UNIVERSITY OF LJUBLJANA
SCHOOL OF ECONOMICS AND BUSINESS

MASTER'S THESIS

THE SLOVENIAN STANDARDIZATION SYSTEM, ITS EFFECTS, STAKEHOLDERS AND CHALLENGES

Ljubljana, April 2021 KATJA MENCIGAR

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LIST OF ABBREVIATIONS

AFNOR – French Institute for Standardization
CEBR - Centre for Economics and Business Research, United Kingdom
CEN - European Committee for Standardization
CENELEC – European Committee for Electrotechnical Standardization
DIN - German Institute for Standardization

DTI – Department of Trade and Industry, United Kingdom
EFTA – European Free Trade Association
EN – European standard
ETSI – European Telecommunications Standards Institute
hEN – Harmonised European standard
ICT – Information and communication technologies
IEC – International Electrotechnical Commission
IEEE – Institute of Electrical and Electronics Engineers
IETF: Internet Engineering Task Force
ISO – International Organisation for Standardization
ISUG – Impacts of Standards Users Group
IPR – Intellectual property right
ITU – International Telecommunication Union
SDO – Standards-development organisation
SIST – Slovenian Institute for Standardization
SME – Small and medium-sized enterprises
TC – Technical committee
TR – Technical report
TS – Technical specification
VDI – The Association of German Engineers

INTRODUCTION

In the past thirty years, standards have become an essential part of the global market's infrastructure and with that our everyday lives. Standards dictate the designs of products and service form that most mundane to that most important. Standards regulate what dimensions our notebooks are; they enable that we do not have to bother whether or not a mobile application can be opened on our mobile phone model; they are the reason we feel safe when flying as we know that standards are there to protect us.

Many separate research studies have demonstrated how the use of standards and standardization benefits companies as well as the economies. On the macroeconomic level, the study performed by DIN, German national institute for standardization, suggests that standardization is responsible for approximately 0.7 to 0.8 percent of the yearly GDP growth and has attributed around 16.7 billion EUR per year between the years 2002 and 2006. Studies performed by other national institutes, United Kingdom, France, Canada, and Australia, show similar results (Blind, Jungmittag, & Mangelsdorf, 2011).

If we transpose this onto the companies' level, we see how standardization positively affects the overall performance of a company. Standards can be categorized in distinct groups based on what they codify and as such affect a variety of business' aspects. The studies (Beuth Verlag, 2000; Cebr, 2015; ISO, 2014; ISUG, 2002) conducted so far have mainly relied on data collected through various questionnaires and as such present soft data on how the companies' representatives gauged the impact of standards on various aspects of their company's performance. Thus, the studies revealed that the use of standards can foster trade by ensuring inter-operability; it can also affect the company's productivity by lowering costs of production and creating economies of scale; standardization can also have positive effects on innovation and the company's competitiveness. In addition, standards are used by the European Union as a policy instrument which ensures quality, safety and health protection and supports environmental protection efforts and social protection efforts (Ernst & Young, 2015).

With all of the positive benefits that standardization is proven to have on the economy, it is surprising how little focus is paid to standardization efforts in the Slovenian standardization ecosystem, which comprises of companies, which are the main users of standards, as well as institutes, government, and the academic sphere. Hardly any academic literature on standards and standardization can be found in the Slovenian libraries. It is precisely because of that reason that I have decided to dedicate my time to this topic.[1]

The focus of this masters' thesis will thus be the Slovenian standardization landscape and the effects the use of standards has on the Slovenian companies. With this study I will analyze the use of common European standardization processes and compare the results of the study to the studies performed by other European countries and international standards

[1] The gap has first been identified by the president of SIST, mag. Marjetka Strle Vidali, who commissioned the research in August 2019. The author of this masters' thesis was at that time employed at Giacomelli media, Management and Consulting, Ltd., the company chosen to carry out the research. The author was responsible for identifying specific research questions, carrying out all preliminary interviews, creating the survey, identifying the sample and obtaining the answers to the survey. The author was also responsible for the final analysis of the results of the survey and the preliminary preparation of the final report. This masters' thesis makes use of the same survey results although not all emphasis or purposes of the research are the same.

development organizations, namely the studies conducted by BSI Group (Cebr, 2015), DIN (Blind, Jungmittag, & Mangelsdorf, 2011), and ISO (ISO, 2014).

The main purpose of this masters' thesis is to analyze the Slovenian standardization system and consequently determine the role and impact that standardization has or could have in the Slovenian economy. The focus of this thesis is thus the role of *de jure* standards i.e. the standards that have been formed and approved formally by one of the designated standards-development organizations (SDO). The aim of this study is to provide a thorough understanding of the standardization process and how stakeholders in Slovenia can contribute and benefit from their use of standards as well as from their active participation in the national and international formal standardization processes.

In this study I will thus focus on achieving two specific objectives:
1) Identify Slovenian stakeholders and analyze their role and engagement level
2) Gauge the impact of standards on the performance of Slovenian companies.

Three specific research questions will guide the empirical part of this thesis:
1) What kind of impact do standards have on the performance of Slovenian companies?
2) What are the main motives which influence the purchase and use of standards?
3) How engaged are Slovenian companies in the process of standardization?

In the first part of the masters' thesis (chapter three) I will examine the current literature on the topic of standardization. The chapter will firstly define the terms *standard* and *standardization*. I will provide different classifications that can be used to determine the type of standards, I will identify the organizations responsible for formal standardization, identify all other stakeholders in the process and determine their role.

I then report the findings of other similar studies and thus establish the basis for the empirical part of this study. In the chapter I will analyze the macro and microeconomic effects of standardization, with a special focus on the impact of standardization on productivity and performance, trade, and innovation. In addition, the chapter will briefly identify other, non-monetary effects of standardization as well as determine the effects of active stakeholder participation in the formal process of standardization. I conclude this chapter by identifying relevant challenges in the Slovenian standardization process.

In part II (chapter four) of the thesis I will present empirical findings of the research that will focus on the Slovenian standardization landscape. The analysis of the results will be presented in two parts – the first part will identify the impacts that the use of standards has on the Slovenian companies, while the second part will present the level of stakeholders' engagement in Slovenia.

I conclude this thesis with a summary and discussion of key findings. The chapter will outline possible future objectives for the Slovenian standardization system.

1 LITERATURE REVIEW

Standardization itself is not a concept of modern world. First traces of formal standardization processes can be dated back to ancient times when rulers in Ancient civilizations started to enforce various weights and measurement standards to facilitate "commercial efficiency and

control" (Russell, 2007). Since then, formal standardization processes have slowly evolved into a ubiquitous part of the modern society. With the rise of globalization and capitalism, standards have become more and more important, which lead to the establishment of formal standardization development organizations with the purpose of ensuring safety and easier trade. The first national SDOs began to emerge at the end of 19th Century – BSI in 1901, DIN in 1917, AFNOR in 1926. International development organizations emerged soon after – ISO in 1947, CEN in 1961, IEEE in 1963.

The topic, however, has only recently gained more attention in the academic research as well as in governmental and other international public offices. In the last two decades, several important studies have been conducted that analyzed the effects of standardization (see Table 1). The field, however, remains one of the more poorly researched areas of the economics. In addition, most of the reports on the effects have been initiated by the SDOs themselves. In 2000, DIN published its first study that analyzed the benefits of standardization (Topfer, 2000). The results of the study were a stepping-stone for other SDOs' studies into the topic. The paper was based on econometric methods and analyzed the macroeconomic effects of standardization in Germany between 1960 and 1990 and was later updated by Blind, Jungmittag and Mangelsdorf with the results of the research study that followed the same methodology to include the years between 1992 and 2006. (Blind, Jungmittag, & Mangelsdorf, 2011).

The same econometric methodology with the focus on growth was used in 2005 by the Department of Trade and Industry, UK (DTI). Other important studies that have adopted the same methodology include the study conducted in 2006 by the Australian national SDO (Standards Australia); in 2007 by the Canadian national SDO (Standards Council of Canada); and in 2009 by the French SDO (AFNOR) (Blind, 2013; Swann, 2010). Both DTI and AFNOR's studies included interviews or surveys and thus provided a qualitative method to complement the econometric approach (Swann, 2010). The DTI study was later updated by the study commissioned by BSI and conducted by Cebr in 2015. It built upon the previous by updating the results in terms of macroeconomic benefits of standardization but has examined microeconomic effects as well (Cebr, 2015). This thesis grounds its research methodology on the study published by Cebr in 2015. In 2014, a similar study which made use of both qualitative and quantitative methods, was published by ISO (ISO, 2014). The study examined the impact of ISO standards across countries and industries by testing the results of ISO standards' implementation in around 30 company case studies in over 20 countries.

Table 1: Best known studies on the topic of the benefits of standardization

COUNTRY	***PUBLISHER***	***YEAR OF PUBLISH***
Germany	DIN	2000
United Kingdom	DTI	2005
Australia	Standards Australia	2006
Canada	Standards Council of Canada	2007
France	AFNOR	2009
Germany	DIN	2011
International setting	ISO	2014
United Kingdom	Cebr	2015

Source: Blind (2013); Cebr (2015); Swann (2010); ISO (2014).

Above mentioned studies provided ample evidence of the fact that standardization and standards bring certain benefits to the national as well as international economies and paved

the way to a more specific topics of standardization effects. As Swann notes in his update of the studies in 2010, the literature regarding standardization can be grouped into five sections: "[1.] macroeconomic or sectoral work on standards, growth and productivity; [2.] macroeconomic or sectoral work on standards and trade; [3.] work on standards and innovation; [4.] work that helps to open up the black box, and explain how standards have their beneficial economic effects; [5.] other work of significance that doesn't fit into categories [1. - 4.]" (Swann, 2010). The last category could be updated to represent work on stakeholder engagement of which a lot has been written in the last two decades.

One of the most prolific authors on the topic of standardization is Knut Blind, a German economist, whose work on standardization seems to provide framework for various other studies. His work was also the foundation of the desk research of this thesis. Another important author in the field of standardization is G. M. Peter Swann, an English economist whose work is regularly cited in other studies as well.

The number of published studies on the topic of standardization has increased in size in the last couple of decades. Consequently, standardization has gained a footing in the forming of national and international strategies as well. This thesis thus examines reports and other papers presented by the European Commission as well.

The basic structure of a standardization system is outlined in this first part of the thesis. Firstly, this chapter defines the term standard and standardization, examines different ways in which standards can be divided into groups, briefly describes the process of developing a new standard, and examines the role of specific stakeholders in standardization. This chapter then provide a literature overview of analyzed effects of the use of standards and standardization in terms of macroeconomic and microeconomic effects as well as non-monetary effects. Lastly, this chapter examines challenges faced by different stakeholders in standardization relevant to the Slovenian economic situation.

1.1 Standards and Standardization

In the most general sense, a standard is an agreed way of doing something. If we try to define a standard more precisely, we soon realize that the term standard stands for a variety of different concepts and uses. In the thesis I examine the so called *de jure* standards – standards that are formally developed by SDOs or governments - and *sponsored de facto* standards – standards that are similarly formally developed by industry consortia or companies. What *de jure* and *sponsored de facto* standards have in common is that they are formed formally through engagement of various stakeholders as opposed to *unsponsored de facto* standards which "might emerge naturally from interactions" (Featherston, Ho, Brevignon-Dodin, & O'Sullivan, 2016). The former thus "have greater legitimacy, especially in Europe, and are often of a higher quality" (Blind & Mangelsdorf, 2016).

A formally designed standard is, therefore, a document that directs the design of products and services and is formed by a recognized body. Standards are designed as a certain norm to follow in product manufacturing, process management, service delivery or material supply. Their main purpose is to enable the companies to achieve a higher level of performance. With the use of standards, the companies produce their products or services more efficiently, they can attain better quality, and enable compatibility in the value chain. However, standards are not only formed to serve the companies' needs – they are formed for the needs of the customer as well. Standards define rules that protect the customers by setting

norms that companies can or must follow – depending on the nature of the standard – in terms of health protection, safety, and environmental protection. One of the most important features of standards is thus that standards are designed with the consent of all stakeholders within the industry (Featherston, Ho, Brevignon-Dodin, & O'Sullivan, 2016). Thus, the act of standardization serves both the industry as well as the costumer with the more comprehensive objective of standards and standardization being "the dissemination of scientific and technical outcomes and extension of community benefits through mutual understanding within society and assurance of public order" (APEC Sub Committee on Standards and Conformance, 2010).

Featherson, Ho, Brevignon-Dodin and O'Sullivane (2016) conclude that although there exists a variety of definitions used to describe the term *standard*, there are certain elements that are included in the majority of them: "established by consensus; approved by a recognized body; provide 'rules, guide-lines, or characteristics for activities or their results'; 'aimed at the achievement of order'; and coherence in technical or commercial activities, particularly to ensure that users have confidence that codified knowledge, materials, products, processes, and services, among others, are 'fit for purpose'" (Featherston, Ho, Brevignon-Dodin, & O'Sullivan, 2016).

While a standard is a document, standardization is the process of designing and applying standards (Featherston, Ho, Brevignon-Dodin, & O'Sullivan, 2016). Standardization is defined by ISO as the "activity of establishing, with regard to actual or potential problems, provisions for common and repeated use, aimed at the achievement of the optimum degree of order in a given context" (Dupendant, 2016). A standard is thus the result of standardization but the key difference between a standard and standardization is "that standardization often occurs, at least to a certain extent, and is sometimes inevitable, whether a standard is acknowledged or formally established or not" (Featherston, Ho, Brevignon-Dodin, & O'Sullivan, 2016). Judging from that fact, it is, therefore, important that formal standardization is encouraged since its nature relies on cooperation between stakeholders which results in a fairer business and living environment for all. As Blind emphasizes, "The key point is that standardization is a voluntary process for the development of technical, but more and more also other types of specifications based on consensus amongst the interested parties themselves: industry in first place, but also a variety of users, interest groups and public authorities." (Blind, 2013). Similarly, a report published by the European Commission states that "[s]tandards are not regulations, but voluntary tools used primarily by industry as a means of defining a repeatable way for doing something" (Ernst & Young, 2015). Because their core purpose is to serve the public in general, standards are "made available to the public free of charge or for a mostly cost covering fee" (Blind, 2013).

Although the usage of standards is voluntary, some standards are in fact obligatory in some contexts, depending on the region. In the European Union specific standards have become a part of the regulatory framework (Blind, 2013). These standards are labelled as harmonized European Standards (hEN) and are decreed by Regulation (EU) 1025/2012 on European standardization, which entered into force in 2013 with the objective "to provide a framework for using the ESS[2] as a support to legislation and policies for product and services " (Ernst & Young, 2015). The individual hENs are normally proposed by the European Commission and/or EFTA.

