Assessment of Responsible Innovation

Methods and Practices

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6 Do voluntary standards support responsible innovation implementation and reporting in industry?

The case of the European food sector

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6.1 Introduction

Over the last years, Responsible Research and Innovation (RRI) has strongly emerged as a way to tackle the grand challenges of our time. These grand challenges (e.g. climate change, socio-economic inequality or the obesity epidemic, among many others) require the intervention of several societal actors and the development of new, innovative solutions. Industry actors, as one of the major players of innovation, are presented with an opportunity to contribute to the solution of such problems while cultivating their competitive advantage (Von Schomberg, 2013). In order to do so, RRI proposes a transparent, democratic innovation process whereby stakeholders are mutually responsive and which aims to yield ethically acceptable, socially desirable and sustainable outputs that tackle the grand challenges of our time (Von Schomberg, 2013).

Responding to socio-ethical issues through transparent, democratic and mutually responsive innovation processes has often proven a struggle for industry. This has operationalised in several concepts as value-sensitive design, closely connected to responsible innovation (van den Hoven, 2013). This approach acknowledges that products and technologies are value-laden; that is, they reflect societal values in their design. A classic example is the 'racist bridges' in Long Island, NY, USA, which were designed deliberately too low to allow buses (the mode of transportations used by poor blacks and Puerto Ricans) to reach the beach. Therefore, values can be reflected in innovation, but transparent and democratic processes are necessary to identify which values are shared by society. However, there are certain difficulties to translate values in commercial innovation processes: apart from problems derived from information asymmetries and different degrees of responsibility among the intervening stakeholders (Blok & Lemmens, 2015), the complexity of introducing several (and often contradicting) voices in the deliberation process may conflict with the desirable time to market in competitive environments.

One of the governance mechanisms suggested to simplify the process of RRI to make it more compatible with commercial innovation is the use of voluntary standards for product development (Von Schomberg, 2013; Iatridis & Schroeder, 2016; Voegtlin & Scherer, 2017). Voluntary standards are a mechanism of soft law through which businesses bind themselves to certain criteria for the achievement of a common goal (Brunsson & Jacobsson, 2002; Kirton, Trebilcock, & Trebilcock, 2017). The rationale for the possible role of voluntary standards is that they provide companies with guidelines for responding to socio-ethical issues in the innovation process and its outcomes, while greatly reducing the procedural burden that a case-to-case response may entail.

In case of business-to-consumer products, voluntary product standards often come attached to a form of certification that can be easily recognised by the customer, the so-called front-of-pack (FoP) labels. Many studies have been conducted on the influence of voluntary standards on product innovation and their positive influence on the profitability of companies (Besen & Farrell, 1994; Acemoglu, Gancia, & Zilibotti, 2012). In particular, FoP labels could be beneficial for this purpose as they allow producers to communicate their certification to consumers and show their awareness and responsiveness towards particular socio-ethical issues, which might appeal to a certain customer segment (Nikolaeva & Bicho, 2011; Kleef & Dagevos, 2015). However, there is little (and inconclusive) evidence on the utility of voluntary product standards when directing innovation towards addressing grand challenges (Rennings, 2000). Thus, the value of voluntary product standards to integrate societal values in innovation practices needs to be further investigated and examined in practice. In this chapter we critically examine the potential of voluntary product standards as an RRI governing mechanism. The question that we are aiming to answer with the case study of the European food industry is: How do FoP labels based on voluntary product standards support RRI implementation and reporting in industry?

In order to do so, we first provide an overview of the literature that describes the supportive mechanisms of voluntary standards for RRI as well as possible drawbacks. Then we connect theory with industry practice by presenting a case study with data from seven European food companies on the adoption of FoP labels. We end this chapter with a comparison of the theory and our case study results, drawing preliminary conclusions and suggesting further research on the role of voluntary standards for target setting, monitoring and assessment in the governance of RRI in industry.

6.2 Voluntary standards as an RRI practice

6.2.1 Classifications of voluntary standards

The use of voluntary standards has greatly increased in industry in the last years (Hughes, Buttle, & Wrigley, 2007; Nadvi, 2008), since they respond to

multiple needs of industry, from the absence of strong authorities to legislate or enforce laws and regulations in a globalised economy (Nadvi, 2008) to the will to pre-empt new, harder regulations from coming into place through the use of alternative standards (Okhmatovskiy & David, 2011). Typically, the socio-ethical issues addressed in these standards are not directly observable by customers and stakeholders, and for reasons of transparency and competitive advantage, these standards 'flag to customers and other stakeholders that producers or traders who adopt ... standards show a higher socioenvironmental performance than their uncertified counterparts' (Wijen, 2014, p. 303).

