risks to themselves *(consumers)*" (Holloway et al. 2007, 4)[22]. Social contracts between producers and consumers are a central element of such concepts. Consumers are made aware of their possibility to support the development of rural economies by purchasing a given product and engaging in a wider vision about the effects of food production from an economic, social and environmental angle. Through supporting regional food economies, consumers can also avoid a central problem of global food chains, which is characterised by long and anonymous supply chains, in which "the origin of products is more or less meaningless, the quality aspects are in conflict with efficiency and competitive cost structures" (Siebert et al. 2006, 16). However, Fonte (2008) points out that the valorisation of local territory requires a co-ordinated collective effort, which can be formalised in collective institutions. Despite the legal protection of regional

[21] Kneafsey (2010) criticises that the discourse about local and regional agriculture commonly takes inherent assumptions about the size of local actors. Unreflexive and normative assumptions about localism may unjustly exclude actors that produce at larger scale from the discussion about localness. To avoid this 'local trap' (Born and Purcell 2006), this research did not test farm size within the structural model as it may have prompted a biased view. Without any further discussion of these approaches, it is important to highlight that this research adopts a perspective of localness and regionality that is based on the degree to which a business is perceived to be embedded in and to contribute to the development of local communities. To some degree this criticism can also be extended to early family firm research in the field of agricultural economics, which often confounds size of a business with the family nature of the same. Examples of this synonymous use in past research can be found in Hu et al. (2012) and Darby et al. (2008). Similarly to the proceeding regarding the localness construct, the construct of family firm image adopted in this work is conceptually independent of any assumptions about firm size.

[22] text in italics added for better comprehension of the reference

produce, Fonte argues that the European system of protected designations of origin has failed to protect local actors by incentivising non-local actors to move their operations into these respective areas. Other attempts have been taken to make differences in the production process of a wine visible to consumers by additional protected terms. The prominent French words *mis(e) en bouteille à la propriété / au domaine / au château* and their Italian counterparts *imbottigliato all'origine* or *integralmente prodotto* provide some information about the degree of vertical integration. Nevertheless, this effort can only be considered to have limited impact as it does not include all aspects linked to the economic actors and the idiosyncratic qualities attached to them. In this context, this study presents scientific evidence that consumers link family firm image with a set of attributes that are part of a multifarious picture of idiosyncratic qualities of these businesses. A further particularly strong point apart from localness is the customer orientation of these businesses (cp. table 6.16). This finding is a further case in point that supports the view of the reconnection hypothesis of Fonte (2008). Figure 6.1 provides further evidence for this point, as it shows that clients of family firms seek personal interaction at the cellar door, particularly in Italy and Australia. This personal interaction may be a risk reduction strategy by consumers due to a lack of institutional protection of related asymmetric information (cp. section 7.4.2). A further avenue which is of high importance for family firms in the agricultural space can be drawn from superordinate developments at product level. Klaus and Maklan (2007) argue that despite product-centric approaches have been largely successful in the past, new business models which augment a core product with a service have shown promising success. The authors argue that, particularly in the field of fast moving consumer goods, consumer loyalty and profit margins have been eroding. Brands can establish a powerful link between the products at their core and a sphere of complementing services by shaping an augmented brand. In line with earlier research, such as Craig et al. (2008), this research shows the high valuation of customer-centric qualities of family firms. This may open an opportunity for family firms to create customer-based brand equity by amending the definition of their brand through experiential benefits that are shaped by the family nature of these firms. Experiential benefits can be delivered through added services for instance. However, it may not be neglected that this research also presents significant evidence that consumers attribute particular value to the core products of family firms through the differentially perceived underlying production process compared to their non-family counterparts.

Chapter 8

Conclusions, limitations and directions for future research

This chapter summarises the work of the thesis, points out limitations of the chosen approach and proposes avenues for future research.

8.1 Conclusions

This research follows recent calls in the field to investigate consumer perceptions of family firms (Babin et al. 2017) and provides insight into three overarching research questions (cp. section 3) using a rigorous theoretical framework and state-of-the-art analytic methods. Results contribute to a significant gap of consumer research on family firm branding (Felden et al. 2016, Sageder et al. 2018). The analytical proceeding is divided into three steps. First, discrete choice models investigate the first fundamental research question and unambiguously point out that family firm status is a relevant driver of consumer choice. The investigation of the second research question provides insight into the question how family firms are thought to differ from their non-family counterparts and how these differences translate into consumer loyalty. Third and last, the investigation of research question three explores heterogeneity among consumers and proposes several demographic variables that are linked to the valorisation of family winery origin of a wine. Although the importance of individual associations with family wineries shows variation between the countries under investigation, family firm status provides significant added

value to consumers in all countries. No previous studies have investigated this specific effect using multivariate statistical methods across multiple countries and only few others, such as Mueller, Lockshin, Saltman and Blanford (2010), have pinpointed towards first evidence. With a dedicated experimental design to specifically investigate the role of family firm status in consumer choice, this study provides quantitative evidence supporting earlier theoretic advances by Blombäck (2011). Consumer data unambiguously show that family firm image can be considered a strategic resource. This evidence is an important precondition of Blombäck's conceptualisation of family firm status as brand element. The importance of the family firm attribute of a business has shown variation between countries. As it can be seen from the results, effects on consumer choice are significant in any country but the least pronounced in Australia. The most marked effect in absolute terms is observed in the US sample (tables 6.4 and 6.6)[1]. When applying relative measures, effects are the most marked among Italian respondents (tables 6.3 and 6.5). Further, evidence exists in the Australian sample that the relevance of the family firm attribute decreases at higher price points. While this pattern is found consistently across all models in Australia, no significant effects are found in the US, and only one model has shown significance in the Italian sample. In a ranking of all choice attributes, family firm status ranks as the third most important attribute in Italy (after origin and gold medal) and the United States (after price and recommendation by a friend) across all linear and non-linear model specifications. In the Australian sample, the family attribute ranks last, however, still exhibits significant influence on the utility function.

Findings of the discrete choice model are consistently confirmed though latent variable models. The construct of attitudinal loyalty in the latent variable models conceptually parallels the measurement of willingness to pay in the discrete choice models and adds further explanatory power to the analysis. The investigations of the latent variable models are grounded in fundamental research in marketing, most prominently referring to earlier work of Chaudhuri and Holbrook (2001) and Esch et al. (2006). Based on this previous knowledge the thesis develops an adapted application of this overarching framework to family firms. The suitability of the analytical approach is also seen in the wide confirmation of results across countries (cp. table 6.15) and research questions. It is found that not only attitudinal, but also behavioural loyalty is positively affected by the family

[1]In order to draw this comparison local currencies have been converted to EUR with the exchange rate of 29 October 2018 for the individual preferred model specification.