[2] European standardization system.

In the United States, standards remain voluntary, not linked to any governmental regulation, while Japan and China do have some sort of regulation regarding standards which are linked to the ministries (Blind, 2013).

1.1.1 Classification of Standards

With industrialization, modern standardization efforts began to take form, while globalization stressed the importance of international standards (Dupendant, 2016). The evolution of formal standardization process developed in three distinct phases. At the turn of the 20th Century, the first standards were formed with the objective of enabling inter-operability of components. In this first phase of standardization, companies began to realize that an agreement on certain technical specifications of the products could ensure that companies gain more opportunities of entering new markets since their products were now compatible with their buyers' (Cebr, 2015). The first standards' main objective was thus to "simplify, unify, and specify" and was thus largely confined mainly to the industrial sector (Dupendant, 2016).

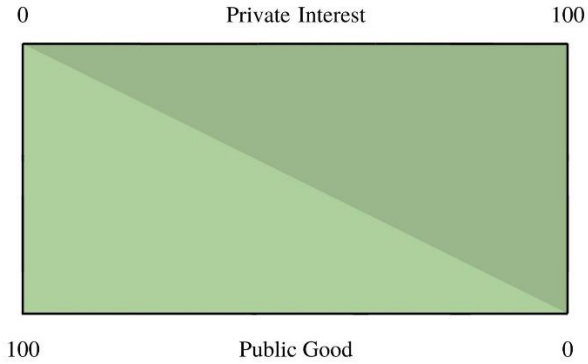
The second phase arose following the WWII, when industry experts began to recognize the role of the manufacturing process. They observed that the process itself bears great importance in assuring the quality of the product and that many processes, or procedures were similar in various other business and manufacturing settings. One of the most universal standards today is a process defining standard – ISO 9001 – which defines management systems to ensure quality.

In the last decade, the third phase can be discerned, a phase that is characterized by the achievement of high performance. The development of new standards is concerned with the improvement of "organizational performance by codifying best practice principles in the areas of behavior: leadership, governance, and risk (Cebr, 2015). The scope of standardization has, therefore, expended to comprise subjects not only relevant for the industrial sector but also sectors like "management, services, health, environment, and more" (Dupendant, 2016).

The evolution of standardization thus produced a variety of different kind of standards which is why it is difficult to produce or rely on only one classification system of standards. One of the aforementioned differentiation between standards is their *de jure* and *de facto* nature, which divides standards based on their development process (Featherston, Ho, Brevignon-Dodin, & O'Sullivan, 2016). Standards can also be categorized as proprietary versus open. The former defines standards which are owned by a company but can be licensed to others while the latter defines a standard that is open to all, usually without a fee (Ernst, Lee, & Kwak, 2014). Another way of making a distinction between different kinds of standards is by categorizing them according to the organization that issued the standard or according to their geographical reach, or, more precisely, according to their inclusivity or depth of consensus (Ernst & Young, 2015) . Thus, we can categorize standards as national standards, as is the case when a standard is developed by a national body (SIST, AFNOR, DIN). We categorize standards that were formed by CEN (European Committee for Standardization), CENELEC (European Committee for Electrotechnical Standardization), ETSI (European Telecommunications Standards Institute) as European standards, and standards formed by international standardization bodies ISO (International Organization for Standardization), IEC (International Electrotechnical Commision) and ITU (International Telecommunication Union) as international standards (Featherston, Ho, Brevignon-Dodin, & O'Sullivan, 2016).

In addition to public national, European and international bodies, transnational private non-profit organizations or associations, such as IEEE (Institute of Electrical and Electronics Engineers), IETF (Internet Engineering Task Force), VDI (Verein Deutscher Ingenieure), are also very important in the field of standardization. The standards developed by these private non-profit SDOs are usually developed for the use of one specific industry and are mainly of a more technical nature (Baron, Contreras, Husovec, & Larouche, 2019). One important distinction between the standards developed by the consortia as opposed to SDOs that act as a national or international standardization body, is their "relative balance in motivation between contribution to the public good and to private interest" (Totus, 2002). Figure 1 depicts this balance in which consortia tend to act more towards the right of the diagram whereas SDOs fall more into the left side of the motivational diagram (Totus, 2002).

Figure 1: Motivation of SDOs for standardization



Source: Totus (2002).

The complexity of the field can be observed in yet another possible classification method. Standards can also be classified according to the subject or the type of knowledge they codify. Various researchers have tried to categorize standards as succinctly as possible, thus, a number of different categorizations can be traced in academic papers. Featherston, Brevignon-Dodin and O'Sullivan, for example, distinguish between five categories of standards: "(1) Terminology and semantic reference standards, […]; (2) Measurement and characterization standards, […]; (3) Quality and reliability standards, […]; (4) Compatibility and interface (interoperability) standards, […]; (5) Configuration standards" (Featherston, Ho, Brevignon-Dodin, & O'Sullivan, 2016).

The research paper published by Cebr, on the other hand, provides a seven-category distinction of standards. Although some categories are similar, the paper establishes several very distinct categories by standard type: "(1) Quality management, […]; (2) Health and safety, […]; (3) Technical, […]; (4) Environmental, […]; (5) Code of practice, […]; (6) Management, […]; (7) Organizational governance" (Cebr, 2015).

Blind, Jungmittag, and Mangelsdorf, however, present a common classification which categorizes standards into four categories: "(1) Variety reduction; (2) Quality and performance; (3) Measurement standards; (4) Compatibility and interoperability" (Blind, Jungmittag, & Mangelsdorf, 2011). The authors then expand the categories to include four new groups of standards, without which the list is incomplete: "(5) Health and Safety; (6)

Environmental; (7) Codified knowledge; (8) Vision"[3] (Blind, Jungmittag, & Mangelsdorf, 2011).

1.1.2 Standard Development Process

The process of drafting a new standard is usually designed in a way that promotes the inclusion of various stakeholders – industry and business representatives, research institutes, governments, consumer associations, certification bodies – although their inclusion in practice is still a concern for the majority of SDOs (Ernst & Young, 2015).

The process is similar in the majority of SDOs, with slight differences between the drafting process in a national SDO and multinational or international SDO. The Slovenian institute for standardization (SIST), therefore, follows similar steps which are formed based on the Slovenian Standardization Act (Zakon o standardizaciji (ZSta-1)) and the SIST's Management board's resolutions of 5. Nov 2002 and 26. Oct 2005. The process or standardization project begins with a proposal which can be submitted by anyone, including by any natural person with residency in Slovenia. The proposal must be submitted in the written form, accompanied by a written argumentation for the adoption of the new standards.

All submitted proposals are reviewed by the competent technical committee – comprised of different stakeholders that are experts on the subject – or are sent straight to a specialist council if the former does not exist. The specialist council then votes on the relevance of the proposal. For the proposal to be approved, at least 75% of members of the council must support the bid. Once the proposal is accepted, it is included in the working program of the institute.

A technical committee develops a working draft of the standard. When the need arises, new technical committees are established in order to support the needs of the emerging markets. A technical committee can form a separate working group to allow for better representation of stakeholders and expertise. A consensus must be reached or at least 75% of the members must approve the draft for the proposal to become a working draft of a standard.

The working draft of the standard is then issued for public consultation in the institute's bulletin. The public has 30 days to provide comments on the draft. These comments must all be reviewed and taken into consideration by the technical committee in order to prepare an updated version of the draft. The committee accepts the comments that have again reached consensus or gained at least 75% of votes. The final draft of the standard is normally approved by the specialist council and finally formally published (SIST, 2005).

The drafting process of a European standard – a standard that is published by one of the European SDOs CEN, CENELEC, ETSI – follows the same steps and principles, however, functions on a higher, multinational level. In a European setting, a proposal can be submitted by a national SDO, not by a natural person as is possible in the national standard setting. Stakeholders that are actively involved in the process are appointed by the national SDOs. The draft of a European standard must likewise be made available for comment to the public at a national level. After the European standardization organization ratifies a standard, the standard is adopted by each national SDO as a national standard. Any existing standard that

[3] Vision in this context refers to standards that are higely likely to influence the future of an industry and "serve as a sort of public vision statement" (Blind, Jungmittag, & Mangelsdorf, 2011).

conflicts with the new European standard is withdrawn simultaneously. Standards may then be translated into national languages (Ernst & Young, 2015).

The rigidity and inclusivity of this process ensures the high credibility of *de jure* standards. Standards developed by formal SDOs are expected to bring more security in their use since the companies can be sure to expect that these standards are cleared of any patent and copyright issue. Their technical completion rate as well as critical mass of users are additional features that establish credibility of these standards. However, although the process itself provides above-mentioned benefits, it takes a long time before the standard passes every stage and is formally issued. This can present an issue with standards that try to capture emerging technologies (APEC Sub Committee on Standards and Conformance, 2010).

In practice, studies have found that the process of developing a new standard is problematic since it is perceived as burdensome and bureaucratic. In the review of the European standardization system conducted by EY and commissioned by the European Commission, the authors state that the "average EN drafting time is estimated to 280 days, while enquiry and vote last on average 145 days and 61 days, respectively", which is a considerably long period in a fast changing market (Ernst & Young, 2015). Some steps have already been taken to address this issue.

1.1.3 Stakeholders in Standardization

Although the actual implementation of a standard happens on a company level, the industry is not the only stakeholder in the process of standardization. In the practical sense, standards are used by two opposite sides of a commercial relationship – the seller and the buyer. The seller benefits from the use of standards by creating a more efficient production or service while ensuring quality and safety at the same time. On the other hand, the customer – or the broader community – can depend on the fact that the product meets all the technical specifications that guarantee the safety of the product, its quality and other ethical considerations (Ernst & Young, 2015). This relationship thus becomes more complex and should be examined based on the nature of the standard itself. It is imperative, however, that various stakeholders are engaged in the process – ranging from industry and business representatives, research institutes, governments, consumer associations, certification bodies, to environment, SMEs, persons with disabilities, NGOs (Ernst & Young, 2015; European Commission, 2016). The characteristics of engagement of these specific stakeholders will be examined in this chapter.

1.1.3.1 Standards-development Organizations

SDOs are organizations responsible for realizing the process of standardization. Their main purpose is to gather proposals for new standards, to round up the important stakeholders, and establish a working environment for a standard to be developed. The most important stage of this process and the essential purpose of every SDO is the reaching of consensus. Proposals or drafts of a standard can only be accepted if the stakeholders of the SDO that is issuing the standard have managed to reach an agreement on all the specifications that the new standard constitutes. That is why we consider the role of different SDOs on the basis of their depth of consensus. Therefore, standards are only valid in certain political structures wherein that consensus has been reached (see Table 2).

Table 2: SDOs based on their depth of consensus and nature of adoption of their standards

THE DEPTH OF CONSENSUS	***SDOs***	***THE NATURE OF ADOPTION***
International	**ISO:** specify general areas **IEC**: specify electro-technical areas **ITU:** specify the area of ITC.	Adoption of a standard is voluntary.
European	**CEN**: specify general areas **CENELEC:** specify electro-technical areas **ETSI**: specify the area of ITC.	A European standard is approved automatically in all 34 countries that are members of CEN and CENELEC. Standards are voluntary, however, some European standards can become a part of the European legislation which in turn makes the standard obligatory for use in all countries of the EU. These standards are called harmonized standards (hEN).
National	**SIST:** Slovenian institute for standardization **DIN**: German institute for standardization **BSI**: British Institute for standardization	National standards carry a national consensus in the country of adoption. Standards developed by foreign national SDOs can become adopted in other countries as well, if that country reaches consensus for that particular standard.
Industry – limited to private organizations/industry consortia	**IEEE**: specify standards relating to technology **IETF**: specify internet standards **VDI**: The Association of German Engineers	Standards are voluntary. Some standards are submitted for consideration to other SDOs. Thus, standards developed by industry consortia regularly become internationally adopted.

Source: Ernst & Young (2015); Baron, Contreras, Husovec, & Larouche (2019).

Standardization happens globally on three levels. The first level of standardization system in any country is the national SDO which is responsible for drafting its own national standards. In addition, one of the national SDO's core responsibility is to participate in the larger, multinational or regional setting, and international setting. While the purpose of a national SDO is to engage various national stakeholders, they are themselves the main stakeholders in multinational or international organizations. The multinational SDOs represent the second level of standardization and carry greater weight since they comprise a larger body of consensus. The European standardization system thus develops standards which, when ratified, become valid standards in all member countries[4] and provide support for legislation at European level.[5]

European standardization system is closely connected not only to national SDOs in Europe but with international SDOs as well. A European SDO may adopt an international standard formed by an international SDO – ISO, and IEC, for example. International SDOs represent the third level of standardization and hold larger depth of consensus but, on the other hand,

[4] CEN and CENELEC has 33 members: 28 EU memeber states, North Macedonia, Turkey, Serbia, and EFTA members Iceland, Norway and Switzerland.

[5] Other regional groupings are : the ASEAN Consultative Committee for Standards and Quality (ACCSQ), the Arab Industrial Development and Mining Organisation (AIDMO), the African Regional Organisation for Standardization (ARSO), the Pan-American Standards Commission (COPANT), the Euro-Asian Council for Standardization, Metrology and Certification (EASC), the Pacific Area Standards Congress (PASC), and the South Asian Regional Standards Organization (SARSO) (Dupendant, 2016).

do not have the same authoritative power as other regional and national SDOs may have (see Table 2).

Complementary to the SDOs recognized by the governmental bodies, there are SDOs that have a more informal governance structure. These SDOs are privately held and usually connect stakeholders from only one industry. Standards developed by these SDOs are offered for voluntary use only. The SDO may provide certification for their own standards or submit the standard to a SDO with a larger body of consensus (Ernst & Young, 2015).

Every SDO, therefore, operates in a larger ecosystem. This ecosystem creates three kinds of constrains that affect SDOs' governance choices. These constraints may be of legal nature, may arise due to necessary relationships with other SDOs, or may result from the competition in the market. The most defining constraints are legal constraints on SDOs which result from international trade law, intellectual property law, competition or antitrust law, and public procurement law. Constraints that result from relationships between SDOs occur in both vertical and horizontal structures, and affect SDOs at the bottom of hierarchy – national SDOs – and SDOs at the top – international SDOs (Baron, Contreras, Husovec, & Larouche, 2019). Cooperation between SDOs is an important part of every SDO since one of the core purposes of standardization is to bridge gaps between countries. Cooperation promotes standardization, helps to prevent duplication of work and conflicting international standards, and helps the standards by making sure the expertise of other SDOs are properly leveraged (Dupendant, 2016). The third kind of constraints – constraints arising due to competition in the market – mostly affect SDOs that are formed by private, industry-specific consortia (Baron, Contreras, Husovec, & Larouche, 2019).