Voluntary standards can be categorised according to three characteristics: (1) the aspect of a company they assess; (2) the range of companies they assess; (3) the actor(s) that develop them and/or monitor their compliance (Wijen, 2014). Regarding which aspect of business voluntary standards assess, a distinction can be made between management standards and product standards. Management standards assess whether the business practices of the company are conducted in a way that addressed socio-ethical issues, such as protection of the natural environment, the protection of the human rights of employees or the mitigation of climate change (Wijen, 2014). Examples of voluntary management standards are ISO 14001 for international environmental management, ISO 9001 for international quality management and Fair Trade certification (Christmann & Taylor, 2006; Delmas & Montes-Sancho, 2011; Wijen, 2014). Product standards assess the final outcome of a company's business practices, also referred to as absolute performance requirements (Wijen, 2014). These standards assess the impact of a specific product on the socio-ethical issues. Examples of voluntary product standards are the standards of the Forest Stewardship Council (FSC) and the standards of the Marine Stewardship Council (Wijen, 2014; Moog, Spicer, & Böhm, 2015a). As one product of a company might comply with the product standard while another does not, the certification of product standards is often combined with a FoP label (Boström, 2006; Van Kleef & Dagevos, 2015). Concerning the range of standards, they can apply to one specific company, to a whole sector or even extend across sectors (Wijen, 2014). Furthermore, for their geographical range, scholars often make a distinction between international and national standards. Finally, the governance of voluntary standards can be categorised into structures with only one type of actor – such as trade organisations representing multiple companies – or a combination of multiple types of actors, referred to as a multi-stakeholder initiative or agreement (MSA) (Fransen & Kolk, 2007; Wijen, 2014).

6.2.2 The potential role of voluntary standards in RRI

The RRI framework calls for a transparent, democratic and mutually responsive innovation process (Von Schomberg, 2013; Blok & Lemmens, 2015). Following these principles, Stilgoe, Owen, and Macnaghten (2013) developed

a framework of RRI that envisions four dimensions to be addressed: anticipation, inclusion, reflexivity and responsiveness. Anticipation refers to foresight tools and techniques that aim to predict, to the extent possible, the unintended consequences of the innovation, hence providing with governance mechanisms to understate future dynamics created by the innovation and in which the innovation will operate. Inclusion aims to remove traditional top-down streams in innovation goal-setting, integrating different stakeholders in the innovation process in order to better reflect and incorporate on societal values. Reflexivity is related to the ability of the intervening actors to be self-critical and mirroring the conclusions in the other dimensions in their actions. Moreover, second-order reflexivity can be built through standards or codes of conduct (Von Schomberg, 2013). Finally, responsiveness is related to the ability to respond and incorporate the requirements identified through anticipatory, inclusive and reflective measures in the innovation process, hence materialising in the final result.

Voluntary standards constitute a collaborative mechanism to address socio-ethical challenges through product innovation, and they are suggested to overcome the process of deliberation and facilitate the materialisation of socio-ethical objectives in the innovation process, by providing a soft-law governance system (Voegtlin & Scherer, 2017). In that sense, they level the competitive ground on socio-ethical issues, without the burden of engaging in costly deliberative processes individually, while promoting self-reflexivity (enhancing the capability of the company to reflect on its RRI performance as compared to the benchmark). The use of FoP labels, which are the result of compliance with product development standards, increases transparency towards consumers (Verbeke, 2005), hence constituting an element of direct reporting of RRI activities to consumers.

Moreover, multi-stakeholder-based standard setting is suggested to help overturn existing power structures, allowing non-traditional players to raise their voice in commercial innovation processes and have their interests considered further than they would be in other forms of stakeholder consultation (Mena & Palazzo, 2012; Ponte & Cheyns, 2013). Voluntary standards are often developed by MSAs, with the increasing participation of non-governmental organisations (NGOs) and other social stakeholders (Fransen & Kolk, 2007). In this sense, collaborative standard setting breaks business boundaries, by inviting different actors to the drafting of self-regulations. This is consistent with the inclusion dimension of RRI (Stilgoe et al., 2013), which was originally conceived for technology development in non-commercial environments (for instance, basic development of nanotechnologies). The progression down the innovation cycle to the competitive stage, where industry actors further develop these technologies for commercial purposes, changes the levelling ground and comes with additional challenges for stakeholder engagement. Hence multi-stakeholder-based drafting of voluntary standards makes stakeholder engagement feasible in an industry context: stakeholder involvement occurs in the early stage to develop criteria

for innovation. Including stakeholder voices through standards can be a good way of overcoming the extra burden placed by inclusion measures on businesses, which often affects their ability to compete in the market (Blok & Lemmens, 2015). The development of these standards, and their adaptation to local markets and changing stakeholders' views is a time-consuming and complex effort also at the network level; therefore, MSAs are often constituted, providing a permanent governance structure that revises and adapts the standards over time: the success of the standard will also rest on the capacity (Ponte & Cheyns, 2013). Setting up a more permanent structure for dialogue allows for interaction and negotiation to revise standards and introduce elements of the collective deliberation advocated by the RRI framework, as well as providing mechanisms for certification and compliance (Gurzawska, Makinen, & Brey, 2017).

Blok and Lemmens (2015) indicate that such a process is at odds with actual commercial innovation practices. Voluntary product standards governed by MSAs have been suggested as a solution for overcoming each of these barriers (Von Schomberg, 2013; Blok, Hoffmans, & Wubben, 2015). First, for product innovation to contribute to the competitive advantage of a company, the innovation process is required to be relatively low-cost and have a short time to market to pre-empt competitors. Blok and Lemmens (2015) argue that the inclusive deliberation processes required for RRI are often lengthy and costly and will thus eliminate any competitive advantage of innovation. The second argument of Blok and Lemmens (2015) concerns the industry actors' need for information asymmetries to build a competitive advantage, which conflicts with the principle of transparency. Oversharing information and the risk of knowledge leaks to competitors through the deliberation process can be detrimental for the company's competitive advantage, particularly when no specific arrangements are made. In this regard, the standards frameworks can provide mechanisms for protection of intellectual property. Third, the power imbalances between companies – which carry the liability and financial burden of the innovation – and other stakeholders involved – which often do not financially contribute to innovation – trump the principle of mutual responsiveness on which RRI is built (Blok & Lemmens, 2015).