firm attribute. The fact that a business is a family firm (family firm status) results in an actual differential perception of consumers and is measured as family firm image. This distinct image is found to be an antecedent of different elements of brand knowledge, which have been identified earlier by Sageder et al. (2018). While family firm image has been found to significantly influence each of these elements, differences between countries are observed. However, more marked differences between countries are observed for the relationships between brand knowledge and brand relationship. A notable difference is the differential effect of long-term orientation, which negatively affects brand satisfaction in the Australian and the US sample, while a significant positive effect is found for the Italian sample. This finding is a clear example that key attributes linked to family firms need to be evaluated in their respective cultural context. The observed pattern are reflected in Hofstede et al.'s (2010) culture scores shown in figure 7.1. Similarly, cultural influences can be seen in relationships between brand relationship and behavioural outcomes. In this regard the Italian sample shows a stronger influence of brand trust on the measurements of loyalty, while showing a significantly lower effect of brand satisfaction on behavioural outcomes. When considering latent means of the construct between family wineries and corporate wineries, both firm types show the most marked differences with respect to their customer orientation, the perceived localness of these businesses and the perceived corporate social responsibility. This finding parallels earlier findings by Craig et al. (2008) who find that family businesses can leverage their brand identity through a customer-centric orientation. Unlike the previous study, it is also found that product-related characteristics, such as perceived quality are perceived higher among family businesses, however with smaller effect sizes. Such smaller effect sizes are particularly observed among the Australian and US samples. From the comparison of latent means it is also seen that family firms show a stronger brand relationship (brand trust and brand satisfaction) and in addition exhibit higher d-values (Cohen 1988) regarding behavioural outcomes than corporate wineries. As effect sizes of attitudinal loyalty are consistently found higher than the ones of behavioural loyalty, family wineries are more likely to achieve price premia and positive word of mouth, while results suggest that effects on repeat purchase behaviour are less pronounced. Results of the choice experiments have previously provided a methodologically sophisticated approximation of the price premium of products that originate from family firms. Despite smaller effect sizes when considering the latent means of behavioural outcomes, it may be emphasised that the path coefficients

for attitudinal and behavioural loyalty as dependent variables show high significance in the structural model. The strong perceptional difference of the localness attribute represents a strong opportunity for family wineries in the current market environment in which local produce receive a high level of consumer appreciation (Feldmann and Hamm 2015). This aspect of localness is also linked to further opportunities for family firms in the context of multifunctional and peri-urban agriculture. Heterogeneity of consumer segments within countries has been identified. Differential findings with respect to preferences indicate that despite the significant positive effect of the family winery attribute on consumer choice, the linked price premia show vast differences between consumer groups. Hence, tailored strategies can help accessing key consumer segments that show a stronger preference for wine from family wineries. In two out of three countries consistent pattern could be pointed out that characterise consumer groups exhibiting a higher willingness to pay for the family winery attribute. It is generally found that the higher the wine interest of consumers, the higher their respective appreciation of this type of businesses. Similarly, it is found that the younger consumers[2] are, the higher their preference for the family winery attribute. It appears that brand image elements which are intrinsically linked to family firms, such as their reputation for production of high-quality goods, help these firms to develop a distinct image in the marketplace.

From a methodological perspective, and in line with previous research, this study stresses the attention researchers should devote to the analytical specification of the utility function when modelling monetary attributes (Swait et al. 2016), because the assumption of constant marginal utility for monetary attributes may not always be reasonable (Hoyos 2010), particularly when modelling wine choices (Hardt et al. 2012, Lecat et al. 2016). The data further provide a case in point that the assumption of a linear price-utility relationship can cause severe bias of model estimations when non-linearities in the data are observed. Statistical test procedures can provide guidance in identifying the most appropriate model specification among a set of alternatives.

[2] Age of respondents has been analysed while controlling for other variables such as income and wine interest. This is an important aspect to reduce omitted variable bias of the models and needs consideration when interpreting the results of this study.

8.2 Limitations

As any research, this study is not exempt from limitations. First and most importantly, the replication of the study in both Old World and New World wine countries has shown variability of findings. Although the vast majority of findings hold across countries, few individual attributes in the structural model (i.e. long-term orientation) are subject to opposing perceptions by consumers across countries. Although this differential is likely to have cultural origins that can be explained with Hofstede et al.'s culture scale, further studies are required to validate these hypothesised parallels. Despite the conclusions drawn by this study show to be vastly independent of country effects, they only span a sample of three countries, out of which all represent in developed economies. For this reason, before adopting the implications of this study to other countries, replication is required to validate findings for these countries in the first place. Further, it has to be highlighted that the findings of this research are tailored to a certain product category, which is can be considered a luxury good (Heine et al. 2016) and derives its value from a complex sociological process (Beckert et al. 2017). Hence, findings of this study relate to a hedonic product category and may have little impact on other product categories, particularly on such which carry primarily utilitarian values (Chaudhuri 2002, Chaudhuri and Holbrook 2001, Gallucci and D'Amato 2013). Methodically this study, particularly the discrete choice experiment, aimed to identify principal consumer preferences for family firms. In doing so, the representation of the family attribute was stated as factual information and not in a more common form, such as a brand slogan or as seal or affiliation to a family business association. This proceeding has reduced the realism of the experiment and does not represent a common shopping scenario, i.e. as faced in bottle shops and supermarkets which represent a high share of actual purchase occasions even for family wineries (cp. figure. 6.1). In order to obtain a purified view on effects related to family firm status this study has not implemented a choice experiment using photo-realistic renderings of wine bottles, which represents a further limitation. Although these points represent potential limitations, they naturally derive from the research objective and are a relevant connecting point of further studies.

8.3 Future research

The body of consumer research on family firms has been scarce in the past and little knowledge exists about this key stakeholder group. Only in the past decade, however with an accelerating pace in the past five years, researchers have begun to address the significant lack of knowledge in the field of family firm consumer research (for a review compare Astrachan Binz et al. 2018, Beck 2016, Sageder et al. 2018). Since then, several contributions added to pioneering theoretic contributions to family firm brand research by Blombäck (2009, 2010, 2011). Before, little research in the field existed and notably Orth and Green (2009) may have paved the way for recent applied studies. Nonetheless, much work in refining theoretic foundations of family firm brand research is required to develop an integrated framework building a bridge between fundamental research from related disciplines, such as marketing research. This study has aimed to contribute to bridging this gap, but could only provide a first advance in this direction. In addition, the need for further solidification of theoretic foundations and mechanistic relationships between the variables of family firm status (including the unique brand elements linked to it) and behavioural outcomes is required.

Although this study has aimed to provide robust results through replication in Old World and New World wine countries, further replication studies are required. Recent research suggests that the results of this study may be specific to developed countries and hint that in developing countries, family firms may not enjoy higher trust levels than their non-family counterparts (Lude and Prügl 2018). Adding to this, findings have been obtained for a single product category, which derives its value through a complex process (cp. section 2.2.2), in a traditional industry in which family can be considered a symbolic quality (Maguire et al. 2013). For this reason, it is important to apply the framework of this study to other product categories with strong hedonic value. Nevertheless, also an application to product categories with mainly utilitarian value can generate relevant insights to what extent consumer preference and structural relationships of the framework hold for such products.

More research is also required to identify effective means of communication of these elements to consumers. Dedicated work may include the investigation of interaction effects of different family firm branding strategies, such as the joint communication of the family firm status of a business and additional items that may alter the weight of the family

attribute. The fact that consumer choice in a retail environment is usually performed within few seconds (Dickson and Sawyer 1990) highlights that research on the effective communication of the family nature of a businesses is highly relevant. Future research in the field may also consider the communication of family firm identity across different channels, and investigate the differential effects between its communication at corporate and product level (Gallucci et al. 2015). This aspect is highly important as this study could show that a high share of wine even from family wineries is bought in supermarkets and bottle shops (cp. figure. 6.1). In addition, replication studies through in-store shopping experiments or the evaluation of post purchase data may represent an opportunity to underline the robustness of the findings though the use of different research methodologies.

Research gaps related to the guiding questions of this study are not exclusive to field of marketing, but are more widely felt within field of agricultural economics. Although past research has underlined the central role of family firms in rural areas (cp. section 1.1), the future role of these businesses remains largely unknown. Research into these related aspects is well-justified since family firms deliver a significant added value to consumers, as shown in this study, and represent an important anchoring element in rural communities.