Because of their different natures and different constraints on them, SDOs' structures vary quite a bit. While some SDOs, namely the more informal SDOs, operate in a leadership-driven model, the majority of formally established SDOs tend to emphasize membership and a consensus decision-making model. This distinction originates from the fact that formal SDOs carry greater weight in authority and thus have to "consider public interest concerns in their work", whereas informal, industry-driven SDOs normally highlight "technical aspects of their work" (Baron, Contreras, Husovec, & Larouche, 2019). Nonetheless, the majority of SDOs remain non-governmental, non-profit organizations. National SDOs' membership is normally made up of the biggest and most high-profile companies, while regional groupings and international SDOs' members are national SDOs themselves. For these purposes, some SDOs have signed specific agreements to honor the above-stated aims of cooperation. (Baron, Contreras, Husovec, & Larouche, 2019).

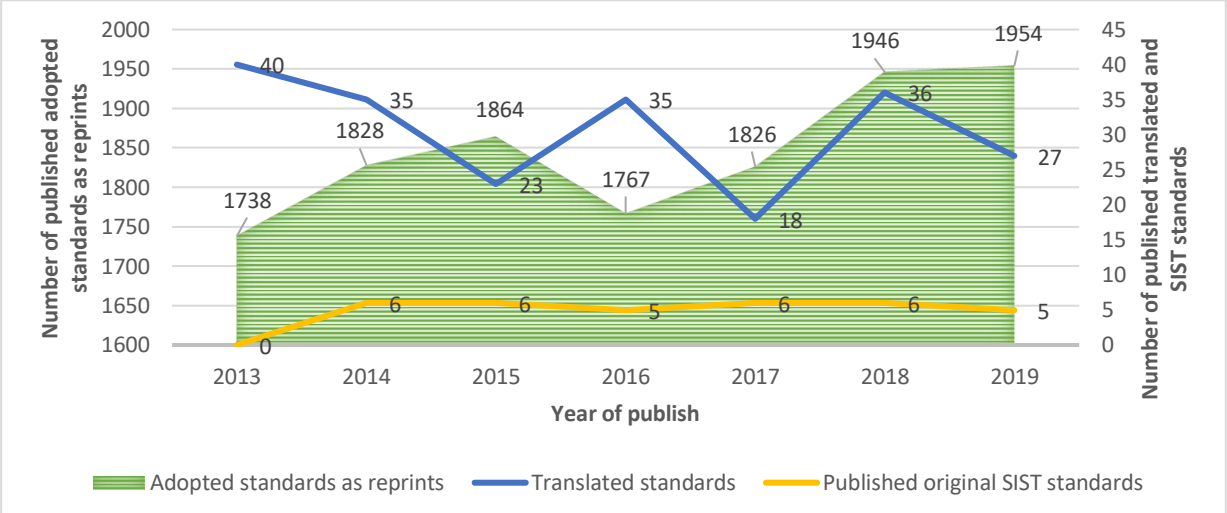
Slovenian Institute for Standardization (SIST) stands as the Slovenian national SDO. In 2000, the institute in its present form was formed as an independent institute from the institute that previously combined metrology and standardization. SIST was established on the basis of Official Gazette of the Republic of Slovenia, No. 70-3343/2000 and No. 91-4591/2002 (Uradni list RS, št. 70-3343/2000 in Uradni list RS, št. 91-4591/2002) and Standardization Act (Zakon o standadizaciji (ZSta – 1)). The institute, although established by the government, is an independent entity. This is deemed necessary by the institute which states that the institute performs "professional tasks in the field of standardization which are and must be independent from political influence" (Slovenian Institute for Standardization, 2020).

The institute's main role is to "prepare, adopt, issue, and maintain Slovenian national standards and other documents in the field of Slovenian national standardization" as well as to "represent the interests of Slovenian national standardization in international, European and other standardization organizations", as stated in the Official Gazette of the RS. As a member, SIST, therefore, represents Slovenia in ISO, IEC, CEN, CENELEC, ETSI, in the joint cooperation of ITU-T and ETSI, and in the joint technical committee ISO/IEC JTC 1 (Slovenian Institute for Standardization, 2020). The institute main structure is divided into different technical committees (TC) based on the nature of standardization activity they represent. The number of TC that comprise SIST's main working body has remained mostly the same with only slight increase – in 2010 SIST comprised 75 TCs, whereas in 2019 it held 79 TCs.

SIST acts as a non-profit organization. It, however, can perform commercial activities as well. The sale of copies of standards published by other national SDOs – mainly BSI and DIN –, European funds received for the purpose of translation, and seminars fall into the latter category. The institute is thus mostly financed by the State budget. In 2019, SIST received 1,129,918.41 EUR from the state (1,077,973.85 EUR in 2018) and earned 539,656.84 EUR or 32 percent of the annual budget commercially (459,309.49 EUR in 2018). (Slovenian Institute for Standardization, 2019; Slovenian Institute for Standardization, 2020).

In the last couple of years, SIST maintained a 100 percent rate of adoption of harmonized EN (hEN), which means that all the standards issued as obligatory in the context of European Single market initiative have been included in SIST's net stock of standards and have received a Slovenian title. Figure 2 depicts the number of adopted standards by SIST in 2013 – 2019 based on their level of adoption – as a reprint or translated.

Figure 2: The number of published adopted standards (left axis), the number of translated standards and the number of original SIST standards (right axis) based on the year of publish



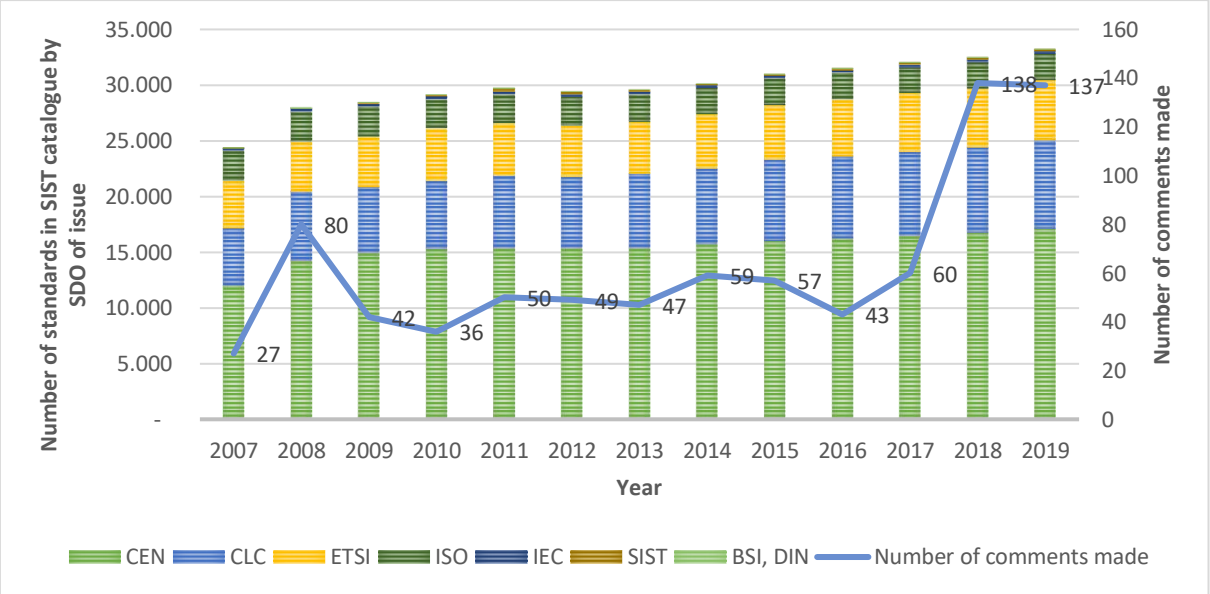
Source: Slovenian Institute for Standardization (2019); Slovenian Institute for Standardization (2020).

In 2019, SIST adopted 1954 standards as reprints which translates to a 12 percent increase from the year 2013. The number of adopted standards as a translation in years 2013 – 2019 represents still only a fraction of all adopted standards – on average, only 1.64 percent of adopted standards in 2013 to 2019 have fully been translated. Adopted standards are marked

with the abbreviation SIST before the international abbreviation and number, SIST ISO 9001, for example. SIST develops original Slovenian standards as well, although, their number is limited to only a few a year. Between 2013 and 2019, SIST published on average only *five* standards per year (see Figure 2). In addition to standards, SIST publishes three types of documents which have a similar role as standards, however, normally represent less defined specification or a weaker level of consensus. These standardization deliverables are technical report (TR), which consist of mainly data collection report, technical specification (TS), which represents only a consensus of a technical nature and is limited to the technical committee, and guides, which offer only information regarding standardization (Dupendant, 2016 and (Slovenian Institute for Standardization, 2020).

Between the years 2007 and 2019, SIST has steadily increased its standards' catalogue from 24,423 in 2007 to a 33,238 net stock of standards in 2019, or for an approximately 36 percent increase (see Figure 3). Net stock of standards represents the total number of standards in use in the given year, adjusted for new adoptions and new withdrawals (Slovenian Institute for Standardization, 2020).

Figure 3: The number of standards in SIST catalogue by SDO of issue (left axis) and the number of comments made by year (right axis)



Source: Slovenian Institute for Standardization (2019); Slovenian Institute for Standardization (2020).

The net stock of standards is steadily increasing which relates to the fact that standardization has become more and more recognized as a source of economic and social progress. The net stock of standards, according to Cebr report, represents a "reasonable proxy" for the level of standardization of a country and the overall demand for standards (Cebr, 2015). The annual growth rate observed from data from the SIST catalogue between 2007 and 2019 averaged 2.7 percent, which is comparable to data observed from BSI catalogue for the period 2001 to 2014 which averaged 3 percent annually (Slovenian Institute for Standardization, 2020; Cebr, 2015). The UK data showed that the annual growth rate has slowed compared to the growth rate observed in the previous periods – the highest growth rate was observed in the sixties when it averaged 6.6 percent annually (Cebr, 2015).

More than half of standards held in SIST catalogue have been issued by CEN. Between the years 2007 and 2019, CEN issued standards represented on average 52 percent of total number of standards. CEENELEC issued standards represented another 22 percent, while ETSI and ISO represented 16 and 8 percent, respectively. Standards issued by other SDOs – IEC, BSI, DIN, and SIST – on average represented only around three percent of total net stock of standards (Slovenian Institute for Standardization, 2020).

SIST acts as a gateway to national standardization and offers these standards mostly only for a cost covering fee. Before their official publish or during the process of development when SDOs are gathering comments on the new standard draft, these documents are, however, published online by SIST. The public thus can see all documents and its specifications completely free of charge since these standards are normally officially published with only minor changes. SIST's data show that SIST and its members are becoming more engaged as stakeholders in the process of regional and international standardization. Figure 3 shows how the number of comments submitted for consideration by Slovenian TCs has drastically increased in the last two years. In 2007, SIST's members submitted 27 comments to drafts, whereas in 2018 the number increased to 138 in 2018 and 137 in 2019 (Slovenian Institute for Standardization, 2020).

1.1.3.2 The Industry

The most straightforward effects of standardization can be seen on the level of individual companies. Industry thus plays a pivotal role in the standardization system – industry players are the initiators, the developers and the users of standards. However, while all companies indubitably fall into the latter category, the same cannot be said for the first two. Recent studies have shown that only a fraction of companies actively participate in the process itself. A study conducted by Cebr indicates that only 25 percent of large companies and only 10 percent of SME included in the survey claimed to be highly involved in the process. This indicates that stakeholder engagement is still rather low (Cebr, 2015). To boost participation, steps to thoroughly analyze the benefits of standardization have been taken by both individual SDOs as well as other stakeholder such as the European Commission. The results of these studies, which examine macro and microeconomic effects of standardization, are detailed in the next chapter.

Several papers have also tried to analyze the motives of individual companies which lead them to active participation in the development of standards. Knut classifies various motives into a range of four categories – "(1) decreasing market uncertainty; (2) knowledge acquisition; (3) access to markets; and (4) conformance with government policies" (Blind & Mangelsdorf, 2016). The study by Cebr analyzed motives with similar conclusions, but focused more on the level of influence the companies that are actively involved in the process gain from the process (Cebr, 2015).

Just as the structure of individual SDOs vary, so does the membership system. Companies usually represent core members in national SDOs and as such participate on the principle of direct membership. Based on the level of networking of the national SDOs, the company representatives can participate in regional and international SDOs as national delegates. These representatives are chosen based on their expertise and appointed by the respective TC. CEN and CENELEC are such SDOs where participation is based on the principle of national delegation, whereas ETSI works without intermediaries like national SDOs.

The industry players are, therefore, pivotal actors in the process since they provide the majority of the experts needed in the development of new standards. The process is thus heavily relied upon the active participation of various industry representatives, although their involvement remains completely voluntary. What is more, the standardization process itself is financed primarily by the companies themselves, through their voluntary supply of experts, through membership subscriptions, and, ultimately, through the purchase of published standards (Ernst & Young, 2015).

However, because the process is financed by companies and participation is voluntary, stakeholder engagement can be an issue. SMEs normally have very little participation rates, even though they account for "99.8 percent of all businesses, 67.5 percent of all jobs and 58.4 percent of value added" (Technopolis Group, 2012). The system is actively trying to overcome this issue but an improvement is yet to come. For the purpose of representing the interests of SMEs in the European standardization system, the European legislation on standardization has added specification which state that the underrepresented stakeholders will be supported by bodies called "Annex III organizations" (Ernst & Young, 2015). The body which is currently supporting the interests of SMEs on the European level is called NORMAPME. The body was established in the 1996 and is financed directly by the European Commission. Its main purpose is to promote understanding of craft and SMEs' needs in relation to European standardization, to enhance their direct participation in the standardization processes, and to enhance their access to information" (GHK & Tehnopolis, 2009).

The Slovenian economy faces the same issue; SMEs in Slovenia account for 98.9 percent of the market, with micro companies representing 94.1 percent and small companies representing 4.8 percent of all Slovenian companies. Another disadvantage in the global standardization system is also the position of Slovenian companies in the global value chain (Močnik, D., Duh, M., & Crnogaj, K., 2018). In this respect, Slovenian problems could be aligned to those of the developing world since the companies are usually perceived as suppliers in the global value chain. As such, these countries are merely passive adopters of standards, not standard setters, since their "innovation capabilities are prescribed by the governance structure of the GVC" (Zoo, de Vries, & Lee, 2017).