Voluntary standards can overcome the barrier regarding the time to market by targeting the whole sector at once. Thereby, any company that decides to bring a product to the market before the standards are completed runs the risk of having to reformulate the product at a later stage to make it comply. Potential benefits of being first to market are eliminated by the cost of reformulation. When it concerns re-accreditation after standard adjustment, the MSA has the option to allow a time lag between the publication and re-accreditation of the standards, providing companies time to adjust their products before losing their certification and thereby not interfering with the product innovation process of companies. The governance structure of the MSA can also soften the financial impact of inclusive deliberation processes by dividing the cost among the participating actors.

Consequently, voluntary standards for product development have an added value in the implementation of RRI in industry (Iatridis & Schroeder, 2016), since they perform a threefold mission: first, they support RRI reporting through certification and FoP labels, when compliance with the standards is audited and certified by an independent party or a permanent structure created ad hoc (Fulponi, 2006; Gurzawska et al., 2017). Second, they help to make the business case for RRI by helping to obtain a premium on sales price in the market, through the reporting of the RRI activities to consumers. Since certification and FoP labels report the efforts in the direction of including socio-ethical goals in the process, they have a direct effect on pricing (short-term advantage) and reputation (long-term advantage). Third, they help to set RRI targets that are incorporated in the innovation process. In fact, standardisation of product development can lead to more innovative outcomes through agenda setting and application of innovative methods (Inoue, Arimura, & Nakano, 2013; Amores-Salvadó, Martin-de Castro, & Navas-López, 2015). Studies in the environmental sustainability field have shown that the use of voluntary standards as part of environmental management systems has been positively related with the development of green innovation capabilities (Amores-Salvadó et al., 2015); with the development of green process innovations (Wagner, 2008); and with the profit maximisation of such innovations (Inoue et al., 2013).

In the case of standards for societal values it is argued that leaving standardisation to industry players may lead to socially undesirable results. The development of voluntary standards through MSAs supports companies in the daunting task of balancing the interests of different stakeholders and contributing to the inclusion of certain societal values in their products or services (King, Lenox, & Terlaak, 2005; York, Vedula, & Lenox, 2017), while providing compliance mechanisms(Ponte & Cheyns, 2013). The power imbalances can be softened by voluntary standards, as they can serve as a form of social contract between the involved stakeholders (Giovannucci & Ponte, 2005). Thereby, the non-commercial stakeholders will also connect their name to the initiative and the outcomes of the standards will thus impact their own legitimacy. That this impact can be both positive and negative can be seen with the Rainforest Alliance, an NGO that has set management and product standards in collaboration with several multinational enterprises and has received both praise and criticism for its role (Scherer, Palazzo, & Seidl, 2013). In this manner, the responsibility for developing the standards and assessing compliance lies with various societal actors, instead of businesses only. Nevertheless, as explored in the next sections, multiple shortcomings for voluntary standards as a mechanism for RRI in industry have been identified as well.

6.2.3 The drawbacks of voluntary standards as RRI instrument

Despite their potential contribution to responsible outcomes, the legitimacy and internal governance of voluntary standards are often questioned

(Vogel, 2010; Kleef & Dagevos, 2015). As previously mentioned, voluntary standards can support the implementation of RRI if they are based on multi-stakeholder engagement, including not only industry, but also NGOs, policy-makers and consumer associations. This allows for the multidimensionality that tackling complex problems entails (Schouten & Glasbergen, 2011), which includes the integration of social and technological concerns in innovation, or trade-offs between economic and social interests. However, the setting of voluntary standards has traditionally been considered a private-sector activity: a form of self-regulation in the absence of state regulation or as a corporate response to societal activism for a certain cause (Ponce del Castillo, 2010). When engagement of stakeholders is initiated, financed and conducted by industry players, it may lead to a bias in representation of unfavourable, marginal or overly critical societal actors (Fransen & Kolk, 2007; Roloff, 2008). Therefore, although these industry-led initiatives are prevalent, their moral legitimacy is highly questioned because of their selective representation of interests (Suchman, 1995; Fransen & Kolk, 2007), even when accreditation is left to third parties and appropriate measures for multi-stakeholder decision-making are in place (Bäckstrand, 2006; Thabrew, Wiek, & Ries, 2009). These issues of representativeness of different societal actors and interests in the development of voluntary standards can be particularly troubling when FoP labels are associated with them, since FoP labels grant an increased degree of trust from the consumer, although the standards may have not been evaluated and approved by a significant representation of societal actors.

To overcome these issues of illegitimacy and to contribute to responsible outcomes, voluntary standards need to be governed by MSAs that are characterised by: (1) balanced representation; (2) structures that assure deliberative communication and decision-making; and (3) systems for monitoring or verification of corporate behaviour (Scherer & Palazzo, 2008; Moog et al., 2015). In practice, however, difficulties with these three characteristics hinder the involvement of NGOs and government representatives in the development and monitoring of the standards (Moog et al., 2015). First, the balanced representation is hindered by the large organisational burden of MSAs, which leads to high resource demands for its participants. Membership is thus easier for larger organisations, as they have more resources to spare. In practice, this has led to under-representation of both small, local companies and small, local NGOs – e.g. underrepresentation of small farms in the Roundtable of Responsible Soy (García-López & Arizpe, 2010; Schouten, Leroy, & Glasbergen, 2012) and overrepresentation of WWF, Greenpeace and Amnesty International in MSAs (Fransen & Kolk, 2007). While RRI may open the innovation process for other stakeholders through deliberation, this deliberation may still disproportionately favour the larger players due to the resources required for participation. This underrepresentation not only leads to a less inclusive process, but also decreases the success of local implementation of the

standards. To include local companies and NGOs, the larger organisations will be required to contribute more resources to the MSAs. However, this will create a power imbalance, as was the case with the FSC case in the long term (Moog et al., 2015).