Appendix A

Tables

A.1 Sample characteristics

Table A.1: Sample demographic characteristics: Australia

variable	level	%
gender	Female	53
	Male	47
age	Less than LDA	0
	LDA - 24	8
	25 - 34	20
	35 - 44	20
	45 - 54	17
	55 - 64	17
	65 and older	19
region	Australian Capital Territory	3
	New South Wales	31
	Northern Territory	0
	South Australia	11
	Queensland	19
	Tasmania	2
	Victoria	26
	Western Australia	8

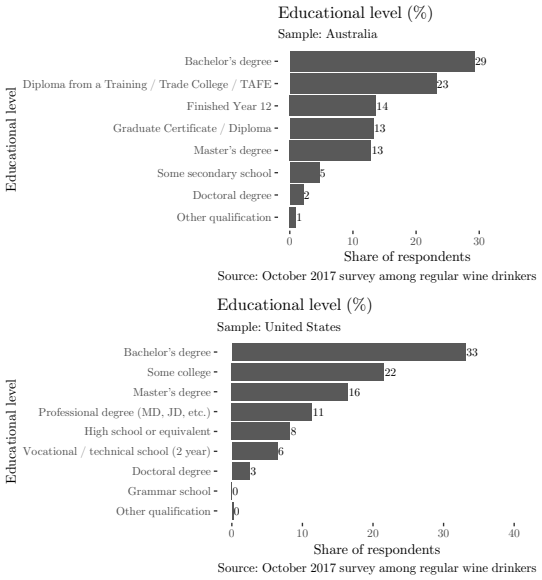
Table A.2: Sample demographic characteristics: Italy

variable	level	%
gender	Female	51
	Male	49
age	Less than LDA	0
	LDA - 24	8
	25 - 34	14
	35 - 44	19
	45 - 54	20
	55 - 64	16
	65 and older	24
region	North	49
	Centre	18
	South	22
	Islands	12

Table A.3: Sample demographic characteristics: United States

variable	level	%
gender	Female	55
	Male	45
age	Less than LDA	0
	LDA - 24	7
	25 - 34	22
	35 - 44	15
	45 - 54	17
	55 - 64	19
	65 and older	22
region	New England	5
	Mid-Atlantic	17
	East North Central	15
	West North Central	6
	South Atlantic	20
	South Central	12
	Mountain	8
	Pacific	17

Figure A.1: Sample demographic characteristics: education level



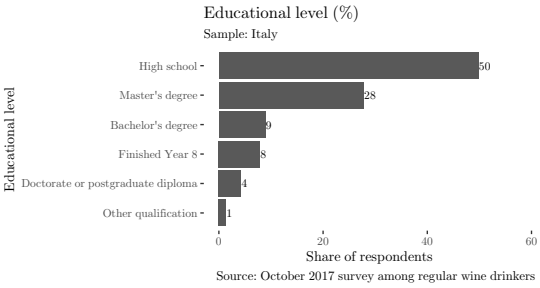
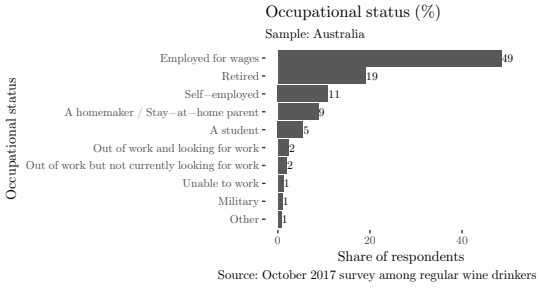
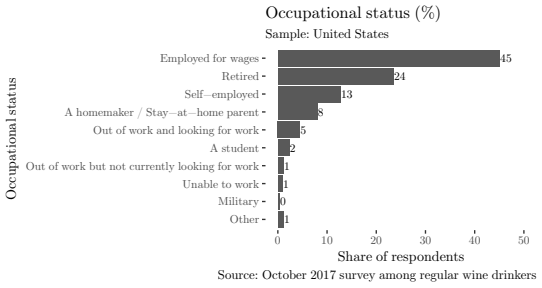


Figure A.2: Sample demographic characteristics: occupational status





A.2 Choice situations

The following choice situations have been generated as stated in section 4.3. The mapping of each level id and its label can be found in table 4.1.

Table A.4: Choice-based conjoint experiment: choice situations

		Alternative 1					Alternative 2				
Choice Situation	Block	Fam.	Med.	Sug.	Ori.	Pri.	Fam.	Med.	Sug.	Ori.	Pri.
1	2	1	0	1	3	4	0	1	0	1	3
2	1	0	0	1	4	2	1	1	0	3	3
3	2	0	0	1	1	2	1	1	0	3	1
4	1	1	1	1	2	3	0	0	0	4	2
5	1	1	1	0	1	4	0	0	1	4	3
6	2	0	1	0	2	2	1	0	1	3	4
7	2	1	0	0	1	3	0	1	1	2	3
8	2	1	0	0	2	1	1	1	1	4	4
9	1	1	0	0	4	2	0	1	1	1	2
10	1	0	1	0	3	3	1	0	1	2	4
11	1	1	1	1	3	3	0	0	0	4	3
12	2	0	1	0	4	1	1	0	1	2	2
13	1	0	0	1	1	4	1	1	0	4	4
14	2	0	1	1	3	4	0	0	0	2	1
15	2	0	1	1	4	4	0	0	0	3	1
16	2	1	1	1	4	3	0	0	0	3	2
17	1	0	1	0	2	1	1	0	1	1	1
18	1	0	0	1	3	2	1	1	0	1	2
19	1	1	0	0	2	1	0	1	1	1	1
20	2	1	0	0	1	1	1	1	1	2	4

A.3 MNL model estimation

A.3.1 Linear models with interactions

A.3.1.1 Australia

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	-0.0434	0.0340	-1.28	0.20
2	B_FAMILY	0.309	0.0440	7.01	0.00
3	B_FAMILY_X_PRICE	-0.387	0.118	-3.28	0.00
4	B_MEDAL	0.476	0.0412	11.56	0.00
5	B_ORIGIN_2	-0.134	0.0558	-2.40	0.02
6	B_ORIGIN_3	0.695	0.0598	11.63	0.00
7	B_ORIGIN_4	-0.622	0.0625	-9.96	0.00
8	B_PRICE	-1.36	0.151	-9.02	0.00
9	B_SUGGESTION	0.583	0.0472	12.35	0.00

Summary statistics

Number of observations = 4320

Number of excluded observations = 810

Number of estimated parameters = 9

$$\begin{aligned} \mathcal{L}(\beta_0) &= -2994.396 \\ \mathcal{L}(\hat{\beta}) &= -2571.191 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 846.409 \\ \rho^2 &= 0.141 \\ \bar{\rho}^2 &= 0.138 \end{aligned}$$

A.3.1.2 Italy

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.115	0.0403	2.84	0.00
2	B_FAMILY	0.500	0.0490	10.20	0.00
3	B_FAMILY_X_PRICE	-0.234	0.125	-1.88	0.06
4	B_MEDAL	0.652	0.0459	14.22	0.00
5	B_ORIGIN_2	1.27	0.0665	19.07	0.00
6	B_ORIGIN_3	-0.966	0.0653	-14.78	0.00
7	B_ORIGIN_4	-1.10	0.0699	-15.75	0.00
8	B_PRICE	0.211	0.154	1.37	0.17
9	B_SUGGESTION	0.364	0.0501	7.25	0.00

Summary statistics

Number of observations = 4627

Number of excluded observations = 553

Number of estimated parameters = 9

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3207.192 \\ \mathcal{L}(\hat{\beta}) &= -2130.759 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 2152.866 \\ \rho^2 &= 0.336 \\ \bar{\rho}^2 &= 0.333 \end{aligned}$$

A.3.1.3 United States

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.0661	0.0309	2.14	0.03
2	B_FAMILY	0.433	0.0407	10.63	0.00
3	B_FAMILY_X_PRICE	-0.168	0.105	-1.60	0.11
4	B_MEDAL	0.381	0.0363	10.52	0.00
5	B_ORIGIN_2	-0.0405	0.0511	-0.79	0.43
6	B_ORIGIN_3	-0.236	0.0546	-4.32	0.00
7	B_ORIGIN_4	0.247	0.0550	4.49	0.00
8	B_PRICE	-0.692	0.127	-5.43	0.00
9	B_SUGGESTION	0.549	0.0420	13.08	0.00