1.1.3.3 Public Authorities and Regulators

Public actors have a direct interest in standardization. Their main aim is directed at achieving "smart, sustainable and inclusive growth" (Ernst & Young, 2015). They can engage in the standardization process in a number of ways; their most important roles though are the roles of policy maker, coordinator and funder. The role of the government in standardization, however, is very much dependent on each individual country's preferences. It can, for example take an active role as an implementer of policies aimed at accelerating standardization processes, or it can remain an observer, letting the market to develop on its own (Vollebergh & van der Werf, 2014). Scholars, however, do not agree on the precise degree and direction a government should take in the case of standardization. The topic is currently still politically and ideologically infused. That is why a "[g]eneral agreement about appropriate public policy toward government standard setting does not exist. The most basic questions remain unaddressed" (Ernst, Lee, & Kwak, 2014).

Swann lists possible policy initiatives as "the engagement of stakeholders in standardization; reorganizing the standardization process; updating the stock of standards; education about

standards; the use of standards to resolve 'big issues'; integration of researchers and innovators into standardization; access to standards and pricing of standards; coordination of different government standardization activities; batter regulation through standards" (Swann, 2010).

The big issue especially is one of the conditions where strong strategic standardization policy can benefit the broader community. A big issue is a social, economic or environmental problem that is having or will soon have a large-scale impact on the lives of the community. The society is ill-prepared for this issue either because the issue has only recently been detected as a problem, either because the issue has been known for some time but the current system is ill-equipped to deal with the problem, or finally because we believe that current social, economic or technological priorities are actually making the problem worse. In cases where big issues are at stake, Swann argues for the governmental intervention in the form of policy but maintains that this intervention is beneficial only if the government recognizes the role and interests of other stakeholders (Swann, 2010).

One of the important roles that the government has is also in coordination and the diffusion of standards. Governments play an important role in diffusion by incorporating standards into their public procurement schemes. The government thus has the ability to push standards that would probably not be adopted otherwise because of their demanding specifications (Blind, 2013). One example where the market needs more such intervention is in the case of eco-innovation where standards would not be adopted without some sort of push (Vollebergh & van der Werf, 2014). Blind, however, finds that although governments indeed push certain standards through public tenders and similar instruments, they do not cooperate with other stakeholders. They thus do not participate in the standardization process but only make use of the existing standards (Blind, 2013).

The European Commission, which acts as an initiator of European legislation, has gradually included standards as the tool used to support the legislation of the EU namely to support legislation under the New Approach. The European Commission can request a development of a specific standards which will later be harmonized (Ernst & Young, 2015). It recognizes standardization system as a tool to "help Europe to safeguard its advantage as first mover and to keep pace with changes and opportunities created by market developments" as well as a tool to guarantee "high level of safety, health, consumer and environmental aspects to protect European citizens" (European Commission, 2019).

In 2015, the European commission launched a Joint Initiative on Standardization in which the signatories have agreed on a set of principles which guide the European standardization system. They have identified the following priorities for which the public actors should exercise their role more actively to support the European standardization process:
"1. Awareness, Education and Understanding about the European Standardization System i.e. increasing the relevant use of standards and participation in the process at all levels;
2. Coordination, Cooperation, Transparency and Inclusiveness, i.e. ensuring adequate, high-quality, user-friendly and timely European standards;
3. Competitiveness and International dimension, i.e. standards supporting European competitiveness in the global markets." (European Commission, 2016)

The Slovenian government participates in the European standardization system as one of the member states and follows the principles set by the European Commission. Standardization

has been recognized as one of the tools in achieving a "competitive and socially responsible business and research sector" (Šooš, 2017). Standardization has thus become one of the important strategic targets. The Slovenian Standardization Act (Zakon o standardizaciji (ZSta-1)) defines its aims as follows:

- "ensuring the quality of products, processes and services by defining their characteristics, which determine their ability to meet a specific purpose;
- raising the level of safety, protection of health and life and protection of the environment;
- ensuring the rational use of labor, materials and energy in the manufacture and exchange of products;
- improving production efficiency by managing diversity, compatibility and substitutability;
- promoting international trade by preventing or eliminating barriers to trade arising from unjustified differences in business practices at national level."

The Slovenian government act also as a funder of various standardization activities besides financing SIST. One the more important contributions is the subsidies available for SMEs.

1.1.3.4 Other Actors

Other more important actors with a direct interest in standardization are accreditation and certification bodies, research institutes, bodies representing interests of certain underrepresented stakeholders, laboratories, and other actors such as legal experts, academics, innovation agencies.

Certification bodies' main purpose is the assessment of conformity with a standard while the more indirect purpose in standardization is the diffusion of standards and knowledge (Zoo, de Vries, & Lee, 2017). They also support the development process by contributing their set of expertise, namely in the drafting stage by issuing comments to the draft (Ernst & Young, 2015). While any business can in fact certify itself, only accredited certification bodies have themselves gained third-party verification of quality from a National Accreditation Body. Accredited certification bodies thus imply validity and reliability of the certification (Technopolis Group, 2012).

Research institutes represent a very important stakeholder in standardization because of its direct ability to steer innovation process and policy (Featherston, Ho, Brevignon-Dodin, & O'Sullivan, 2016). Research institutes or similar organizations have the potential to identify emerging technologies, have the knowledge to actively contribute to its development and, as a public actor, should therefore have the incentive to transfer new technology so that it becomes commercially exploitable in the market. Research institutes as a stakeholder in standardization directly influence the time to market of a new technology and is thus one of the primary strategic partners in innovation process of a country (Blind, 2013).

Other bodies represent interests of the stakeholders that are not sufficiently represented without their intervention. Some of these bodies do not have a direct financial interest, some do; they, however, all support social interests of a country or union. While their main purpose is to represent interests of these groups of stakeholders, they also improve the creation of standards by contributing certain expertise. These bodies do a lot for raising the level of quality of standards as well as bring legitimacy to the whole standardization system (Ernst & Young, 2015).

In Slovenia, SIQ and Bureau Veritas represent the leading certification bodies. Their activity ranges from certification and educational activities to testing while their scope includes quality, environment, technology, health and safety, and social responsibility. An important actor that operates as an accreditation body is SZKO, Slovenian Association for Quality and Excellence. The most prominent research institute in Slovenia is IJS, Institute "Jožef Štefan". The institute has an active Physics; Chemistry and Biochemistry; Electronics and Information Technologies; and Reactor Engineering and Energetics Department.

In the European standardization system, the following bodies represent otherwise non sufficiently represented voices: NORMAPME, European Office of Crafts, Trades and Small and Medium-Sized Enterprises for Standardization, stands as an official body representing SMEs' interests in European standardization system; UEAPME, European Association of Craft, Small and Medium-sized Enterprises, similarly represents SME's interests; ANEC, European Consumer Voice in Standardization, represents the interests of costumers; ETUI-REHS, European Trade Union Institute for Research, Training and Health and Safety, represents interests of trade unions; and ECOS, European Environmental Citizens' Organization for Standardization, standing for the interests of the environment (GHK & Tehnopolis, 2009).

1.2 The Effects of Standardization

Recent studies have shown how standards contribute to the company's success in a number of ways which in turn contributes to the growth of the economy of the country. This chapter first examines the macroeconomic effects of the use of standards and later analyzes the microeconomic effects that contribute to this growth in more detail. In addition, standards have proven to be a catalyst for positive changes in terms of not only effects that can be measured in monetary terms but non-monetary terms such as environmental health and safety as well. These non-monetary effects will be examined in the last part of this chapter.

1.2.1 Macroeconomic Effects

Several studies have examined the impact of standards on overall economic growth. The results of these studies all confirm a clear connection between the level of standardization in an economy and productivity, trade, and innovation activity. Table 3 presents the results of these studies, carried out by various countries – German, United Kingdom, Australia, Canada, and France.

These studies employed a number of different but similar econometric methodologies. The DIN study constructed a model with GDP output as the estimated function. The model takes into consideration the economies of today which are more heavily knowledge-based and thus includes technological progress as the predicting variable, adjusted for the external political factors. The model was constructed as a function of the gross fixed assets (capital), the number of persons employed (labor), the number of patents, the number of license expenditures, the number of standards and dummy variables representing external factors (Blind, Jungmittag, & Mangelsdorf, 2011). On the other hand, the Cebr study of 2015 measured the impact of standards by estimating the effect of standards on labor productivity. The model included capital-employment ratio, net stock of standards, time trend and recession indicator as variables (Cebr, 2015).

Although the methodology of these studies differed, the results showed that standards and the growth of standards catalogue "may account for between one-eighth and one-fourth of productivity growth over the period (or annual GDP growth of 0.3 percent – 1 percent)" (Ernst & Young, 2015). In Germany, this translates to an economic benefit of approximately €16.77 billion per year or 0.72 percent of the country's overall GDP (Blind, Jungmittag, & Mangelsdorf, 2011). Table 3 shows that similar conclusions can be drawn for the impacts of standards on the economic growth rate of other countries. On average, standardization contributes 0.64 percentage points to growth per year, or between 9.2 (Canada) to 28.4 (UK) percent of GDP growth (Blind, 2013; Blind, Jungmittag, & Mangelsdorf, 2011; Cebr, 2015; Swann, 2010).

Table 3: The studies on the topic of the benefits of standardization

COUNTRY	***PUBLISHER***	***YEAR OF PUBLISH***	***PERIOD OF ANALYSIS***	***ESTIMATED FUNCTION***	***CONTRIBUTION OF STANDARDS TO GDP GROWTH, % POINTS***
Germany	DIN	2000	1961 - 1990	GDP output	0.9
United Kingdom	DTI	2005	1948 - 2002	Labor productivity	0.3
Australia	Standards Australia	2006	1962 - 2003	Total factor productivity	0.8
Canada	Standards Council of Canada	2007	1981 - 2004	Labor productivity	0.3
France	AFNOR	2009	1950 - 2007	GDP output	0.8
Germany	DIN	2011	2002 - 2006	GDP output	0.7
United Kingdom	BSI/Cebr	2015	1921 - 2013	Labor productivity	0.7

Source: Blind (2013); Blind, Jungmittag, & Mangelsdorf (2011); Cebr (2015); Swann (2010).

The results of these studies highlighted the relevance of standards and formed a deeper understanding of the economic progress. One of the most important findings of these studies was that "[t]he macroeconomic benefits of standardization exceed the benefits to companies alone", and that "[s]tandards contribute at least as much as patents to economic growth" (Swann, 2010).

Some issues regarding the results of these studies have, however, been identified. Cebr identifies these issues as three separate topics that must be considered when interpreting the findings of econometric studies. The first issue identified relates to the assumption that the number of standards relate directly to the economic growth. This would mean that every standard issued contributes a proportionally equal benefit to the economy and that the bigger the stock of standards the better. This would also suggest that the benefit of standards to the growth rate remains the same each year. These assumptions do not hold in practice, where some standards are more relevant than other standards and thus contribute more benefits to the economy. The second issue identified raises the question of a black box approach to model structure. These econometric approaches treat standards and their contribution only in terms of inputs and output but fail to address the inner mechanisms – how standards are truly used at the company level (Cebr, 2015). This issue persists especially because of the data collection problem. Swann concludes that because of this approach "the effect of a standard in a 'black box' econometric model can only be estimated with an element of uncertainty, depending on the routes and mechanisms involved" (Swann, 2010). The third

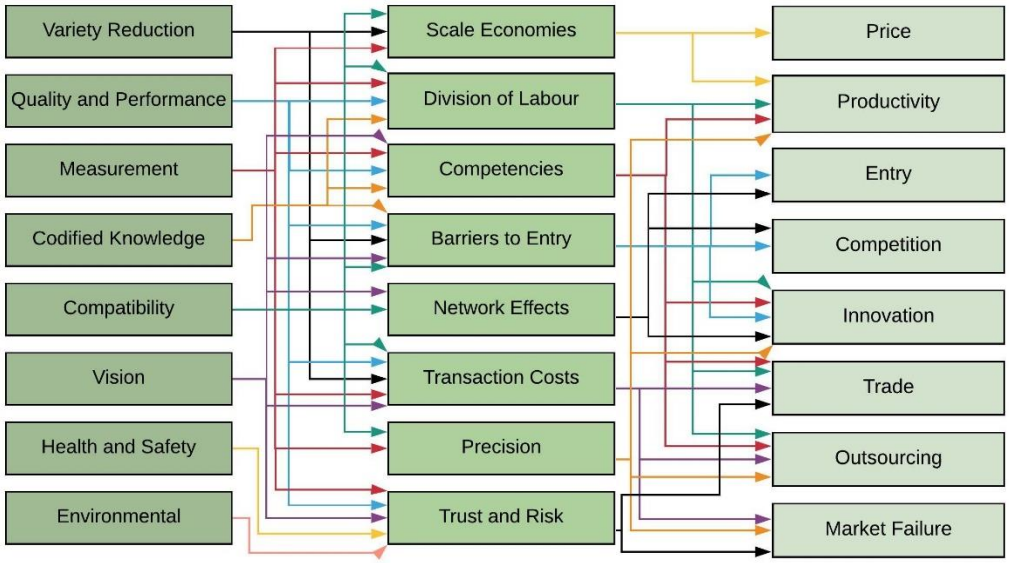
issue identified, relates to econometric models constructed to estimate the function of labor productivity. This approach fails to incorporate other components of total factor productivity, such as the level of scientific knowledge and the rising level of education. The models are thus overestimates of the actual level of impact (Cebr, 2015).

1.2.2 Microeconomic Effects

On the microeconomic level, the effects of the standards become more difficult to analyze as well as separate into distinct categories. The use of standards influences foremost the industry on an individual level which, therefore, makes the measurement of these effects a difficult task – either because these aspects of the business remain classified information or simply due to difficulties encountered in the collection of data. In addition, some standards have an impact on the broader community, where these influences are even harder to analyze properly as the effects are more indirectly connected to the use of standards. One of the main flaws of the econometric models is thus the uncertainty which originates from this black box of companies' individual proceedings. Current models rely mostly on the number of net stock of standards as the main predictor variable, forecasting the economy's growth, innovation and other economic effects. This approach disregards the distinction between various types of standards, or their main purpose, which leads to the results where one cannot predict the influence of standards on an individual, specific economic condition (Swann, 2010). Studies, like the one conducted by Cebr and ISO, have tackled this issue by combining the quantitative methods with a more in-depth qualitative research. In addition, ISO has developed the "ISO Methodology", designed to be used to determine microeconomic benefits of the use of all types of standards – standards developed by all types of SDOs (ISO, 2014). A number of studies have already been carried out and their results reveal that, although there are differences between sectors, "implementing standards can provide economic benefits from between 0.5 % and 4 % of their annual sales revenues" (Blind, 2013).