Second, the procedural legitimacy of MSAs for voluntary standards is often criticised because of its lack of transparency (Auld & Gulbrandsen, 2010), despite this being a crucial element of RRI (Stilgoe et al., 2013). The reason for this lack of transparency can be found in the need to reach agreement across stakeholders about the details of the standards. For this purpose, the actors involved need to be encouraged to reflect on their views and possibly reconsider them to get closer to the views of the opposing actors (Owen et al., 2013). Such reflexive processes and reconsiderations are easier to achieve in closed-door negotiations because then 'negotiators can freely exchange ideas and thoughts more easily than in the public sphere where they have to stick to their guns' (Risse, 2004, p. 312). Furthermore, the act of reconsidering their views might also be easier for companies than for NGOs. While the reputation of companies is often positively influenced by MSA participation, an NGO's reputation can be threatened when they are seen to be compromising towards companies (Moog et al., 2015). The reputation of the NGO is based upon their ability to act upon a socio-ethical issue and business is often seen as the source of the issue at stake. The main purpose of companies is often portrayed as providing economic welfare and, although the social reputation of a company might be damaged, non-compliance with the standards can always be excused by the financial risk compliance brings. Although these conditions count for any MSA, the objective of RRI to govern innovation brings in an additional difficulty: the novelty of innovation creates uncertainty about future outcomes. Even if the standards are very detailed, the mere implementation of them can have unforeseen consequences due to the complex nature of grand challenges (Blok & Lemmens, 2015). The combination of this need for consensus and this uncertainty is shown to be a reason for NGOs not to participate, considering the multiple tensions that the involvement of stakeholders brings in the innovation process (see, also for a case in the food industry, Blok et al., 2015).

Third, the daunting task of monitoring and verification is often carried out by independent bodies (Albareda, 2013; Gurzawska et al., 2017). Due to the lack of impartiality of companies and the lack of resources of other actors, professional auditing organisations are tasked with monitoring the implementation of the standards in many MSAs. Although independent, the FSC case has shown that the influence of these auditors on the standard formulation increases over the years, often at the expense of the influence of non-industry representatives (Moog et al., 2015). Thereby, the different viewpoints that are necessary for the success of the voluntary standards in terms of integration of socio-ethical issues are often overlooked (Meybeck & Redfern, 2014). Additionally, to govern the uncertain nature of innovation, it is not only important to monitor compliance with the standards,

but also the often unforeseen consequences of their implementation to the grand challenges. In the case of voluntary standards for RRI, this monitoring system could therefore become extensive and difficult to manage. The costs of developing such a monitoring system are in MSAs often covered by the initiating partners. Although inclusiveness is important for RRI, any actors that join the initiative at a later stage can be viewed as free-riders, making the MSA less open for new members and thus limiting its growth potential (Delmas & Keller, 2005).

The final potential drawback of voluntary standards lies in their effectiveness to result in more socially desirable, ethically acceptable and sustainable outcomes. Even if there is no previous empirical evidence focused primarily on RRI and voluntary product development standards, research on voluntary management standards for sustainability challenges shows that, while adherence to them is often high, the lack of enforceable sanctions in case of underperformance reduces their effectiveness (Ruysschaert & Salles, 2014). For product standards, however, it must be noted that MSAs can have strict rules for compliance, which result in removal of the FoP label (e.g. the label 'organic' or 'fair trade') (Boussalis, Feldman, & Smith, 2018). For RRI, the need to be responsive to the consequences of innovation requires the standards to be highly dynamic, focusing more on product *improvement* then meeting threshold requirements (see for instance the case of the Choices' logo for healthy food in the Netherlands: Garst, Blok, Jansen, & Omta, 2017). This adds another difficulty for consistent sanctioning practices. Without these sanctions, however, a company can enjoy the reputational benefits of engaging in a voluntary standards programme (Nikolaeva & Bicho, 2011) while keeping them at the periphery of their business operations (Vogel, 2010).

To summarise, literature theorises that voluntary product standards governed by MSAs and combined with FoP labels for public communication could potentially have a supportive role for RRI implementation in industry, but at the same time might not overcome all barriers and might even create new hurdles. Although some empirical evidence on the effectiveness of voluntary product standards and FoP labels exists (Brunsson & Jacobsson, 2002; Iatridis & Schroeder, 2016), their role in RRI implementation has not been empirically investigated. We critically examine how voluntary standards may support RRI reporting through a case study on the use of FoP labels in the food industry and compare these results with another illustrative example: the standards for the use of nanoparticles in cosmetics.