Summary statistics

Number of observations = 4651

Number of excluded observations = 449

Number of estimated parameters = 9

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3223.828 \\ \mathcal{L}(\hat{\beta}) &= -3043.575 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 360.505 \\ \rho^2 &= 0.056 \\ \bar{\rho}^2 &= 0.053 \end{aligned}$$

A.3.2 Quadratic models with interactions

A.3.2.1 Australia

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	-0.0335	0.0341	-0.98	0.33
2	B_FAMILY	0.367	0.0490	7.50	0.00
3	B_FAMILY_X_PRICE	-0.248	0.129	-1.93	0.05
4	B_MEDAL	0.476	0.0409	11.62	0.00
5	B_ORIGIN_2	-0.149	0.0556	-2.67	0.01
6	B_ORIGIN_3	0.734	0.0609	12.05	0.00
7	B_ORIGIN_4	-0.607	0.0618	-9.82	0.00
8	B_PRICE	-1.46	0.157	-9.24	0.00
9	B_PRICE_SQUARED	-1.69	0.625	-2.70	0.01
10	B_SUGGESTION	0.589	0.0477	12.36	0.00

Summary statistics

Number of observations = 4320

Number of excluded observations = 810

Number of estimated parameters = 10

$$\begin{aligned} \mathcal{L}(\beta_0) &= -2994.396 \\ \mathcal{L}(\hat{\beta}) &= -2567.587 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 853.618 \\ \rho^2 &= 0.143 \\ \bar{\rho}^2 &= 0.139 \end{aligned}$$

A.3.2.2 Italy

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.118	0.0406	2.89	0.00
2	B_FAMILY	0.549	0.0554	9.91	0.00
3	B_FAMILY_X_PRICE	-0.178	0.127	-1.41	0.16
4	B_MEDAL	0.655	0.0469	13.97	0.00
5	B_ORIGIN_2	1.28	0.0669	19.10	0.00
6	B_ORIGIN_3	-0.920	0.0684	-13.44	0.00
7	B_ORIGIN_4	-1.09	0.0692	-15.70	0.00
8	B_PRICE	0.157	0.160	0.99	0.32
9	B_PRICE_SQUARED	-1.47	0.774	-1.90	0.06
10	B_SUGGESTION	0.377	0.0512	7.35	0.00

Summary statistics

Number of observations = 4627

Number of excluded observations = 553

Number of estimated parameters = 10

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3207.192 \\ \mathcal{L}(\hat{\beta}) &= -2128.943 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 2156.498 \\ \rho^2 &= 0.336 \\ \bar{\rho}^2 &= 0.333 \end{aligned}$$

A.3.2.3 United States

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.0693	0.0310	2.24	0.03
2	B_FAMILY	0.462	0.0444	10.39	0.00
3	B_FAMILY_X_PRICE	-0.101	0.112	-0.90	0.37
4	B_MEDAL	0.381	0.0364	10.48	0.00
5	B_ORIGIN_2	-0.0476	0.0512	-0.93	0.35
6	B_ORIGIN_3	-0.217	0.0554	-3.92	0.00
7	B_ORIGIN_4	0.258	0.0556	4.64	0.00
8	B_PRICE	-0.730	0.130	-5.63	0.00
9	B_PRICE_SQUARED	-0.909	0.549	-1.66	0.10
10	B_SUGGESTION	0.548	0.0421	13.02	0.00

Summary statistics

Number of observations = 4651

Number of excluded observations = 449

Number of estimated parameters = 10

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3223.828 \\ \mathcal{L}(\hat{\beta}) &= -3042.215 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 363.225 \\ \rho^2 &= 0.056 \\ \bar{\rho}^2 &= 0.053 \end{aligned}$$

A.3.3 Cubic models with interactions

A.3.3.1 Australia

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	-0.0323	0.0342	-0.95	0.34
2	B_FAMILY	0.407	0.0521	7.81	0.00
3	B_FAMILY_X_PRICE	-0.300	0.131	-2.29	0.02
4	B_MEDAL	0.527	0.0459	11.49	0.00
5	B_ORIGIN_2	-0.155	0.0557	-2.78	0.01
6	B_ORIGIN_3	0.769	0.0630	12.21	0.00
7	B_ORIGIN_4	-0.587	0.0622	-9.44	0.00
8	B_PRICE	-2.17	0.321	-6.76	0.00
9	B_PRICE_CUBIC	4.47	1.78	2.51	0.01
10	B_PRICE_SQUARED	-1.90	0.637	-2.99	0.00
11	B_SUGGESTION	0.601	0.0483	12.45	0.00

Summary statistics

Number of observations = 4320

Number of excluded observations = 810

Number of estimated parameters = 11

$$\begin{aligned} \mathcal{L}(\beta_0) &= -2994.396 \\ \mathcal{L}(\hat{\beta}) &= -2564.424 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 859.943 \\ \rho^2 &= 0.144 \\ \bar{\rho}^2 &= 0.140 \end{aligned}$$

A.3.3.2 Italy

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.123	0.0413	2.96	0.00
2	B_FAMILY	0.543	0.0565	9.60	0.00
3	B_FAMILY_X_PRICE	-0.157	0.132	-1.19	0.23
4	B_MEDAL	0.645	0.0505	12.76	0.00
5	B_ORIGIN_2	1.28	0.0666	19.21	0.00
6	B_ORIGIN_3	-0.927	0.0694	-13.35	0.00
7	B_ORIGIN_4	-1.09	0.0693	-15.70	0.00
8	B_PRICE	0.361	0.403	0.90	0.37
9	B_PRICE_CUBIC	-1.35	2.44	-0.56	0.58
10	B_PRICE_SQUARED	-1.39	0.781	-1.78	0.07
11	B_SUGGESTION	0.380	0.0519	7.33	0.00

Summary statistics

Number of observations = 4627

Number of excluded observations = 553

Number of estimated parameters = 11

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3207.192 \\ \mathcal{L}(\hat{\beta}) &= -2128.779 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 2156.825 \\ \rho^2 &= 0.336 \\ \bar{\rho}^2 &= 0.333 \end{aligned}$$

A.3.3.3 United States

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.0651	0.0310	2.10	0.04
2	B_FAMILY	0.479	0.0448	10.67	0.00
3	B_FAMILY_X_PRICE	-0.153	0.115	-1.32	0.19
4	B_MEDAL	0.413	0.0393	10.52	0.00
5	B_ORIGIN_2	-0.0493	0.0513	-0.96	0.34
6	B_ORIGIN_3	-0.191	0.0569	-3.36	0.00
7	B_ORIGIN_4	0.267	0.0556	4.81	0.00
8	B_PRICE	-1.25	0.283	-4.44	0.00
9	B_PRICE_CUBIC	3.47	1.66	2.09	0.04
10	B_PRICE_SQUARED	-1.00	0.554	-1.81	0.07
11	B_SUGGESTION	0.546	0.0421	12.99	0.00

Summary statistics

Number of observations = 4651

Number of excluded observations = 449

Number of estimated parameters = 11

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3223.828 \\ \mathcal{L}(\hat{\beta}) &= -3040.026 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 367.602 \\ \rho^2 &= 0.057 \\ \bar{\rho}^2 &= 0.054 \end{aligned}$$

A.3.4 Goodness of fit

Table A.5: Goodness of fit: comparison multinomial logit models

	Model	Linear		Quadratic		Cubic	
		AIC	BIC	AIC	BIC	AIC	BIC
Country	Australia	5160	**5218**	5155	5219	**5151**	5221
	Italy	4280	**4337**	**4278**	4342	4280	4350
	United States	6105	**6163**	6104	6169	**6102**	6173