The benefits of the use of standards are usually stated as affecting three general areas – productivity, trade, and innovation. However, that is an oversimplification of the complex machine that is set into motion when a company or industry introduces a new standard. Swann analyzes various studies and presents a model of economic effects of standards based on their initial purpose. The model shows how the initial objectives of standardization produce various intermediate economic effects and how these intermediate effects subsequently lead to different ultimate economic effects. Based on the model, the standards have eight distinct purposes of standardization, the division of which follows the mapping of standards presented in chapter 3.1.1. The intermediate economic effects listed are as scale economies, division of labor, competencies, barriers to entry, network effects, transaction costs, precision, and trust and risk. However, the linkage between the purposes of standardization and these intermediate effects is not a straightforward line, but a more complex web of causes and effects. One clear objective of standardization can cause many distinct intermediate economic effects and more than one ultimate economic effect, as shown in Figure 4. Swann lists price, productivity, entry, competition, innovation, trade, outsourcing, and market failure as ultimate economic effects caused by standardization. Swann makes the distinction between the two levels of effects as that of the scope of interest –the latter have received more attention since their scope falls into the interest of policy concerns while the former stays in the scope of professional economists' interest (Swann, 2010).

Figure 4: Eight purposes of standardization and the effects



Source: Swann (2010).

More often, the studies simplify these findings by mapping their results into five distinct categories, which represent a mixture of purpose as well as ultimate economic effects – the effects are mapped as trade, competition, quality, innovation, health and safety, and environment. The last two classes – health and safety, and environment – can be defined as effects that have an impact on the broader community, whereas the first four classes – trade, competition, quality, and innovation – as effects that are more closely connected to the companies' interests. In this thesis, these effects are labelled economic impacts while the former will be referred to as social impacts.

1.2.2.1 Economic Impacts of Standardization

One of the first aims of standardization is to simplify various aspects of a business' processes. When companies make use of standards, they can rely on certain facts that raise the degree of interoperability, which then makes their production or service more cost-effective. Interoperability can be achieved through standardization in two forms – dimensional interoperability, which describes the relationship between two components, and functional interoperability, which can be observed in our computer systems where a user can operate various different products with ease. In addition, standards specify forms of communication like languages, symbols or blueprints that are used across the industry which facilitate faster and more stable business transactions. Standards thus ensure consistency and boost trade of goods and services by facilitating compatibility between partners in the value chain (APEC Sub Committee on Standards and Conformance, 2010). In other terms, standards promote network effects (Cebr, 2015). Furthermore, the interoperability and compatibility of products lowers the cost of designing and producing the products (Swann, 2010). This has positive effects on barriers to trade and cross-border activities by enabling companies to sell their products and services without the need for adaptations to a specific market (Cebr, 2015). Since the same product can be introduced to many individual markets, there is also less of a chance of market failure (APEC Sub Committee on Standards and Conformance, 2010). The companies thus have more opportunities to enter new markets. Furthermore, enhanced trade opportunities and lower transaction costs create more

opportunities for outsourcing which in turn increases productivity of a company (Cebr, 2015). Global value chains become more and more fragmented but standards facilitate their uninhibited activity by enabling cooperation between independent firms and allowing for the diffusion of information (Blind, Mangelsdorf, Niebel, & Ramel, 2017).

Another way in which standards affect trade is by signaling quality to consumers and trade partners. This acts as a boost of confidence between the trade partners and thus forms a better client-supplier relationship. This is especially pronounced in sectors where product compatibility is vital, as is the case in the ICT sector, for example (Cebr, 2015).

In Europe, harmonized standards, which facilitate the European single market, further encourage trade and the expansion into new markets by offering a "presumption of conformity with the legislation and improved ability of businesses to meet legislative and regulatory requirements, without having to go through further conformity assessment requirements" (Ernst & Young, 2015). Bilateral trade agreements serve a similar function as harmonization by specifying mutual standards (Cebr, 2015). In the last decades, we have seen a gradual reduction in the use of national and corporate standards and the rise of international agreements on standards. International agreements have thus "cut international tariff barriers by over 90% of their level of 50 years ago" (Totus, 2002).

There are, however, cases where standards have caused negative effects on trade and export. Although in same cases the negative results seem anomalous, standards have been found to restrict trade in the agricultural sector. Another point that Swann makes is also that standards that are harmonized or part of bilateral agreements can skew the trade relationships between the included and the excluded countries. For example, Swann argues that, although the countries included in the harmonization system certainly benefit from the use of standards, the developing countries, which are excluded from this system, get even more restricted in their export efforts since these standards are stricter than standards in their own countries. Standards can therefore create barriers to trade by restricting import from poor countries (Swann, 2010). An OECD study also identifies this issue and states: "to the extent that standards, technical regulations and certification systems differ across countries, they may act as technical barriers to the flow of trade" (Totus, 2002). From this perspective, national standards are a form of protectionism, which is why countries should strive for international agreements (Totus, 2002). From the European perspective, Blind finds that national standards hinder trade in European value chains, whereas European and international standards support it. While the former provide benefits for inner European value chain's trade, the former boost imports into European market from third countries (Blind, Mangelsdorf, Niebel, & Ramel, 2017). On the other hand, some would argue that standards play a positive role even in the relationship between rich and poor countries by opening up opportunities for companies from the developing world to enter markets in the developed countries (Swann, 2010).

Authors of the ISUG survey assert that the negative effects listed are more anecdotal than supported by hard data. According to the results, trade can be negatively impacted in cases where standards can create skewed benefits between different companies, favoring companies with large home markets, for example. In addition, standardization can potentially affect companies in a negative way when the cost of implementation of a standard are greater than the benefits reaped by the adoption of standard (Totus, 2002).

All quoted studies, however, conclude that the results in general identify the use of standards as having a positive impact on trade and export performance.

The interoperability of products plays a role in competition as well by affecting switching costs. These are lower when companies use standards across the industry since there is less of a chance for a company to fall into a locked in situations with their supplier, which would defer it from seeking a new and better partner. With the use of standards, companies can switch between suppliers faster and less costly hence standards improve choice and thus facilitate competition. This also affects market entry since new entrants need not to produce or design the product from the ground up (Cebr, 2015). Their technical development costs are reduced and can therefore more easily enter the market and compete with the other companies already in the market. Another way in which standards improve competition is through variety reduction. The reduction in variety makes the mass production of products possible. It facilitates cheaper production and enables economies of scale. With these effects combined, the standardized product becomes so ubiquitous that more and more new entrants are drawn into the market, improving competition. A standardized product becomes so universal that other companies have to adopt the standard as well if they want to enter the market at all – an effect also called network externalities (APEC Sub Committee on Standards and Conformance, 2010). This could potentially raise barriers to entry since standards raise compliance costs. These costs could influence some companies' decision to not enter certain markets (Swann, 2010).

Standards can thus serve as a tool for achieving cost competitiveness. Costs that can be lowered by standardization include costs arising from design, drawing time, and materials management time. Lower costs can also be observed in purchase prices of raw materials, holding of inventory, as well as in production set-up, final production time, and maintenance time. Standardization also affect volume, enabling volume-driven cost reductions (Totus, 2002). In addition, in order to achieve consensus, specifications of standards are discussed in detail, considering different, competing ideas. The final result thus represents a middle way which facilitates the largest aggregate cost savings for the market, instead of just one player (APEC Sub Committee on Standards and Conformance, 2010).

But standards do more for competitiveness of a company than just by affecting costs. Standards which address the quality of the product signal to the market that their products meet the needs of the market. By signaling high quality to their customers, standards have a direct effect on of enhancing the image of the company. The companies that have adopted standards are therefore more competitive in the market (Cebr, 2015). Their competitive advantage is especially pronounced in cases where a company adopts a standard which sets quality levels so stringently that not many can achieve them (APEC Sub Committee on Standards and Conformance, 2010).

Part of the cause which enables product differentiation is also due to standardization which causes variety reduction. Standards thus lead to more homogenized products but also enable product differentiation on other attributes besides price – attributes such as product quality, delivery and customer service. Although products are in fact more homogenized, tiny but important differences now make a product stand out. The firms can spend less time on initial product development and focus more on the features that make a product or service exceptional. Consequently, customers or trade partners are offered more choice (Cebr, 2015). With standardization, companies have more possibilities to leverage benefits from outsourcing activities that can be performed by other companies more cost-effectively

(Totus, 2002). However, at the same time, differentiation can become harder to achieve. This can ultimately lead to even more price wars and price erosion instead of less. To avoid these negative effects, companies "must keep [their] core competency areas outside of the scope of standardization" (APEC Sub Committee on Standards and Conformance, 2010).

European Commission recognizes the use of standards is one of the main tools of establishing the European single market. Standards support competitiveness of European businesses, furthermore, the study even lists the improved competition as one of the greatest achievements of the European standardization system (Ernst & Young, 2015).

Standards have been proven to play an important role in innovation process, namely by expediting the process of dissemination of information. Standards make information about new technical developments more readily accessible to all firms, including SMEs which typically cannot afford to employ their own R&D departments. Standards act as a great diffusor of new knowledge which in turn reduces the time to market for inventions, research results and innovative technologies (Cebr, 2015). As a result, standards level the playing field, promoting competition and innovation (Swann, 2010).

The standardization process opens up possibilities for innovative products to become widely spread, effectively producing the critical mass of adopters and users that an invention needs to become accepted in the market. They allow the creation of economies of scale by "focus[ing] demand for innovations that might otherwise be spread over many technical solutions and therefore might lead to a high fragmentation and not sufficient critical masses" (Blind, 2013). In addition, standards ensure focus and cohesion (Swann, 2010). Standardization can thus even facilitate the emergence of technological platforms, such as the Internet or the cellular telephone, where many independent actors can participate in the market (Blind, 2013). Standards can therefore be perceived as tools "to create a common technology framework for further innovation" (Ernst & Young, 2015). Such open standards are in fact desirable because they facilitate "a competitive process of innovation-led growth" (Swann, 2010).

The process itself supports larger stakeholder involvement which "facilitates market-driven innovation and enables user-oriented solutions to be achieved" (Cebr, 2015). In addition, building consensus brings together the knowledge and experiences of various experts which in turn catalyzes innovation (Ernst & Young, 2015). The role of standards in innovation is, therefore, not in "driving the development of new ideas" but in "galvanizing the innovation process" (Cebr, 2015). One of the essential features of standardization is that it "synchronize[s] disjointed technical innovations into a systemic innovation that creates a new market" (APEC Sub Committee on Standards and Conformance, 2010). Shin, Kin and Hwang, however, add that the demand-side of standardization process, namely how the new technology is accepted or not accepted by the users, has not yet be thoroughly examined and could offer more explanation of why certain technologies dominate over others (Shin, Kin, & Hwang, 2015).

Standards in innovation, however, have a dual role – their main role is in information dissemination but can sometimes also be perceived as constraints to innovation. The latter is the case with standards prescribing minimum requirements for aspects of innovation that impact the broader public such as standards specifying environmental, health and safety requirements. A study has showed, however, that companies that find standards more constraining for innovation are companies that are in fact generally more innovative (Cebr,

2015). These companies find that regulations constrain their innovation activities because they are 'pushing the boundaries'. Thus, while standards may constrain some innovation activities, they do not prevent but rather support the development of a product that is acceptable to the broader community by acting as a barrier to undesirable outcomes (Swann, 2010). By controlling various risks, standards therefore help the product by assuring trust into innovative technologies (Blind, 2013).

While the constraining aspect of standardization has been known to exist for some time, only in recent studies the catalyzing effect of standards on innovation has been examined more. Because of this late realization, the benefits of standardization have not yet been thoroughly leveraged by all stakeholders. One of the most important discoveries in recent years demonstrates that standardization helps to bring new knowledge from scientific research into market. Blind thus argues that "there is a large potential for standards and standardization to promote innovation for policy makers" but true policy initiative that could leverage that are still rare. European Commission stands as one of the first governmental institutions to recognize the opportunities and has since included standardization as one of the main innovation policy instruments (Blind, 2013). Currently, only around a third of all European standards are developed with the clear objective of supporting the implementation of European policies, following the requests issued by the European Commission to the SDOs (Technopolis Group, 2012).

Blind, Petersen, and Riillo, however, examine how standards might affect innovation in opposed to how regulation alone might affect it. They find that the degree to which standards and regulation might restrict innovation is heavily dependent on the market environment. They argue that "formal standards lead to lower innovation efficiency in markets with low uncertainty, while regulations have the opposite effect" whereas "[i]n cases of high market uncertainty […] regulation leads to lower innovation efficiency, while formal standards have the reverse effect" (Blind, Petersen, & Riillo, 2017). This is a direct result of information asymmetry. While regulation mainly develops in a top-down approach, formal standards develop in a bottom-up approach – market players therefore have a higher level of knowledge about the actually technology and technological needs which proves to be valuable in uncertain markets (Blind, Petersen, & Riillo, 2017).

One of the reasons why standardization has not yet reached full support when it comes to innovation activities, is the fact that companies still prefer to focus only on intellectual property protection (IPR). The leading innovators in the market normally invest heavily in R&D and want to capitalize on their gains by exploiting new technology on their own as well as generate profit from third party use through licensing fees (Ernst & Young, 2015). But patents can slow down the technology's diffusion and in turn its development, which can be mitigated by the integration of IPR activities and standardization (APEC Sub Committee on Standards and Conformance, 2010). Blind argues that interactions between patents and standards are not only possible but bring many benefits as well for both the innovator and the user of a standard. The integration of IPR and standardization supports the development of technology and allows a temporary monopoly for the owner of the patent. At the same time, this integration could generate additional revenue from licensing fees since more companies will implement the same technology, but it also brings benefits to the buyer of the innovation since transaction costs and licensing costs considerably. There are, however, some challenges and negative effects connected to the integration. The temporary monopoly could inadvertently become a true monopoly which would hinder further innovation. There are also chances that the companies would increase competition in

innovation which would lead to standards wars, ultimately wasting resources and leading to more costs (Blind, 2013).

Another negative effect that standards may have on innovation is due to the lengthy process of standardization which can lead to the development of a standard that already lags behind technical development of the field. However, while certain SDOs have already tried to mitigate this effect by speeding up specific stages in the process, it is important to keep in mind that the process is designed in a way which supports the engagement of various stakeholders. By modifying the process, the standardization system may lose some of its transparency and the depth of consensus (Cebr, 2015). On the other hand, early market adoption of a standard can also hinder innovation by opting for a standard that specifies suboptimal technologies (Ernst & Young, 2015). In other terms, standards can produce lock-in problems to inferior standards (Featherston, Ho, Brevignon-Dodin, & O'Sullivan, 2016). The lock-in effect can also happen quite naturally, when technology has already evolved but the people prefer the inferior products because the cost of retraining people to a new functionality are deemed too high, like the case of QWERTY keyboard layout demonstrates (APEC Sub Committee on Standards and Conformance, 2010).