6.2.4 Application of voluntary standards for RRI: the use of front-of-pack labels in the food industry

To address many socio-ethical issues that it faces, the food industry has widely adopted voluntary product standards associated with FoP labels. One of the grand challenges that RRI aims to address is the increase of diet-related

non-communicable diseases (e.g. obesity, cardiovascular disease and type 2 diabetes). In the context of the food industry, FoP labels are developed to increase transparency for the consumer through the provision of comparable information, to facilitate interaction through formal socialisation mechanisms and to enhance responsiveness via monitoring, assessment and objective target setting, which are important stakeholder engagement practices in RRI practice (Blok et al., 2015).While FoP labels are also used by the food industry to communicate about other societal values (e.g. fair-trade origin, animal welfare), the labels aimed at the health of the consumer are unique for this industry and have an increasing presence (Kleef & Dagevos, 2015). In the European context, policy-makers and scientific institutions as well as NGOs often collaborate in the development of the standards used for the certification of an FoP label (Brunsson & Jacobsson, 2002; Leipziger, 2010). Therefore, to investigate the use of standards for incorporating societal values in innovation processes, we draw upon examples from practice, using the food industry and their consumer-related health standards as an illustrative case.

6.3 Methods

To gather examples on the use of FoP labels in the food industry, we conducted in-depth interviews with innovation managers of seven European food companies of different sizes. To select the cases, we used a non-probabilistic purposive sampling method. To allow for verification of observations between companies and to identify contextual characteristics that influence observations, both similar and contrasting cases were selected (Miles, Huberman, & Saldaña, 2013). To ensure case similarity and relevance to the research question, the selection criteria were: companies (1) that are part of the food and beverage processing and manufacturing sector (for definition see: Lehtinen et al., 2016); (2) that are located in Europe and operating in the Netherlands; (3) that have shown activity in healthier product innovation; and (4) that have adopted FoP labels regarding the nutritional composition of their products. To provide contrast, the selected companies differed in size, geographical market and product range. The cases were selected from the membership list of the Dutch branch organisation for food manufacturers and their websites were used to determine their fit with the selection criteria. We selected the case of the Dutch food industry not only based on convenience sampling, but also because of the existence of FoP food labels for healthier products, and because of the prevalence of the food industry and the effect of its practices on health in the nationwide debate (de Vries, de Hoog, Stellinga, & Dijstelbloem, 2016). In total 21 companies were contacted, of which seven agreed to take part in the study. The main features of the respondent companies are summarised in Table 6.1. To ensure confidentiality, the names of the companies and their brands are anonymised.

The semi-structured interviews were conducted in English through Skype or face to face with an average duration of 40 minutes. The interviews

Table 6.1 Main features of sample companies

Case	*Geographical market*	*Product range*
Company A	Europe	Freshly preserved vegetables and fruits
Company B	Worldwide	Production, development and packaging of meat substitutes
Company C	The Netherlands	Bakery products
Company D	Worldwide	Fresh, frozen and dried potato products
Company E	The Netherlands	Chilled soups, sauces and meal components
Company F	Europe	Preserved fruits, vegetables and pulses
Company G	Worldwide	Pasta, ready-to-use sauces and bakery products

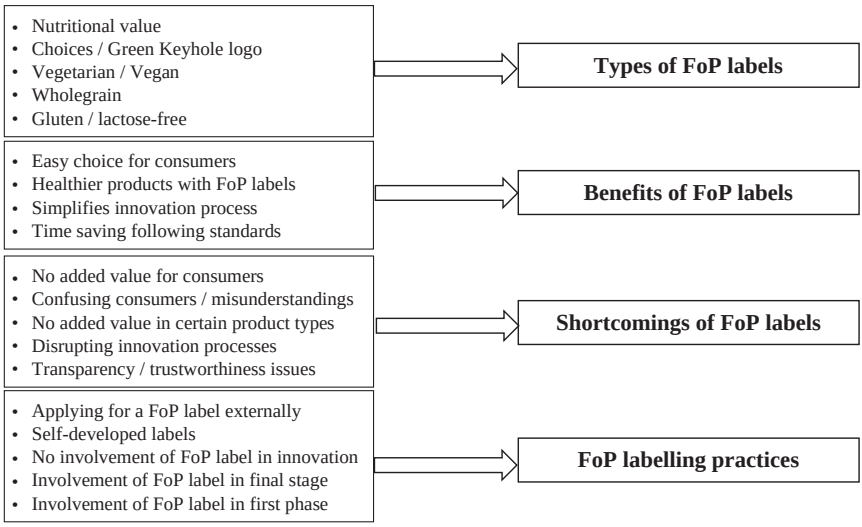

Figure 6.1 The coding tree used for data analysis.
Note: FoP, front-of-pack.

were semi-structured to examine specific topics, mainly the advantages and disadvantages presented in the previous section, but to still be open to for diverging topics that might extend existing theories (Bryman, 2011). To ensure the trustworthiness of the observations by the interviewees, the factual data were triangulated with secondary data, such as company websites, newspaper articles and industry reports. We transcribed the interviews verbatim and analysed the transcripts through inductive-deductive codification, data-driven but guided by the literature across coding cycles (Pratt, 2009) using the software Atlas.ti (ATLAS.ti Scientific Software Development GmbH, 2013; Gioia, Corley, & Hamilton, 2013). This allowed for the development of categories and the identification of patterns within the sample. The coding tree can be found in Figure 6.1.