A.4 MXL model estimation

A.4.1 Linear models without interaction in wtp space

A.4.1.1 Australia

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	-0.0384	0.0514	-0.75	0.46
2	B_MEDAL	0.692	0.0747	9.27	0.00
3	B_MEDAL_S	0.661	0.106	6.21	0.00
4	B_ORIGIN_2	-0.273	0.0836	-3.26	0.00
5	B_ORIGIN_2_S	0.458	0.206	2.23	0.03
6	B_ORIGIN_3	1.25	0.119	10.49	0.00
7	B_ORIGIN_3_S	-1.29	0.143	-9.04	0.00
8	B_ORIGIN_4	-1.22	0.132	-9.26	0.00
9	B_ORIGIN_4_S	1.20	0.145	8.23	0.00
10	B_PRICE	-2.94	0.321	-9.16	0.00
11	B_PRICE_S	3.16	0.408	7.75	0.00
12	B_SUGGESTION	0.891	0.0862	10.34	0.00
13	B_SUGGESTION_S	0.740	0.0963	7.68	0.00
14	B_WTP_FAM	-0.167	0.0257	-6.51	0.00
15	B_WTP_FAM_S	0.245	0.0367	6.67	0.00

Summary statistics

Number of observations = 4320

Number of excluded observations = 810

Number of estimated parameters = 15

$$\begin{aligned} \mathcal{L}(\beta_0) &= -2994.396 \\ \mathcal{L}(\hat{\beta}) &= -2360.442 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 1267.908 \\ \rho^2 &= 0.212 \\ \bar{\rho}^2 &= 0.207 \end{aligned}$$

A.4.1.2 Italy

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.169	0.0510	3.30	0.00
2	B_MEDAL	0.840	0.0750	11.20	0.00
3	B_MEDAL_S	0.527	0.112	4.69	0.00
4	B_ORIGIN_2	2.26	0.179	12.58	0.00
5	B_ORIGIN_2_S	-1.61	0.170	-9.52	0.00
6	B_ORIGIN_3	-1.37	0.129	-10.62	0.00
7	B_ORIGIN_3_S	-0.754	0.156	-4.84	0.00
8	B_ORIGIN_4	-1.60	0.146	-11.01	0.00
9	B_ORIGIN_4_S	-0.836	0.187	-4.48	0.00
10	B_PRICE	1.00	0.257	3.90	0.00
11	B_PRICE_S	1.52	0.667	2.27	0.02
12	B_SUGGESTION	0.368	0.0875	4.21	0.00
13	B_SUGGESTION_S	-0.637	0.180	-3.54	0.00
14	B_WTP_FAM	0.494	0.250	1.97	0.05
15	B_WTP_FAM_S	0.363	0.130	2.80	0.01

Summary statistics

Number of observations = 4627

Number of excluded observations = 553

Number of estimated parameters = 15

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3207.192 \\ \mathcal{L}(\hat{\beta}) &= -2013.433 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 2387.518 \\ \rho^2 &= 0.372 \\ \bar{\rho}^2 &= 0.368 \end{aligned}$$

A.4.1.3 United States

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.145	0.0479	3.03	0.00
2	B_MEDAL	0.629	0.0622	10.11	0.00
3	B_MEDAL_S	0.546	0.0955	5.72	0.00
4	B_ORIGIN_2	-0.0927	0.0718	-1.29	0.20
5	B_ORIGIN_2_S	0.566	0.127	4.47	0.00
6	B_ORIGIN_3	-0.382	0.0960	-3.98	0.00
7	B_ORIGIN_3_S	-0.694	0.138	-5.04	0.00
8	B_ORIGIN_4	0.376	0.0984	3.83	0.00
9	B_ORIGIN_4_S	1.20	0.119	10.14	0.00
10	B_PRICE	-1.46	0.314	-4.66	0.00
11	B_PRICE_S	-1.25	0.611	-2.05	0.04
12	B_SUGGESTION	0.925	0.0853	10.84	0.00
13	B_SUGGESTION_S	-1.05	0.113	-9.25	0.00
14	B_WTP_FAM	-0.497	0.139	-3.56	0.00
15	B_WTP_FAM_S	0.488	0.174	2.81	0.00

Summary statistics

Number of observations = 4651

Number of excluded observations = 449

Number of estimated parameters = 15

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3223.828 \\ \mathcal{L}(\hat{\beta}) &= -2839.492 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 768.671 \\ \rho^2 &= 0.119 \\ \bar{\rho}^2 &= 0.115 \end{aligned}$$

A.4.2 Linear models without interaction in preference space

A.4.2.1 Australia

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	-0.0680	0.0510	-1.33	0.18
2	B_FAMILY	0.519	0.0800	6.49	0.00
3	B_FAMILY_S	-1.04	0.110	-9.45	0.00
4	B_MEDAL	0.709	0.0748	9.48	0.00
5	B_MEDAL_S	-0.750	0.101	-7.40	0.00
6	B_ORIGIN_2	-0.247	0.0790	-3.12	0.00
7	B_ORIGIN_2_S	0.493	0.154	3.20	0.00
8	B_ORIGIN_3	1.22	0.123	9.98	0.00
9	B_ORIGIN_3_S	-1.32	0.156	-8.45	0.00
10	B_ORIGIN_4	-1.19	0.135	-8.75	0.00
11	B_ORIGIN_4_S	-1.44	0.165	-8.76	0.00
12	B_PRICE	-2.31	0.247	-9.38	0.00
13	B_SUGGESTION	0.876	0.0906	9.67	0.00
14	B_SUGGESTION_S	-1.11	0.0992	-11.17	0.00

Summary statistics

Number of observations = 4320

Number of excluded observations = 810

Number of estimated parameters = 14

$$\begin{aligned} \mathcal{L}(\beta_0) &= -2994.396 \\ \mathcal{L}(\hat{\beta}) &= -2398.186 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 1192.420 \\ \rho^2 &= 0.199 \\ \bar{\rho}^2 &= 0.194 \end{aligned}$$

A.4.2.2 Italy

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.176	0.0520	3.39	0.00
2	B_FAMILY	0.789	0.0909	8.68	0.00
3	B_FAMILY_S	0.942	0.111	8.46	0.00
4	B_MEDAL	1.00	0.0808	12.38	0.00
5	B_MEDAL_S	0.584	0.105	5.57	0.00
6	B_ORIGIN_2	2.17	0.166	13.06	0.00
7	B_ORIGIN_2_S	-1.65	0.149	-11.09	0.00
8	B_ORIGIN_3	-1.47	0.126	-11.67	0.00
9	B_ORIGIN_3_S	0.870	0.147	5.91	0.00
10	B_ORIGIN_4	-1.67	0.137	-12.18	0.00
11	B_ORIGIN_4_S	0.985	0.167	5.89	0.00
12	B_PRICE	-0.205	0.238	-0.86	0.39
13	B_SUGGESTION	0.644	0.0878	7.34	0.00
14	B_SUGGESTION_S	0.881	0.106	8.31	0.00

Summary statistics

Number of observations = 4627

Number of excluded observations = 553

Number of estimated parameters = 14

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3207.192 \\ \mathcal{L}(\hat{\beta}) &= -2024.274 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 2365.836 \\ \rho^2 &= 0.369 \\ \bar{\rho}^2 &= 0.364 \end{aligned}$$

A.4.2.3 United States

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.152	0.0448	3.39	0.00
2	B_FAMILY	0.697	0.0746	9.34	0.00
3	B_FAMILY_S	0.912	0.0944	9.65	0.00
4	B_MEDAL	0.608	0.0615	9.88	0.00
5	B_MEDAL_S	0.528	0.0909	5.80	0.00
6	B_ORIGIN_2	-0.0910	0.0695	-1.31	0.19
7	B_ORIGIN_2_S	0.447	0.162	2.77	0.01
8	B_ORIGIN_3	-0.399	0.0836	-4.77	0.00
9	B_ORIGIN_3_S	-0.657	0.131	-5.02	0.00
10	B_ORIGIN_4	0.375	0.0987	3.79	0.00
11	B_ORIGIN_4_S	1.26	0.115	10.97	0.00
12	B_PRICE	-1.24	0.206	-6.04	0.00
13	B_SUGGESTION	0.879	0.0838	10.49	0.00
14	B_SUGGESTION_S	-1.12	0.0854	-13.14	0.00