1.2.2.2 Social Impacts of Standardization

The effects of standards on the broader community are more indirect and thus harder to examine reliably. Hard data are usually hard to come by due to issues of personal information even when the effects could be quantifiable. What, however, can be argued is that standards do contribute to the social welfare more often than they block progress. What has already been discussed is how standards benefit society by influencing trade, competition, and innovation. These standards benefit the consumer by improving choice, quality, trust, affordability, and functionality (Swann, 2010). But a far greater role in helping the progress of society as a whole can be attributed to standards which act as a minimum requirement specifications. These standards ensure the health and safety of community as well as that of the environment by setting certain levels which companies trying to enter the market must reach if they want to enter the market at all (APEC Sub Committee on Standards and Conformance, 2010). Because of their voluntary basis, these standards provide “a valuable stimulus to businesses to do things better, more safely, more reliably and more cost effectively while still offering a lighter touch approach to regulation” (Swann, 2010). Yet oftentimes the standards are integrated into the state’s law framework, as is the case in Europe where certain standards become harmonized and thus mandatory for use.

One problem that concerns these types of standards is their subject matter since these criteria would ideally be created based on scientific ground. Instead, industry consensus is the preferred method since it does offer a more timely solution to the problem (APEC Sub Committee on Standards and Conformance, 2010). The standards produced by consensus still benefit the community, although there is a trade-off between society’s and environmental welfare and the performance of the companies. This is especially true for environmental standards which are often regulated not to the degree that is demanded by the environmentalists (Totus, 2002). Standard setters may, therefore, “directly or indirectly affect decisions on the acceptability of public risk” (Swann, 2010). Too much regulation can also have negative effects on competition. Studies, however, support the notion that standards should be employed in the process of the development of regulation since they help regulators to by making their work more efficient and effective (Swann, 2010).

Health and safety, and environmental standards also serve as a differentiation basis for companies. As is the case with standards which signal product quality, standards can signal to their customers that their products are safe to use or environmentally friendly. These standards thus specify more than just the minimum requirements and are thus harder to implement. Yet once a company adopts a standard, their product becomes more appealing to a segment of customers who value these aspects of the product or service above price. When a company adopts an environmental standard, it could potentially gain a bigger market share by providing value to the more conscientious customer, for example. Standards thus act as a tool to establish trust and to improve the competitiveness of the company (Totus, 2002).

Even though the actual effects of health and safety and environmental standards have not been validated by many studies, the ones that have examined this aspect of standardization demonstrate that in general standards do provide benefits to society. These benefits are observed in the decrease of number of work, home or sport accidents; in better disease prevention; in an improved waste management, energy consumption, and resource use (Totus, 2002). Moreover, these standards bring benefits to the companies by assisting them in meeting regulatory compliance and thus saving costs related to non-compliance as well as reducing public costs or externalities, such as air pollution. In addition, standards can lead to "improved definitions of roles and responsibilities when it comes to risk management (Cebr, 2015).

1.3 Current Challenges in Standardization

Only recently has the topic of standardization been examined more comprehensively. That is why, even though various challenges have already been identified by the stakeholders in standardization, we are still a long way from addressing the issues properly and improving the standardization system itself. I identify two most important challenges that carry implications for the Slovenian national standardization strategy. The two challenges are very much connected – without tackling both at once, neither can be resolved. The challenges are as follows:

1) Stakeholder engagement in standardization.
2) Leveraging standardization capabilities to support trade, competitiveness and innovation on a national level.

The crucial issue that cripples the standardization system globally is the lack of stakeholder engagement. The engagement of stakeholders in the process of standardization is the most central part of the process. Standards are made by consensus and should therefore provide a middle way for all participants – maximizing the balance of all interests (APEC Sub Committee on Standards and Conformance, 2010). If therefore one group of stakeholders does not engage in the process as fully as the other actors do, their interests are not taken into consideration fully. The group of stakeholders thus loses the ability to influence the market and gain advantages from standardization. The nature of today's markets dictates that these stakeholders still have to implement certain standards, however, as merely followers of the process, these stakeholders do not experience the same positive effects (Technopolis Group, 2012).

Cebr's study finds that active participation in the standardization process carries benefits to the company no matter the size. However, the study has also showed that the level of their

engagement remains very weak – only 26 percent of large companies state that they are highly involved and only 10 percent of SMEs (Cebr, 2015). The latter is especially alarming when we consider that SMEs account for 99.8 percent of all business (Technopolis Group, 2012). One of the most prevalent reasons why companies are not participating in the process is due to lack of resources. The involvement can become quite costly, especially for a SME; the process is mainly financed by the companies themselves which normally pay a formal participation fee, provide the salary for the required expert, and pay for additional indirect costs like travel and accommodation. Another reason why companies do not participate in the process is due to lack of experts in a given field which ultimately write the standard (Ernst & Young, 2015). Aside from that, a third equally prevalent reason for the lack of participation is the actual lack of awareness of effects of standards. This may be linked to the fact that companies lack knowledge but could also stem from the fact that not enough has been done from the side of governmental representatives, or other groups that represent societal interests, to communicate the said benefits and educate the public (Technopolis Group, 2012).

SMEs face additional problems that prevent them from using standards let alone setting them. SMEs may face problems of tracing relevant standards due to their lack of technical expertise but also due to the onerous way in which standards are offered and supplied. Company representatives often do not know what standards to look for and do not have the expertise to determine if a standard is up to date and would if implemented offer a valid strategic advantage (Technopolis Group, 2012). Based on the competence model build by Blind and Drechsler, SME's company representatives rarely move beyond the bottom level of hierarchy which comprises of competences relevant for application of standard related knowledge. On this level, a company representative should be able "to know the basic terms used in standards and standardization", should be able "to identify the need for standards", should be able to "search for and select appropriate standards" and should be able to "implement standards in product or process development" (Blind & Drechsler, 2017). However, even when SMEs do have a person who possesses the listed competences, the company is still only a user of standards. The company still experiences positive effects that stem from the use of standards but does not reap the same advantages of standardization. Because of the limited resources, SMEs do not consider standardization one of the priorities and cannot afford to employ someone to work full-time on standardization (Ernst & Young, 2015).

Moreover, SMEs may encounter difficulties arising from the cost of purchase and implementation of standards. Although standards are normally offered at only a cost-covering fee, the costs of implementation might be much greater, especially in highly technological sectors. SMEs may, however, be eligible for governmental aid in reduced fees of purchase (Ernst & Young, 2015). On the other hand, if standards were to become freely available to all, it might compromise the process which is funded with the sale of standards (Swann, 2010). Additional costs are incurred when a company goes through certification process where a company must pay for a third-party service. The language barrier makes additional problems that hinder the application of standards – still only a fraction of standards gets translated into the native language of the users. Because of these barriers, standards may be perceived as a necessary evil instead of a strategic resource (Technopolis Group, 2012).

European Commission has recognized the importance of the issue of SME involvement and has since established and funded "Annex III organizations". One of its more important

current objectives is thus the education of SMEs on the topic of standardization. European Commission recognizes the need for a systemic approach to education, emphasizing the need to incorporate the topic of standardization into high education and vocational training. The EY study argues that "[t]his would not only maintain and continuously improve the quality of European standards, but also help face the increasing standardization needs and strengthen the capacity of ESS." (Ernst & Young, 2015). In Slovenia, both the national SDO and the Chamber of Craft recognize the need for SME engagement and the raising of awareness. SMEs are given opportunities to attend seminars and workshops which aim to educate on the topic of standardization (Technopolis Group, 2012).

In addition to the lack of SME involvement, another issue of stakeholder engagement prevents the system from reaching its full potential; research institutes are an important part of standardization system but are rarely involved in the development process. One of the main objectives of standardization is to aid in dissemination of new technologies, yet the system remains slow at achieving early identification of standardization needs. By building a better link between research institutes and similar entities, standardization would create an environment that stimulates the transfer of knowledge, standardization activities would start earlier to increase the ability of standardization to identify future trends and needs (European Commission. EY, 2015; Zi & Blind, 2014). Zi and Blind find that although involved in standardization, researchers rarely link their research strategies with standardization activities. The effect of the disconnect is the lack of commercial exploitation of important scientific and technological breakthroughs. Blind and Zi argue that researchers lack the incentives to participate in the process more actively. Researchers build their reputations namely through publishing activities in scientific journals and are due to time and budget restrictions less likely to participate in standardization activities. Another reason why researchers do not engage fully in standardization is due to the fact that they prefer to commercialize their results through patenting instead of standardization activities. They argue for the integration of standardization activities into the set of activities eligible for research funding (Zi & Blind, 2014).

The integration of research activities and standardization plays an important part in leading innovation activities and thus achieving the first-mover advantage. The companies leading the standardization system can influence the market and promote their own interests (Cebr, 2015). However, although the system is designed in a way that supports the building of consensus of all member countries, clear differences can be observed between the level of power of different countries participating in standardization system. In Europe, historically countries with higher GDP have been able to promote their own interest more comprehensively, thus gaining more advantages from the system itself. The difference between European countries in their influence on the standardization system has yet to be addressed properly, but one thing is clear, Slovenia and Slovenian companies remain participants in standardization with a low original input of standards. The same holds for countries like China and Korea. Their position in the global standardization system has already been examined in various academic papers from which Slovenia can identify some common features with the late-comer countries. What inhibits the developing countries from reaching full potential of standardization is their fragmentation of institutions and weak capabilities (Zoo, de Vries, & Lee, 2017). Late-comer countries are at a disadvantage in standardization process from the get-go since they have not contributed the core technologies and are thus strongly dependent on patents from other, richer countries. (Ernst, Lee, & Kwak, 2014) Moreover, due to their slow start as well as their lack of resources late-comer countries tend to be positioned as a supplier in the value chain while the historically rich countries

remain innovation and thus market leaders. In addition, the precondition for leading the standardization process is a strong R&D of the companies (Zoo, de Vries, & Lee, 2017). Government plays an important role in supporting and directly investing in innovation activities. (Mazzucato, 2018). Moreover, a strong governmental involvement facilitates standardization by providing incentives which enable new partnerships and strengthen the local and technological capabilities (Gao, Yu, & Lyytinen, 2014). However, while the clear role of the government in the late-comer countries has been identified, few countries have actually established a clear standardization strategy (Zoo, de Vries, & Lee, 2017).

2 EMPIRICAL RESEARCH

While part I (chapter three) of the thesis examined standardization system and its effects in general, the second part examines the benefits of standardization and its stakeholders' engagement specifically in Slovenia.

2.1 Purpose and Research Objectives

In the thesis I set the grounds for determining the effects of standardization on Slovenian companies. The effects of standardization are measured in a number of specific business sectors. First, I want to examine the effect of standards on productivity and competitiveness of the company. Connected to the latter is the analysis of effects that standardization has on communication and cooperation between stakeholders in their value chain and thus the effects that standardization has on opportunities to enter new markets and increase export. I then aim to analyze the impact of standards on innovation as perceived by Slovenian companies as well as identify effects of standardization on some non-monetary elements of business.

In the second part I focus on identifying key stakeholders in Slovenia and gauging their level of engagement in the process of standardization itself. The study focuses on identifying differences between groups, namely identify whether SMEs behave differently and have different attitudes towards standards and standardization than large companies. The empirical research will follow the objectives outlined in Table 4.

Table 4: Research questions

RESEARCH QUESTIONS	***Hypotheses***
Q1: What kind of impact do standards have on the performance of Slovenian companies?	H1: Standards have a positive impact on the firm's performance (competitiveness, innovation, communication between stakeholders, risk management). H2: The effect of standards is dependent on the size of the firm.

Q2: What are the main motives which influence the purchase and use of standards?	H3: The main motive that influences the purchase and implementation of a standard is legislation.
Q3: How engaged are Slovenian companies in the process of standardization?	H4: Slovenian companies are not well-informed on all aspects of standardization. H5: Slovenian companies do not participate in the formal process of standardization. H6: Small-sized companies do not have enough financial resources and know-how to participate in the formal standardization process.

Source: Own work.

2.2 Methodology

The empirical study was performed with the use of three distinct research methods:

1. Desk research
2. Preliminary interviews
3. Survey

Desk research was carried out as a preliminary step of the research study. The literature provided the basis for getting acquainted with the topic, as it provided the basic understanding of the various levels of standardization and the benefits of standardization already identified by other similar studies. In my desk research, I thus relied heavily on the research studies conducted by standards development organizations, namely ISO, BSI Group, and DIN. In addition to foreign sources, I have examined the material published by SIST and examined materials created by other Slovenian stakeholders. An important part of desk research later-on comprised of working papers and other materials created by and for the European Commission.

The desk research served as the guiding material in the preparation of the specific interview questions. The preliminary interviews were then carried out with several experts on the topic of standardization, coming from various Slovenian companies and other organizations that are active stakeholders in standardization processes. The interviewees were chosen carefully by the General Director of SIST, mag. Marjetka Strle Vidali, and were conducted with the help of a semi-structured interview questionnaire. All together ten separate in-depth interviews were carried out. While the name of the interviewees will not be revealed, they have been, however, grouped according to their characteristics as a stakeholder in the process of standardization, as seen in Table 5.

Table 5: The structure and duration of preliminary interviews

INTERVIEWEE	***DATE AND DURATION OF THE INTERVIEW***
CERTIFICATION BODIES AND OTHER ASSOCIATIONS	16.09.2019; 1h 30 min 18.09.2019; 1h 24.09.2019; 30min
COMPANIES	19.09.2019; 1h 45 min 20.09.2019; 45 min 24.09.2019; 45 min 25.09.2019; 45 min 25.09.2019; 30 min
CHAMBERS AND EDUCATIONAL INSTITUTIONS	09.09.2019; 1h 30 min 02.10.2019; 1h 15 min

Source: Own work.

The preliminary interviews served as the basis for creating the survey questionnaire and building upon my understanding of the Slovenian standardization system, identified its specifics and created the grounds for further stakeholder mapping (for transcripts see Appendix 2). The interviewees were chosen based on their extensive experience in the field of standardization and thus outline the view of stakeholders who hold standardization as one of the more important aspects of their business and can therefore be regarded as biased. Because of that, the interviews serve solely for the purpose of identifying important stakeholders in Slovenia and identifying issues observed in the Slovenian standardization. Although interviewees represent different categories of stakeholders, the aim of the interviews was not to present their specific field of standardization but to outline common issues to all.