6.4 Findings

The interviews partially confirmed that FoP labels played a significant role in translating the value 'improving health' into specific design requirements that could be directly implemented during product development, such as reduced sugar and fat levels. By taking over the search for consensus on the definition of health, the governance system behind FoP labels alleviated the companies from the need to navigate conflicting stakeholder views. In this manner, FoP labels seem to support the implementation of RRI. However, the participants nuanced this vision as well, showing that it also comes with attached hurdles. One of the difficulties of the integration of the societal value 'public health' in product innovation according to the companies in our case study is the abstract nature of the concept 'health' and the many views in society on how it relates to food products. Translating these abstract values was seen by the companies as a cumbersome process involving continuous stakeholder engagement, as illustrated by Company A:

> The different angles to look at healthiness of a product makes it more complex…So, what we are focusing on is telling people what it is, and we try to add as less salt as possible but it needs to be tasty because otherwise people don't eat it so you can make a very healthy product but if nobody eats it makes no sense.

These processes did not fit in their drive towards lean and efficient product development processes. However, the product standards helped them by providing clear guidelines useful in navigating these divergent views.

However, the use of voluntary product standards with FoP labels, while helpful in incorporating values in the innovation process, did not lead to companies directly participating in inclusive deliberation, since this task was mainly conducted by the MSA. Moreover, most of the companies in the sample doubted whether the FoP labels that they were currently deploying were developed in a sufficiently inclusive manner, considering the little diversity of stakeholders involved in the development of the standard, and the little space for direct stakeholder engagement beyond the application of the standard as a second-order reflexivity measure. The companies used the voluntary product standards (developed by the government or governmental agencies); only one of them additionally consulted a roundtable of scientific researchers throughout the three stages of the innovation process (conceptualisation, development and commercialisation). In cases when an external organisation was consulted – for instance, in order to be able to utilise the 'vegan' FoP label – these were only consulted in the final, validation phase of the project.

Therefore, the participation of stakeholders external to the innovating company was rather minor and limited to the final stages. In this manner, the deliberation and inclusion dimensions of RRI were somehow externalised

to the MSA, hence reducing the active agency of the firm in incorporating RRI principles, but helping to overcome some of the barriers for RRI implementation in industry (Blok & Lemmens, 2015). Only companies B and F indicated that for some FoP labels they inquired about the standards in the ideation phase of their innovation process. The main argument given for not using the voluntary product standards earlier in the process was their limiting effect on the creativity in the product innovation. Thereby, in our sampled companies, the criteria of the FoP labels only acted as a validation system for the innovation outcome and had only limited effect on the target setting of the innovation process.

This observation is consistent with the various companies' perception that stakeholder inclusion in the innovation process is cumbersome and disturbed the usual pace of the innovation process. This was a major reason why they used voluntary product standards instead of consultation or co-creation processes. Some other setbacks identified by the companies concern the marketing value of the FoP label, as raised by company A, despite their ability to convey instant information to the consumer, because the FoP labels made the packaging less attractive. Interestingly, most companies in the sample doubted the effectiveness of voluntary standards to produce healthier food outcomes (see Table 6.2).

The ability of FoP labels to promote self-reflexivity in companies can also be doubted, based on our data. When asked about the effectiveness of the FoP labels to promote healthy innovation, several companies indicated that the labels were not particularly useful as their company already had its own nutritional guidelines in place and therefore the FoP labels did not change their innovation processes. Even though they acknowledged the usefulness of stakeholder engagement for the legitimacy of FoP labels, only one company involved external actors in their development of their internal guidelines, in the form of an advisory board of nutrition scientists. The other companies did conduct stakeholder engagement activities, but not directly related to setting health standards for their innovation process. Besides inefficiency, their main argument for not involving stakeholders was the fear of losing control over the end-product. The companies indicated that they are responsible not only for developing the innovation, but also diffusing it. Letting other actors be directly involved in the innovation process and thus have ownership of the process was for the companies not a guarantee that these actors would also take responsibility for the societal impact of the end-product. As this product always carried their brand name, the ownership of the product lies with the companies and thus also the responsibilities for its societal impact. As illustrated by company F, it is difficult to share aims, outcomes, rewards and responsibilities beyond a punctual occasion: 'We try to understand what their [other stakeholders'] horizon is, but it is never co-operational like sharing, we share insights, but we do not deliver results together'.

Besides a role in making the innovation process more responsible, FoP labels are also suggested to promote responsible consumption by transparently

communicating the impact of the product on the socio-ethical issue at stake. On the one hand the companies in our case study indicated that the FoP labels indeed supported the communication of health messages to the consumer. On the other hand, they highly doubted whether the consumer understood that message and even suggested that the FoP labels might cause confusion. Three reasons were provided by the interviewees. First, although the FoP labels translated the abstract value to practical product requirements for the producers, when the label was printed on the package its simplicity did not communicate the standards it represented. Although a few FoP labels have now been developed that are more detailed, most labels do not allow consumers to compare their definition of health with label criteria. For instance, while the label 'organic' is relatively straightforward and criteria can be easily consulted, the criteria for the label 'healthy choice' are more blurred (e.g. is it healthy, or just healthier than an alternative?). Second, the number of FoP labels has increased over the years and the companies indicated that they perceived confusion among their consumers about the meaning of labels and the value they represent. Third, the increasingly globalised food market asks for global regulation of food labels. This is particularly challenging in this highly regulated sector, since degrees of food quality and safety vary from country to country, and consumer preference is very closely tied to local cultures. However, implementing such a system was indicated by the companies as a daunting task due to the many local differences, and limits the effectiveness of FoPs as a mechanism of RRI reporting.

A brief summary of the advantages and shortcomings raised in the literature and by the sample companies, accompanied by exemplar quotes, can be found in Table 6.2.