Summary statistics

Number of observations = 4651

Number of excluded observations = 449

Number of estimated parameters = 14

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3223.828 \\ \mathcal{L}(\hat{\beta}) &= -2845.396 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 756.862 \\ \rho^2 &= 0.117 \\ \bar{\rho}^2 &= 0.113 \end{aligned}$$

A.4.3 Quadratic models without interaction in preference space

A.4.3.1 Australia

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	-0.0662	0.0513	-1.29	0.20
2	B_FAMILY	0.630	0.0843	7.47	0.00
3	B_FAMILY_S	-1.06	0.109	-9.71	0.00
4	B_MEDAL	0.727	0.0762	9.55	0.00
5	B_MEDAL_S	-0.745	0.101	-7.41	0.00
6	B_ORIGIN_2	-0.230	0.0798	-2.88	0.00
7	B_ORIGIN_2_S	-0.450	0.177	-2.55	0.01
8	B_ORIGIN_3	1.31	0.121	10.90	0.00
9	B_ORIGIN_3_S	-1.30	0.148	-8.76	0.00
10	B_ORIGIN_4	-1.15	0.137	-8.40	0.00
11	B_ORIGIN_4_S	1.46	0.155	9.43	0.00
12	B_PRICE	-2.39	0.252	-9.48	0.00
13	B_PRICE_SQUARED	-3.61	0.872	-4.14	0.00
14	B_SUGGESTION	0.893	0.0904	9.88	0.00
15	B_SUGGESTION_S	-1.09	0.0961	-11.38	0.00

Summary statistics

Number of observations = 4320

Number of excluded observations = 810

Number of estimated parameters = 15

$$\begin{aligned} \mathcal{L}(\beta_0) &= -2994.396 \\ \mathcal{L}(\hat{\beta}) &= -2386.578 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 1215.635 \\ \rho^2 &= 0.203 \\ \bar{\rho}^2 &= 0.198 \end{aligned}$$

A.4.3.2 Italy

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.180	0.0522	3.45	0.00
2	B_FAMILY	0.907	0.101	8.95	0.00
3	B_FAMILY_S	0.965	0.112	8.60	0.00
4	B_MEDAL	1.03	0.0839	12.22	0.00
5	B_MEDAL_S	0.589	0.106	5.56	0.00
6	B_ORIGIN_2	2.23	0.168	13.28	0.00
7	B_ORIGIN_2_S	-1.70	0.154	-11.01	0.00
8	B_ORIGIN_3	-1.37	0.126	-10.88	0.00
9	B_ORIGIN_3_S	0.881	0.144	6.10	0.00
10	B_ORIGIN_4	-1.64	0.134	-12.25	0.00
11	B_ORIGIN_4_S	0.986	0.169	5.83	0.00
12	B_PRICE	-0.277	0.244	-1.13	0.26
13	B_PRICE_SQUARED	-3.41	1.10	-3.10	0.00
14	B_SUGGESTION	0.682	0.0904	7.55	0.00
15	B_SUGGESTION_S	0.890	0.108	8.25	0.00

Summary statistics

Number of observations = 4627

Number of excluded observations = 553

Number of estimated parameters = 15

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3207.192 \\ \mathcal{L}(\hat{\beta}) &= -2018.607 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 2377.170 \\ \rho^2 &= 0.371 \\ \bar{\rho}^2 &= 0.366 \end{aligned}$$

A.4.3.3 United States

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.149	0.0450	3.31	0.00
2	B_FAMILY	0.754	0.0772	9.77	0.00
3	B_FAMILY_S	0.914	0.0943	9.70	0.00
4	B_MEDAL	0.606	0.0618	9.80	0.00
5	B_MEDAL_S	0.527	0.0910	5.79	0.00
6	B_ORIGIN_2	-0.0844	0.0698	-1.21	0.23
7	B_ORIGIN_2_S	0.448	0.162	2.77	0.01
8	B_ORIGIN_3	-0.350	0.0860	-4.07	0.00
9	B_ORIGIN_3_S	-0.642	0.131	-4.89	0.00
10	B_ORIGIN_4	0.416	0.102	4.07	0.00
11	B_ORIGIN_4_S	1.27	0.116	10.94	0.00
12	B_PRICE	-1.24	0.206	-5.99	0.00
13	B_PRICE_SQUARED	-1.94	0.732	-2.65	0.01
14	B_SUGGESTION	0.872	0.0837	10.41	0.00
15	B_SUGGESTION_S	-1.13	0.0859	-13.12	0.00

Summary statistics

Number of observations = 4651

Number of excluded observations = 449

Number of estimated parameters = 15

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3223.828 \\ \mathcal{L}(\hat{\beta}) &= -2841.632 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 764.392 \\ \rho^2 &= 0.119 \\ \bar{\rho}^2 &= 0.114 \end{aligned}$$

A.4.4 Cubic models without interaction in preference space

A.4.4.1 Australia

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	-0.0790	0.0517	-1.53	0.13
2	B_FAMILY	0.715	0.0929	7.70	0.00
3	B_FAMILY_S	-1.06	0.110	-9.65	0.00
4	B_MEDAL	0.802	0.0805	9.96	0.00
5	B_MEDAL_S	-0.752	0.102	-7.36	0.00
6	B_ORIGIN_2	-0.226	0.0801	-2.82	0.00
7	B_ORIGIN_2_S	0.447	0.198	2.26	0.02
8	B_ORIGIN_3	1.43	0.134	10.63	0.00
9	B_ORIGIN_3_S	-1.36	0.158	-8.55	0.00
10	B_ORIGIN_4	-1.08	0.136	-8.00	0.00
11	B_ORIGIN_4_S	1.50	0.164	9.11	0.00
12	B_PRICE	-3.78	0.536	-7.05	0.00
13	B_PRICE_CUBIC	8.48	2.74	3.10	0.00
14	B_PRICE_SQUARED	-4.27	0.913	-4.68	0.00
15	B_SUGGESTION	0.898	0.0920	9.76	0.00
16	B_SUGGESTION_S	-1.12	0.101	-11.03	0.00

Summary statistics

Number of observations = 4320

Number of excluded observations = 810

Number of estimated parameters = 16

$$\begin{aligned} \mathcal{L}(\beta_0) &= -2994.396 \\ \mathcal{L}(\hat{\beta}) &= -2381.604 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 1225.583 \\ \rho^2 &= 0.205 \\ \bar{\rho}^2 &= 0.199 \end{aligned}$$

A.4.4.2 Italy

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.201	0.0533	3.77	0.00
2	B_FAMILY	0.888	0.102	8.70	0.00
3	B_FAMILY_S	0.971	0.113	8.61	0.00
4	B_MEDAL	1.01	0.0857	11.73	0.00
5	B_MEDAL_S	0.593	0.106	5.58	0.00
6	B_ORIGIN_2	2.24	0.168	13.34	0.00
7	B_ORIGIN_2_S	-1.69	0.154	-10.96	0.00
8	B_ORIGIN_3	-1.41	0.131	-10.82	0.00
9	B_ORIGIN_3_S	0.897	0.145	6.20	0.00
10	B_ORIGIN_4	-1.66	0.136	-12.20	0.00
11	B_ORIGIN_4_S	1.01	0.169	5.96	0.00
12	B_PRICE	0.398	0.527	0.76	0.45
13	B_PRICE_CUBIC	-4.31	3.01	-1.43	0.15
14	B_PRICE_SQUARED	-3.05	1.09	-2.79	0.01
15	B_SUGGESTION	0.703	0.0927	7.58	0.00
16	B_SUGGESTION_S	0.895	0.108	8.30	0.00