Analysis of the interviews shows that the Slovenian standardization landscape is far from well-defined and important stakeholders inactive. One of the common opinions expressed by the interviewees was that SIST currently does not provide enough support for the companies, and that the process of active contribution to Slovenian standardization is laborious and digitally poorly supported. What these preliminary interviews also showed was a clear lack of communication between stakeholders. More than one expert also expressed their opinion that the government does not contribute enough of funds to support Slovenian standardization efforts.

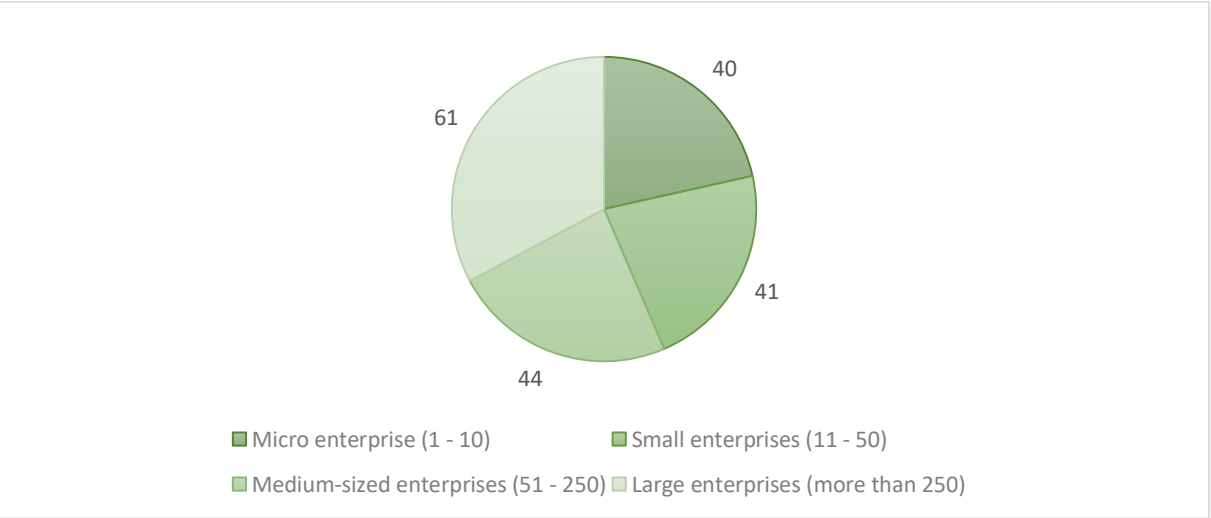
The interviewees however all agree that standardization is an important topic and has far reaching benefits for the companies as well as the economy. On the other hand, the interviews revealed that experts in the field do not believe that Slovenian companies and other stakeholders can transform their role from a follower to a possible leader of the market. The interviews reveal that Slovenian economy remains technically not strong enough to compete. However, the results also demonstrate that the Slovenian standardization system has not yet reached all its potential.

For the interviewees, I was also able to deduct that the use of standards in Slovenian companies is very complex since their usage is heavily influenced by the environment in which they do business. That is why the survey is constructed in a way to try to get a sense of the broader purpose and benefits of standards and tries to avoid going into too many specifics. The survey was designed in a way to gauge the effects of standardization in Slovenian companies, to gauge the level of companies' engagement level in the process of standardization and to evaluate the role of standardization in the Slovenian business

ecosystem. While the preliminary interviews collected answers form different stakeholders, the survey was primarily designed for and administered to the representatives from the companies since companies are inarguably the most numerous and the most important stakeholder in the standardization process.

The survey was administered through the online *1-ka* platform in 2019 and was first tested through two pilot interviews. The link to the online survey was diffused through various newsletters, including that of SIST, Managers' Association of Slovenia, and SIQ. In addition, a direct invitation to the survey was sent to several experts in the field of standardization as well as numerous representatives of Slovenian companies via LinkedIn, targeting professionals who understand the use of standards in their respective companies. The main targeted keywords were thus "R&D Engineer", "Chief of R&D", "Sales Manager", "Quality Manager", "CEO", and "Owner". The sampling method was predetermined as based on the companies' size with the target of the questionnaire in terms of reach was set to at least 40 answers in each of the four sampling categories – micro companies, small companies, medium-sized companies, and large companies. The sample on which further statistical analysis was made thus comprises 61 responses from representatives of large enterprises, 44 responses from representatives of medium-sized enterprises, 40 responses from representatives of small enterprises, and 41 responses from representatives of micro enterprises (see Figure 5).

Figure 5: Sample structure and size



Source: Own work.

Reaching the goal in terms of the number of responses in each category turned out to be extremely difficult which only goes to show that the topic of standardization is still a rather obscure topic in Slovenia. Altogether, 754 people clicked on the link of the survey and, presumably, read the invitation to complete the survey. However, only 325 people actually participated in the survey. Of these 325 responders, only 192 people completed the survey completely, while the other 133 responders only partially. The survey was available for almost two months and the collecting of responses took an enormous amount of effort. As expected, it was especially hard to reach the set goal in the category of micro and small companies which may already be taken as an indication of lack of proper stakeholder engagement on the part of SME.

Of the 192 responders who have competed the questionnaire, 75 percent work in an export-oriented company while 25 percent only do business in a domestic market. The responders in the sample come from very different industries that range from the automotive industry, construction industry, chemical industry, mechanical and electrical engineering, textile industry, utilities industry, to education industry, and professional services industry. The sample thus comprises companies with vastly different needs which the current survey was not able to cluster into distinct categories of users. What this study was able to do was analyze the answers based on the differences between companies based on their size and market orientation.

The sample is also constructed with companies from all three levels of engagement – 67 of responders come from companies who are only users of standards, 91 responders come from companies that also monitor the issuance of standards, and 36 responders come represent companies that actively participate in the process of standardization. The sample was also able to get responders who are already active members in SIST (39 responders), and responders who represent companies that are not yet members (147 responders).

The questionnaire was mostly designed in the form of a five-point Likert scale, the results of the survey are thus mostly attitudinal in nature. The scale was then analyzed in two ways. For the purpose of statistical analysis, the variables were treated as ordinal and analyzed with non-parametric tests. The analysis focused on finding differences between the four groups by starting with Kurskal-Wallis H tests (alpha = .05), and when the tests showed that there is a statistically significant difference between groups, the data was further analyzed with Mann-Whitney U tests (alpha = .009) to identify between which groups the differences actually lie. The data were also briefly treated as intervals for the purpose of reduction of dimensions and analyzed with ANOVA tests (alpha = .05) and further analyzed with T tests (alpha = .009).

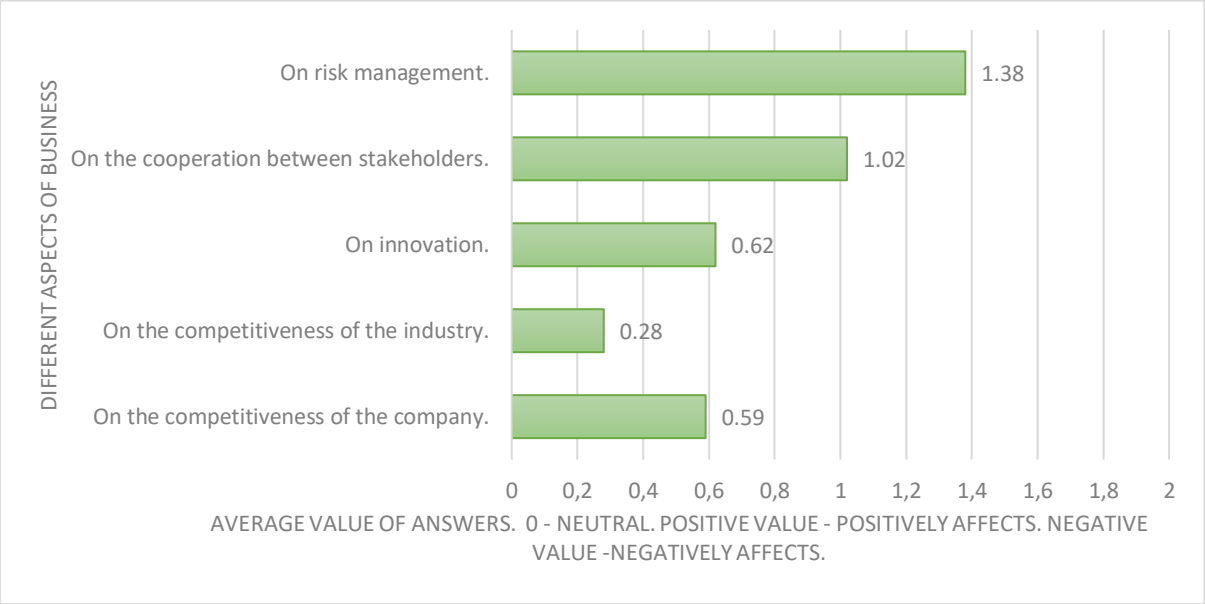
2.3 Analysis of the Results

The preliminary interviews of the study revealed that Slovenian companies compete in a market where standards have become an indispensable part of doing business. Companies of all sizes must implement certain standards, the use of which is dictated by the global market, if the company wants to remain a competitor. The interviews also revealed that Slovenia has several experts on standardization who understands its value but feel that Slovenian stakeholders currently do not do all to fully realize the potential of standardization. The key findings of this study confirm the findings of foreign research and present the effectiveness of the Slovenian standardization system.

2.3.1 The Effects of Standardization on the Slovenian Companies

Slovenian companies identify positive effects of standardization in all aspects. Figure 6 shows the aggregate results of how standardization affects main fields of relevance – risk management, cooperation between stakeholders, innovation, and competition. The surveyed company representatives recognize that standards had a positive effect on business in their respective companies. The positive effects are especially pronounced in risk management (Mean = 1.38, [-2; 2]). The second business aspect which responders have found to be strongly positively affected is cooperation between stakeholders (Mean = 1.02, [-2; 2]). The aspect which seems to be the least affected is competitiveness of the industry (Mean = 0.28, [-2; 2]).

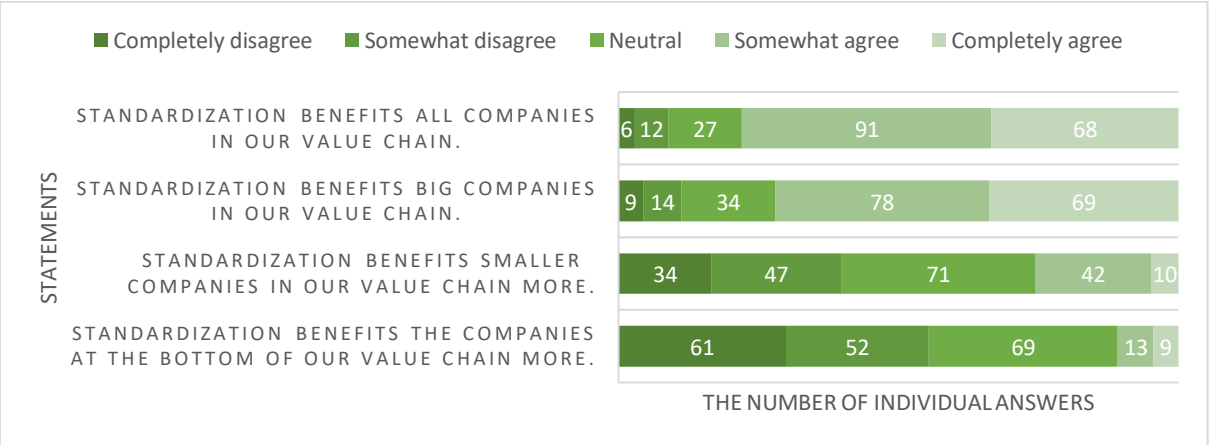
Figure 6: The aggregated effect of standardization on different business aspects



Source: Own work.

The results of the survey also confirm that all companies attain benefits with standardization, regardless of their position in the value chain (see Figure 7). There are, however, differences in the extent of the positive effects that a company experiences based on the size of the company – the results reveal that Slovenian company representatives perceive standards as of having a stronger positive effect on bigger companies in the value chain. The results are statistically significant. Differences between groups have been identified and confirm that large companies more strongly agree with the statement that standardization benefits all companies in the value chain (Kurskal-Wallis H test, P = 0.029, N = 186). The Mann-Whitney U test further identifies that statistically significant differences exist between small companies and large companies (P = 0.003, N = 102).

Figure 7: The effects of standardization on the value chain

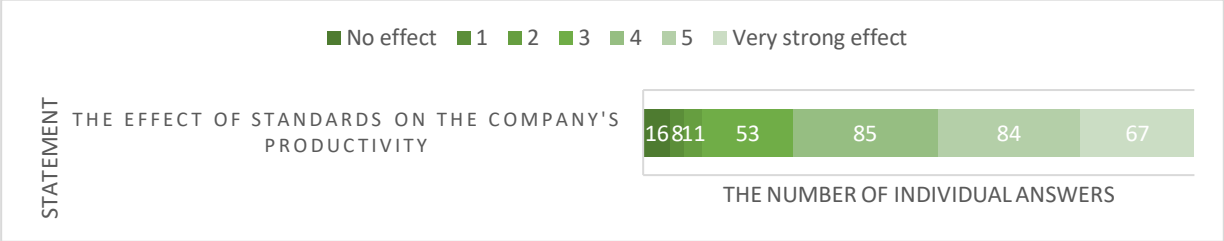


Source: Own work.

2.3.1.1 Monetary Effects of Standardization

I have not employed the same econometric model as DIN or other studies namely because of lack of data. The results of the survey however indicate that standardization has a strong effect on the overall productivity of companies. 73 percent of responders agree that standards boost their company's productivity. Companies, regardless of their size, feel the impact that the implementation of standards has on their company, but differences between the groups have been identified (Kurskal-Wallis H test: P = 0.016, N = 186). Small, medium and large companies observe a greater impact of standardization on productivity, while micro companies do not feel this impact as intensely. The Mann-Whitney U test confirms that there are differences between micro-companies and large companies (P = 0.004, N = 101) (see Figure 8). The greater positive impact of standards on productivity is felt by companies that are export-oriented, but the difference between the groups is not statistically significant (Kurskal-Wallis H test, P = 0.303, N = 192).

Figure 8: The size of the effect of standards on productivity.