6.5 Discussion and conclusions: the future of voluntary standards as instrument for supporting RRI implementation and reporting in industry

Our study contributes to the study of the potential role of voluntary standards (and associated FoP labels) to support the implementation and reporting of RRI in industry. There are issues that emerge from the analysed cases that concern the value of voluntary standards for innovation and their effectiveness, and issues that are related to their value as mechanism for RRI assessment and reporting developed at the early stage of the innovation process.

Our results confirm the mixed trends in the literature, with some of the interviewees confirming the value of voluntary standards for the development of innovation – and most importantly, as a tool to integrate social values in innovation – and others noting how they can constitute obstacles for the innovation process. Albeit their value for objective target-setting and providing benchmarks (Vellema & van Wijk, 2015; York, Vedula, & Lenox, 2017), our research shows that voluntary standards are not per se sufficient for the operationalisation of RRI, and that the companies in our sample

Table 6.2 Benefits and shortcomings of front-of-pack (FoP) labelling practices as raised by the literature and the sample companies in the food industry

Advantages of FoPs identified by the sample companies	*Supported by*	*Exemplar quote*	*Main advantages of FoPs in the literature*
Facilitate the innovation process and save time	A, B	"… if those labels help us and they also help the consumers why not … we hope that it is positive and easier for people to select products…" (Company A)	Avoid costly individual (company-by-company) process of deliberation
Ease choice for consumers	A, B, C, D	"It is good to have criteria which state the health claim and then follow those on the development phase. It facilitates target setting" (Company B)	Increase transparency, providing comparable information to the consumer
			Fill in gaps where (often international) regulation is underdeveloped
			Facilitate stakeholder engagement
			Prevent power imbalances through the integration of various stakeholders in their development
			Enhance self-reflexivity
			Level the field for an industry
Shortcomings of FoPs identified by the sample companies	**Supported by**	**Proof quote**	**Main shortcomings of FoPs in the literature**

(*continued*)

Table 6.2 (*Cont.*)

Advantages of FoPs identified by the sample companies	*Supported by*	*Exemplar quote*	*Main advantages of FoPs in the literature*
Lack of transparency and / or trustworthiness	A, B, C, D, F	"yes, the trust of the people will increase, I think it will help. On the short term it might have a good effect. On the long term it would lead to less innovation because of its limits. A very controlled food system could lead to less innovation and a lot of bureaucracy, which is counterproductive" (Company F)	Lack of transparency during the development of the standards
Confuse customers and / or create misunderstandings	A, C, D, F, G	"in this moment the reality is very much fragmented between countries and as a company…we want to avoid increasing the complexity of reading all those FoPs from consumers" (Company G)	They can confuse consumers
Disrupt the innovation process	A, C, F	"I believe, that even a trustworthy labelling system would lead to less innovation because it limits always..." (Company F)	Their effectiveness has often been questioned
Make products less attractive	A	"so putting such labels on the products can be negative for people who just want to have a nice product… Logos are very ugly on the packaging" (Company A)	

perceive inclusion and deliberation as cumbersome in the innovation process despite the simplified mechanisms that FoP labels provide. Moreover, beyond taking the first steps in the inclusion of a certain value in the innovation process, complacency within the standards may lead to less innovative solutions for the challenge at hand.

The literature states certain benefits of engaging with voluntary standards in terms of establishing the business case of RRI. The companies in our sample confirmed this view, but also identified many shortcomings that show that the system of implementation of voluntary standards as a forum of RRI can be improved in order to adjust it to business realities. Companies see reputational gains as the major benefit of engaging with voluntary standards – rather than an increased capacity for RRI or a chance to remove obstacles for transparent and mutually responsive innovation process. These attitudes towards the voluntary standards show that the risk of their use by free-riders or as a greenwashing mechanism may be present (Risse, 2004; Moog et al., 2015), in line with the findings for other voluntary standards aiming to incorporate socially responsible or sustainable practices in business. Another major risk that has been identified in the cases, and which resonates with previous business engagement with social values – although not in the field of innovation (Delmas & Keller, 2005) – is that of the lack of transparency. The companies in the sample highlighted the remaining lack of access to information in the development process, which limits the trustworthiness towards the consumer and their value as an RRI reporting mechanism. The use of the label may veil the product under the category of 'healthier product', while there are no added health benefits to consuming that brand over others, creating a misleading 'fake transparency' effect that distorts the spirit of reporting of RRI activities to the consumer. This aspect was confirmed by our results, with several companies highlighting consumer confusion as a major shortcoming of voluntary standards. In addition, it was mentioned that the target-setting derived from the standards sometimes hindered or slowed down the innovation process. Even if this can be perceived as a problem from the perspective of RRI implementation in an ideal state, previous research shows that being able to be responsive to societal demands without needing to go through costly processes of stakeholder deliberation was a way in which industry has adopted RRI practices (Gurzawska et al., 2017).

The impact of these standards on the innovative capacity of a company or an industry is a controversial issue in the field of innovation. Despite the fact that values embedded in voluntary standards can span across business practices – e.g. the ISO 14000 standards for environmental management (ISO, 2009) – one of the most common practices targeted by standards is product development, which is the focus of this chapter. As noted by Wright, Sturdy, and Wylie (2012), standardisation implies working towards homogeneity and similarity in an industry. This intuitively goes against the narrative of status

quo-defying developments that often characterise the innovation discourse. In that regard, codes of conduct that provide general behaviour guidelines instead of specific product requirements have also been developed for certain sectors, either promoted by policy-makers or industry players (Blok, 2017). Choosing to adhere to existing rules in product development is said to have a detrimental effect on the ability to develop disruptive innovations, since it limits the ability of the innovator to break away from existing dynamics by locking her to a set of behaviour connected with preceding practices.