Summary statistics

Number of observations = 4627

Number of excluded observations = 553

Number of estimated parameters = 16

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3207.192 \\ \mathcal{L}(\hat{\beta}) &= -2017.656 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 2379.073 \\ \rho^2 &= 0.371 \\ \bar{\rho}^2 &= 0.366 \end{aligned}$$

A.4.4.3 United States

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1	0.141	0.0456	3.10	0.00
2	B_FAMILY	0.776	0.0797	9.74	0.00
3	B_FAMILY_S	0.911	0.0940	9.69	0.00
4	B_MEDAL	0.628	0.0635	9.88	0.00
5	B_MEDAL_S	0.529	0.0910	5.81	0.00
6	B_ORIGIN_2	-0.0792	0.0699	-1.13	0.26
7	B_ORIGIN_2_S	0.452	0.160	2.83	0.00
8	B_ORIGIN_3	-0.315	0.0866	-3.63	0.00
9	B_ORIGIN_3_S	-0.649	0.131	-4.95	0.00
10	B_ORIGIN_4	0.437	0.104	4.22	0.00
11	B_ORIGIN_4_S	1.26	0.115	10.91	0.00
12	B_PRICE	-1.77	0.409	-4.32	0.00
13	B_PRICE_CUBIC	3.50	2.17	1.62	0.11
14	B_PRICE_SQUARED	-2.22	0.764	-2.90	0.00
15	B_SUGGESTION	0.858	0.0826	10.38	0.00
16	B_SUGGESTION_S	-1.13	0.0862	-13.10	0.00

Summary statistics

Number of observations = 4651

Number of excluded observations = 449

Number of estimated parameters = 16

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3223.828 \\ \mathcal{L}(\hat{\beta}) &= -2840.400 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 766.854 \\ \rho^2 &= 0.119 \\ \bar{\rho}^2 &= 0.114 \end{aligned}$$

A.4.5 Goodness of fit

Table A.6: Goodness of fit: comparison of logistic mixture models

	Model	Linear		Quadratic		Cubic	
		AIC	BIC	AIC	BIC	AIC	BIC
Country	Australia	4824	4913	4803	4899	**4795**	**4897**
	Italy	4077	4167	**4067**	**4164**	**4067**	4170
	United States	5719	**5809**	**5713**	5810	**5713**	5816

A.5 LC model estimation

A.5.1 Australia

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1_1	0.0434	0.109	0.40	0.69
2	ASC_ALT1_2	-0.0805	0.0519	-1.55	0.12
3	ASC_CLASS	-2.12	1.52	-1.40	0.16
4	B_DEM_AGE	0.0365	0.0165	2.21	0.03
5	B_DEM_DRINKINGFREQUENCY	-0.0794	0.141	-0.56	0.57
6	B_DEM_INCOME	0.00926	0.0629	0.15	0.88
7	B_DEM_INTEREST	-0.537	0.185	-2.90	0.00
8	B_DEM_MALE	-0.164	0.303	-0.54	0.59
9	B_DEM_UNIVERSITY	0.643	0.403	1.60	0.11
10	B_FAMILY_1	0.430	0.274	1.57	0.12
11	B_FAMILY_2	0.529	0.121	4.36	0.00
12	B_FAMILY_X_PRICE_1	0.981	0.892	1.10	0.27
13	B_FAMILY_X_PRICE_2	-0.592	0.180	-3.28	0.00
14	B_MEDAL_1	0.821	0.393	2.09	0.04
15	B_MEDAL_2	0.507	0.0960	5.28	0.00
16	B_ORIGIN_2_1	-0.974	0.371	-2.63	0.01
17	B_ORIGIN_2_2	0.0607	0.0933	0.65	0.52
18	B_ORIGIN_3_1	1.01	0.392	2.58	0.01
19	B_ORIGIN_3_2	0.868	0.146	5.93	0.00
20	B_ORIGIN_4_1	-1.96	0.391	-5.02	0.00
21	B_ORIGIN_4_2	-0.0850	0.202	-0.42	0.67
22	B_PRICE_1	-5.03	1.72	-2.93	0.00

23	B_PRICE_2	-1.68	0.514	-3.26	0.00
24	B_PRICE_CUBIC_1	-7.17	3.86	-1.86	0.06
25	B_PRICE_CUBIC_2	10.5	2.82	3.72	0.00
26	B_PRICE_SQUARED_1	-5.12	4.28	-1.20	0.23
27	B_PRICE_SQUARED_2	-1.36	1.01	-1.34	0.18
28	B_SUGGESTION_1	1.13	0.231	4.90	0.00
29	B_SUGGESTION_2	0.520	0.143	3.63	0.00

Summary statistics

Number of observations = 3949

Number of excluded observations = 1181

Number of estimated parameters = 29

$$\begin{aligned} \mathcal{L}(\beta_0) &= -2741.215 \\ \mathcal{L}(\hat{\beta}) &= -2200.986 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 1080.457 \\ \rho^2 &= 0.197 \\ \bar{\rho}^2 &= 0.186 \end{aligned}$$

A.5.2 Italy

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1_1	0.0572	0.0953	0.60	0.55
2	ASC_ALT1_2	0.266	0.0926	2.88	0.00
3	ASC_CLASS	-1.07	0.821	-1.30	0.19
4	B_DEM_AGE	-0.0130	0.0122	-1.06	0.29
5	B_DEM_DRINKINGFREQUENCY	0.0299	0.131	0.23	0.82
6	B_DEM_INCOME	0.0599	0.0639	0.94	0.35
7	B_DEM_INTEREST	-0.0987	0.199	-0.50	0.62
8	B_DEM_MALE	0.0751	0.293	0.26	0.80
9	B_DEM_UNIVERSITY	0.0444	0.325	0.14	0.89
10	B_FAMILY_1	0.628	0.350	1.80	0.07
11	B_FAMILY_2	0.640	0.219	2.92	0.00
12	B_FAMILY_X_PRICE_1	-0.359	0.419	-0.86	0.39
13	B_FAMILY_X_PRICE_2	-0.406	0.209	-1.95	0.05
14	B_MEDAL_1	0.702	0.158	4.45	0.00
15	B_MEDAL_2	0.806	0.139	5.81	0.00
16	B_ORIGIN_2_1	0.873	0.204	4.27	0.00
17	B_ORIGIN_2_2	1.68	0.207	8.13	0.00
18	B_ORIGIN_3_1	-0.0169	0.275	-0.06	0.95
19	B_ORIGIN_3_2	-1.53	0.180	-8.50	0.00
20	B_ORIGIN_4_1	0.171	0.317	0.54	0.59
21	B_ORIGIN_4_2	-1.81	0.230	-7.85	0.00
22	B_PRICE_1	0.798	0.732	1.09	0.28
23	B_PRICE_2	-0.667	0.858	-0.78	0.44
24	B_PRICE_CUBIC_1	3.42	6.80	0.50	0.62

25	B_PRICE_CUBIC_2	0.627	4.93	0.13	0.90
26	B_PRICE_SQUARED_1	-3.31	1.74	-1.90	0.06
27	B_PRICE_SQUARED_2	0.0470	2.12	0.02	0.98
28	B_SUGGESTION_1	0.623	0.178	3.50	0.00
29	B_SUGGESTION_2	0.334	0.112	2.99	0.00

Summary statistics

Number of observations = 4154

Number of excluded observations = 1026

Number of estimated parameters = 29

$$\begin{aligned} \mathcal{L}(\beta_0) &= -2873.473 \\ \mathcal{L}(\hat{\beta}) &= -1808.861 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 2129.224 \\ \rho^2 &= 0.370 \\ \bar{\rho}^2 &= 0.360 \end{aligned}$$