In a nutshell, our research examines how voluntary standards and associated FoP labels can support RRI implementation and reporting. Examining the case of the European food industry, we observed that, while there is great potential value in the use of voluntary standards and associated FoP labels for RRI standard setting and direct reporting to the consumer, RRI principles of transparency and mutual responsiveness are not being incorporated in practice. The FoP labels can be considered an instrument of RRI reporting (once it had been implemented, it could be easily communicated to the consumer), while they have less value as a lever for RRI practices. In summary, our data suggest that FoP labels do not stimulate stakeholder engagement and self-reflexivity within the sample companies, which puts their validity for the purpose of understanding other stakeholders' views at risk. In other words, FoP labels may support RRI adoption because they circumvent the problems associated with stakeholder engagement (increased complexity, lengthening of innovation process); however, the price to pay for RRI in industry while sustaining competitiveness is then the loss of inclusion. This shows that new ways to approach the development of standards is needed. Examples from other cases include the collaboration with legislators as a stakeholder, as in the case of the use of nanocosmetics, or a move towards open global platforms for discussion that allow for a more inclusive approach.

6.6 Limitations of the study

While the case of the European food industry presented in this chapter is illustrative, the particularities of these sector limit the applicability of the results to other industries. Moreover, the geographical limitation and the small number of interviews may limit the transferability of the conclusions. However, the study is prone to analytical generalisation (Polit & Beck, 2010), hence contributing to the development of research around the usefulness of voluntary standards and FoP labels for the implementation and reporting of RRI. However, it must be noted that our research, limited to a country and region, shows inconsistencies in the literature that call for further research in the drivers and barriers of voluntary standards for RRI with larger samples. At this stage, we contribute with the identification of some variables explaining the mechanisms of implementation.

6.7 Future directions

Our case examines voluntary standards and FoP labels as a mechanism of assessment and reporting of RRI, with mixed results. While they show a great potential to measure and set targets for integration of social values in the innovation practices and reduce the burden of individual mutually responsive inclusion practices, their trustworthiness and transparency as an RRI reporting method are still questioned by the participating companies.

If this is the case, how can the drawbacks be overcome by governing voluntary standards differently, without losing the main benefits, as mentioned above? Standard development remains largely a task dependent on private actors, who decide for themselves or decide which stakeholders to involve in the MSAs (Fransen & Kolk, 2007; Moog et al., 2015). To that extent, it remains a power-imbalanced and not transparent process. In the light of this, in some sectors governmental agencies have taken the lead in the development of standards, in an approach that combines hard law (regulation) with soft law (voluntary standards) developed with industry, such as the case of nanotechnologies and nanoparticles in cosmetics. The European approach to nanoparticles in cosmetics combines supranational regulation, covering aspects related to the precautionary principle (e.g. REACH Regulation or the Cosmetics Regulation EC 1223/2009) with science-based standards supported by governmental organisations (Ponce del Castillo, 2010). While ISO, European Committee for Standardisation (CEN) or the Organisation for Economic Co-operation and Development (OECD) have focused on technical, nomenclature and safety-related standards, the European Union adopted a Code of Conduct for Responsible Nanosciences and Nanotechnologies Research, which complements regulation. The Code of Conduct deals with those aspects on which legislation would obstruct innovation because of scientific lack of consensus, allowing for further flexibility and timely revision of the Code of Conduct (Ponce del Castillo, 2010). This approach to standard development is effective and transparent; however, it does not fulfil principles of mutual responsiveness or inclusivity as proposed by the RRI framework. This illustrates the trade-off between opting for straightforward top-down designed regulations and codes of conduct or for voluntary standards developed in close collaboration with stakeholders, which provide legitimacy to private-sector decisions. The latter may be more appealing in terms of RRI reporting for user or consumer trust concerns.

In an interesting development in the field of ICT a global working group (named OCEANIS) aiming to discuss the very use of standards for the integration of ethical issues is emerging. OCEANIS was founded in 2018 by several national bodies for standardisation and stands for Open Community for Ethics in Autonomous and Intelligent Systems (OCEANIS, 2018). The aim is to integrate the view of the standardisation bodies (usually backed by governments) with that of businesses, scientists (including

social scientists) and other organisations through an open and ongoing discussion about ethical concerns in the development of autonomous and intelligent systems. To that extent, it constitutes a governance innovation in the field of voluntary standards, whereby RRI principles of transparency, democracy and mutual responsiveness are incorporated before the innovation process commences. In this way, it addresses the issue of standardisation in a context of a globalised economy with different local ethical sensitivities.

While the involvement of governmental bodies for legitimatisation is not a necessary step for RRI assessment, it might provide a bonus of trustworthiness when reporting the RRI efforts to users and customers. However, a more nuanced approach where the discussion of criteria for voluntary standard setting is facilitated (instead of orchestrated) by governmental agencies in structures such as OCEANIS might show the future direction of voluntary standards for RRI. With direct involvement in the innovation process reported as too costly (Blok & Lemmens, 2015), and with private-sector-backed standards and labels suffering from a crisis of transparency and trustworthiness, new solutions are required. These solutions should allow for wider international participation, aiming to avoid power imbalances between the governing actor and the rest of the stakeholders, and in a spirit of open discussion where competitive information need not be shared yet.

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