A.5.3 United States

Parameter number	Description	Coeff. estimate	Robust Asympt. std. error	t-stat	p-value
1	ASC_ALT1_1	0.286	0.0569	5.02	0.00
2	ASC_ALT1_2	-0.195	0.0885	-2.20	0.03
3	ASC_CLASS	1.70	0.684	2.48	0.01
4	B_DEM_AGE	-0.0233	0.00874	-2.67	0.01
5	B_DEM_DRINKINGFREQUENCY	0.00475	0.00294	1.62	0.11
6	B_DEM_INCOME	0.0452	0.0493	0.92	0.36
7	B_DEM_INTEREST	0.263	0.138	1.91	0.06
8	B_DEM_MALE	-0.469	0.254	-1.85	0.06
9	B_DEM_UNIVERSITY	0.239	0.287	0.83	0.40
10	B_FAMILY_1	0.605	0.0855	7.07	0.00
11	B_FAMILY_2	0.471	0.105	4.47	0.00
12	B_FAMILY_X_PRICE_1	0.00764	0.156	0.05	0.96
13	B_FAMILY_X_PRICE_2	-0.480	0.261	-1.84	0.07
14	B_MEDAL_1	0.562	0.0646	8.69	0.00
15	B_MEDAL_2	0.255	0.0909	2.81	0.00
16	B_ORIGIN_2_1	-0.0833	0.0692	-1.20	0.23
17	B_ORIGIN_2_2	0.102	0.156	0.65	0.52
18	B_ORIGIN_3_1	-0.417	0.0887	-4.70	0.00
19	B_ORIGIN_3_2	-0.0214	0.159	-0.13	0.89
20	B_ORIGIN_4_1	0.117	0.0772	1.51	0.13
21	B_ORIGIN_4_2	0.856	0.176	4.86	0.00
22	B_PRICE_1	0.789	0.468	1.68	0.09
23	B_PRICE_2	-5.29	0.922	-5.74	0.00
24	B_PRICE_CUBIC_1	-4.37	3.14	-1.39	0.16

25	B_PRICE_CUBIC_2	11.2	4.41	2.54	0.01
26	B_PRICE_SQUARED_1	-0.392	0.716	-0.55	0.58
27	B_PRICE_SQUARED_2	-3.83	1.49	-2.57	0.01
28	B_SUGGESTION_1	0.756	0.0989	7.64	0.00
29	B_SUGGESTION_2	0.459	0.177	2.60	0.01

Summary statistics

Number of observations = 4581

Number of excluded observations = 519

Number of estimated parameters = 29

$$\begin{aligned} \mathcal{L}(\beta_0) &= -3167.573 \\ \mathcal{L}(\hat{\beta}) &= -2805.665 \\ -2[\mathcal{L}(\beta_0) - \mathcal{L}(\hat{\beta})] &= 723.816 \\ \rho^2 &= 0.114 \\ \bar{\rho}^2 &= 0.105 \end{aligned}$$

A.6 Choice frequencies: manifest variables

Table A.10: Choice frequencies of manifest variables by response levels

		Response						
Construct	Item	1	2	3	4	5	6	7
Behavioural loyalty	1	34	95	147	768	823	773	442
	2	20	47	75	416	864	994	666
Attitudinal loyalty	1	79	167	256	751	723	691	415
	2	112	179	430	585	785	634	357
Satisfaction	1	9	23	42	180	725	1306	797
	2	9	16	54	200	799	1230	774
	3	13	46	109	442	814	1072	586
Trust	1	9	21	39	407	770	1118	718
	2	12	18	46	434	720	1159	693
	3	9	8	31	493	741	1114	686
Uniqueness	1	16	89	195	663	905	803	411
	2	22	98	225	692	863	750	432
	3	22	120	244	786	832	676	402
	4	38	115	261	781	817	688	382
Social image	1	202	198	191	1186	471	519	315
	2	178	195	219	1123	516	565	286
	3	82	106	115	719	791	806	463
	4	169	177	197	1109	530	607	293
Perceived quality	1	26	54	125	562	851	963	501
	2	51	110	232	897	743	705	344
	3	29	73	157	744	829	844	406
	4	15	37	72	408	865	1055	630
Localness	1	18	41	99	562	802	969	591

	2	16	46	102	598	725	956	639
Corporate social responsibility	1	12	18	55	919	718	872	488
	2	24	55	121	1225	607	655	395
	3	13	19	54	975	656	901	464
Long-term orientation	1	26	56	145	1491	507	555	302
	2	9	27	53	993	672	826	502
	3	7	25	52	1019	682	814	483
Customer orientation	1	3	13	44	972	549	871	630
	2	3	18	58	939	619	890	555
	3	6	14	58	694	723	966	621
Family firm identity	1	144	193	191	533	576	800	645
	2	115	188	199	488	644	833	615
	3	127	197	221	566	608	764	599

n=3082

A.7 Measurement invariance for latent means model

Table A.11: Measurement invariance models for firm type group variable: All countries

	Model	LR (df)	p	RMSEA	CFI	Δ_{CFI}
Group	Pooled	6274 (564)		0.056	0.946	
	Family winery	3825 (564)		0.059	0.935	
	Corporate winery	3650 (564)		0.057	0.945	
Invariance	Configural	7475 (1128)		0.058	0.940	
	Weak	7540 (1152)	0.000	0.058	0.940	0.000
	Strong	7695 (1176)	0.000	0.058	0.938	0.001
	Strict	8304 (1212)	0.000	0.059	0.933	0.005
	Structural	9391 (1224)	0.000	0.064	0.922	0.011

Note: robust adjustment of RMSEA and CFI for non-normality; LR is the non-scaled test statistic; p computed according to Satorra and Bentler (2001)

Table A.12: Measurement invariance models for firm type group variable: Australia

	Model	LR (df)	p	RMSEA	CFI	Δ_{CFI}
Group	Pooled	2741 (564)		0.058	0.937	
	Family winery	1800 (564)		0.060	0.930	
	Corporate winery	1826 (564)		0.059	0.933	
Invariance	Configural	3626 (1128)		0.059	0.932	
	Weak	3667 (1152)	0.034	0.059	0.931	0.001
	Strong	3744 (1176)	0.000	0.059	0.929	0.002
	Strict	3966 (1212)	0.000	0.060	0.925	0.005
	Structural	4401 (1224)	0.000	0.066	0.910	0.015

Note: robust adjustment of RMSEA and CFI for non-normality; LR is the non-scaled test statistic; p computed according to Satorra and Bentler (2001)

Table A.13: Measurement invariance models for firm type group variable: Italy

	Model	LR (df)	p	RMSEA	CFI	Δ_{CFI}
Group	Pooled	2804 (564)		0.059	0.942	
	Family winery	1766 (564)		0.058	0.937	
	Corporate winery	1849 (564)		0.060	0.940	
Invariance	Configural	3615 (1128)		0.059	0.939	
	Weak	3645 (1152)	0.325	0.058	0.939	0.001
	Strong	3727 (1176)	0.000	0.059	0.937	0.000
	Strict	3996 (1212)	0.000	0.060	0.931	0.002
	Structural	4429 (1224)	0.000	0.066	0.917	0.005

Note: robust adjustment of RMSEA and CFI for non-normality; LR is the non-scaled test statistic; p computed according to Satorra and Bentler (2001)

Table A.14: Measurement invariance models for firm type group variable: United States

	Model	LR (df)	p	RMSEA	CFI	Δ_{CFI}
Group	Pooled	2647 (564)		0.057	0.947	
	Family winery	1923 (564)		0.063	0.926	
	Corporate winery	1697 (564)		0.055	0.952	
Invariance	Configural	3621 (1128)		0.060	0.940	
	Weak	3659 (1152)	0.034	0.059	0.940	0.000
	Strong	3734 (1176)	0.000	0.059	0.938	0.002
	Strict	3961 (1212)	0.000	0.061	0.934	0.005
	Structural	4236 (1224)	0.000	0.064	0.925	0.008

Note: robust adjustment of RMSEA and CFI for non-normality; LR is the non-scaled test statistic; p computed according to Satorra and Bentler (2001)

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