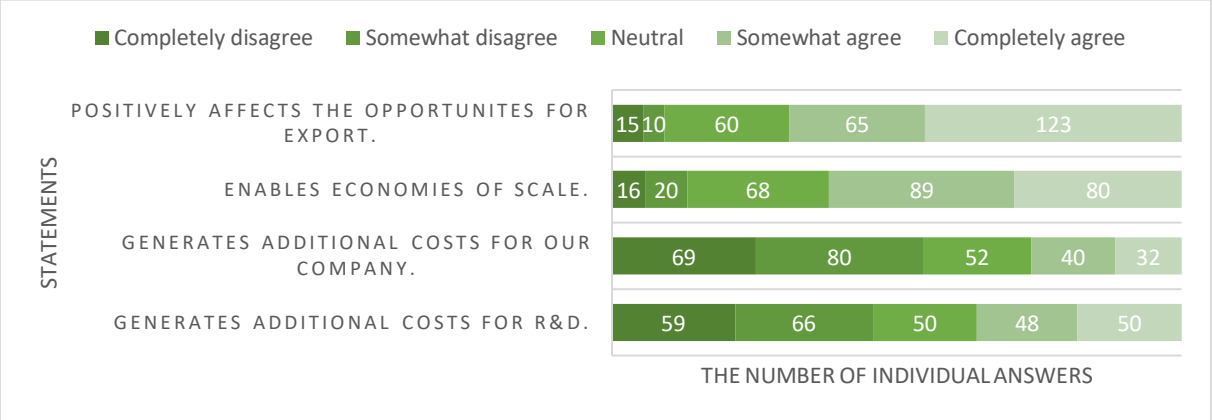
Source: Own work.

Figure 9 depicts the results of the study which show how responders perceive the effects of standardization on the competitiveness of their companies. The results show that standards boost export opportunities (Mean = 0.99, [-2:2]) – 69 percent of responders agree with this statement. The results show that the use of standards may enable economies of scale for companies but also reveal that it may generate additional costs for the company both in general and in the field of R&D. Statistically significant differences between groups based on their size exist in terms of impact of standardization on export opportunities (Kurskal-Wallis H test, P = 0.018, N = 186). Larger companies identify the positive effects more strongly, however, the Mann-Whitney test finds no statistically significant differences that could confirm this statement (alpha adjusted to 0.0085). There are also statistically significant differences between the groups in terms of additional costs experienced by companies due to standardization (Kurskal-Wallis H test, P = 0.020, N = 186). A closer look confirms that statistically significant differences exist between medium-sized companies and large companies where medium-sized companies experience the burden of these costs more greatly (Mann-Whitney U test, P = 0.002, N = 105). The testing does not indicate differences between large and small and micro-sized companies which could be interpreted as a result of lower level of engagement of these companies – small and micro-sized companies may not experience the burden of costs that strongly because they put less effort in standardization. Another reason why these companies do not experience the same burden of costs is because smaller companies may be less technologically advanced.

The difference between the groups in terms of enabling economies of scale is also statistically significant (Kurskal-Wallis H test, P = 0.032, N = 186). Further testing reveals that medium-sized companies and large companies experience standardization differently

(Mann-Whitney U test, P = 0.006, N = 105). Medium-sized companies agree less with the statement that standardization allows economies of scale to be achieved. This suggests that medium-sized companies lack additional competencies which would help with achieving this objective.

Figure 9: The effects of standardization on the competitiveness of the company

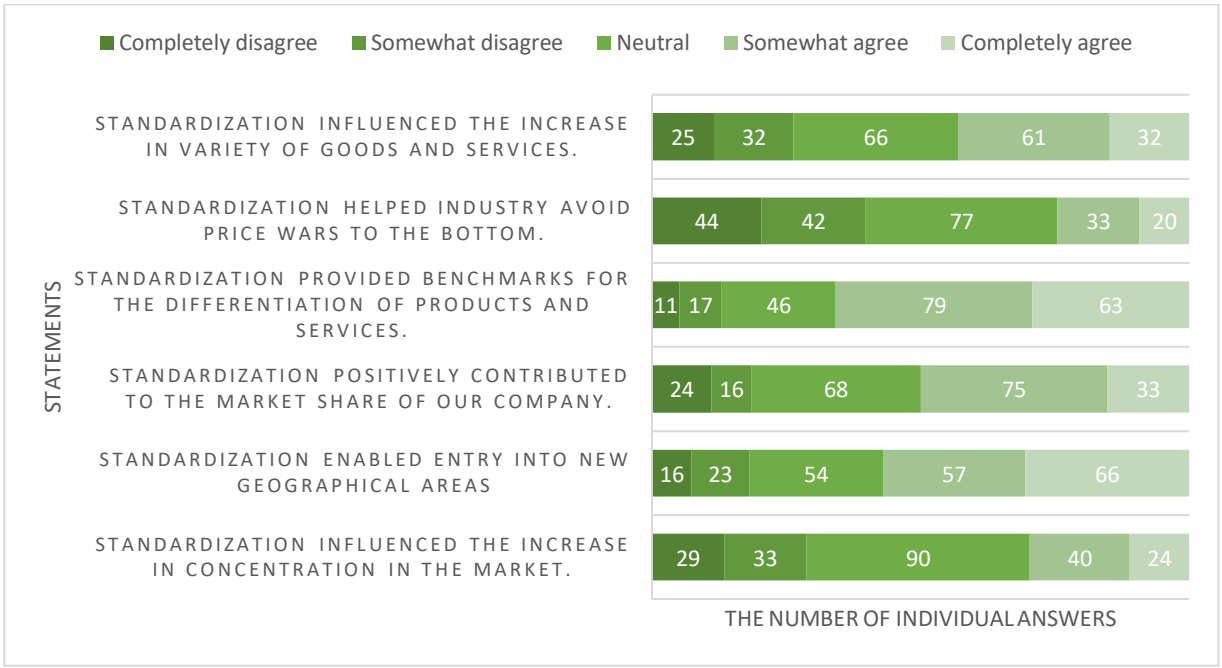


Source: Own work.

When asked about the effects of standardization on the various aspects of the competitiveness of the industry, the respondents were less sure of its effects (see Figure 10). The mean of all answers thus remains close to the neutral position in the cases of statements concerning the effect of standardization on price wars, variety of goods and services, the market share of the company and the concentration in the market. This does not confirm the results presented by Cebr, where the data clearly indicate that standards help prevent price wars, lower barriers to entry and thus increase market concentration but may, at the same time, have also have negative effects on the variety of goods and services (Cebr, 2015). The respondents were more in agreement with the statements regarding how standardization provides benchmarks for the differentiation of products and services and whether standardization enables entry into new geographical areas. In both cases, company representatives generally agree with the statements, however, only by a small margin – 57 percent of responders agree that standardization enables entry into new markets and 66 percent agree that it provides benchmarks for the differentiation. In contrast, only 25 percent of them agree that standardization has prevented price wars.

Statistically significant differences between groups exist in the data obtained regarding the effects of standardization on the concentration of companies in the market (Kurskal-Wallis H test, P = 0.017, N = 186); where greatest differences are identified between micro-sized companies and large companies (Mann-Whitney U test, P = 0.005, N = 101). A possible interpretation of results could suggest that micro companies' representatives were less decisive in their answers – possibly due to their lack of proper understanding of the effects of standardization, possibly due to their small role in the industry. There were also statistically significant differences between groups identified regarding the impact of standardization on the diversity of goods and services (Kurskal-Wallis H test, P = 0.026, N = 186), while further statistical processing did not detect statistically significant differences compared to individual groups (Mann-Whitney U test).

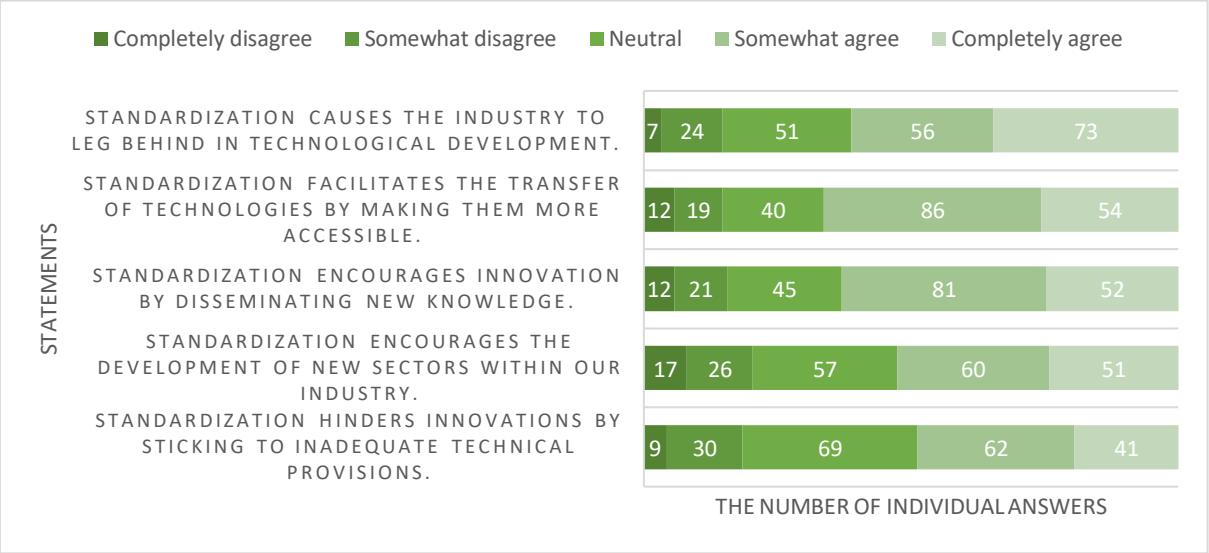
Figure 10: The effects of standardization on the competitiveness of the industry



Source: Own work.

More unambiguous are the results that explain how Slovenian companies perceive the impacts of standardization on innovation (see Figure 11). The data show that companies identify positive effects of standards on the transfer of technologies (Mean = 0.72, [-2; 2] or 66 percent of responders); they agree that standardization encourages innovation (Mean = 0.66, [-2; 2], or 63 percent of responders); and agree that standardization encourages the development of new sectors (Mean = 0.48, [-2; 2], or 53 percent of responders). They do not agree with the statements that standardization inhibits innovation due to inadequate provisions in the standards (Mean = -0.68, [-2, 2]), nor do they agree with the claim that standardization causes the industry to lag behind in technological development (Mean = -1.02, [-2, 2]). Statistically significant differences do not exist.

Figure 11: The effect of standardization on innovation within the industry

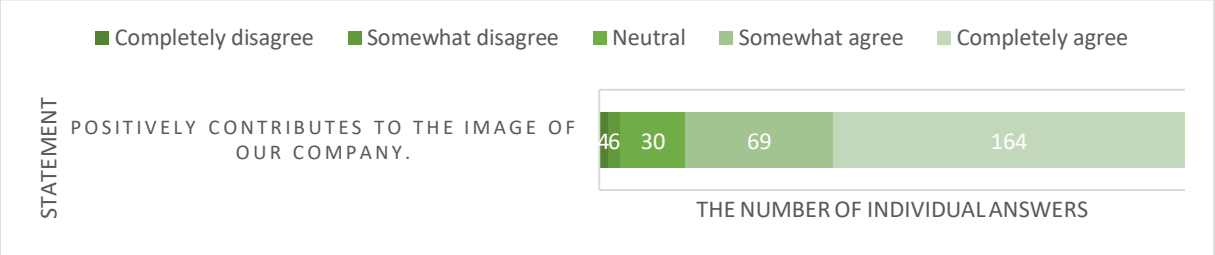


Source: Own work.

2.3.1.2 Non-monetary Effects of Standardization

Figure 12 shows that Slovenian companies regardless of size observe positive effects that the use of standards have on the image of their companies. The mean of answers at 1.4 thus indicates strong agreement with the statement. In other terms, 85 percent of responders agree with the statement that standards do improve the image of the company.

Figure 12: The effects of standardization on the image of the companies

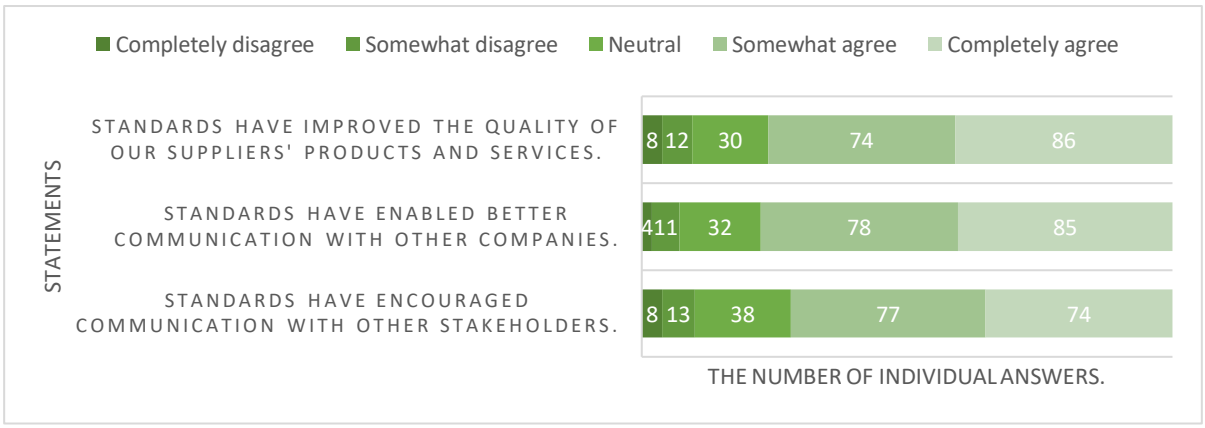


Source: Own work.

The results also show strong agreement with the statements regarding the effects of standardization on the cooperation between stakeholders (see Figure 13). Standards encourage cooperation with other stakeholders (Mean = 0.93, [-2; 2], or 72 percent of responders), enable better communication with other companies (Mean = 1.09, [-2; 2], or 78 percent of responders), as well as improve the quality of products and services among stakeholders (Mean = 1.04, [-2; 2], or 76 percent of responders). Statistically significant differences between groups exist in the case of the impact of standardization on the quality of products and services of suppliers (Kurskal-Wallis H test, P = 0.036, N = 186). The Mann-Whitney U test confirms that there are statistically significant differences between micro-companies and large companies (P = 0.005, N = 101), where large companies feel the impact of standardization more strongly (micro-companies: Mean = 3.65; large companies: Mean = 4.14; Min = 1, Max = 5). There are also statistically significant differences between groups in the perception of the impact of standardization on stakeholder cooperation (Kurskal-

Wallis H test, P = 0.019), where large companies feel the impact more positively, but the Mann-Whitney U test does not statistically confirm this.

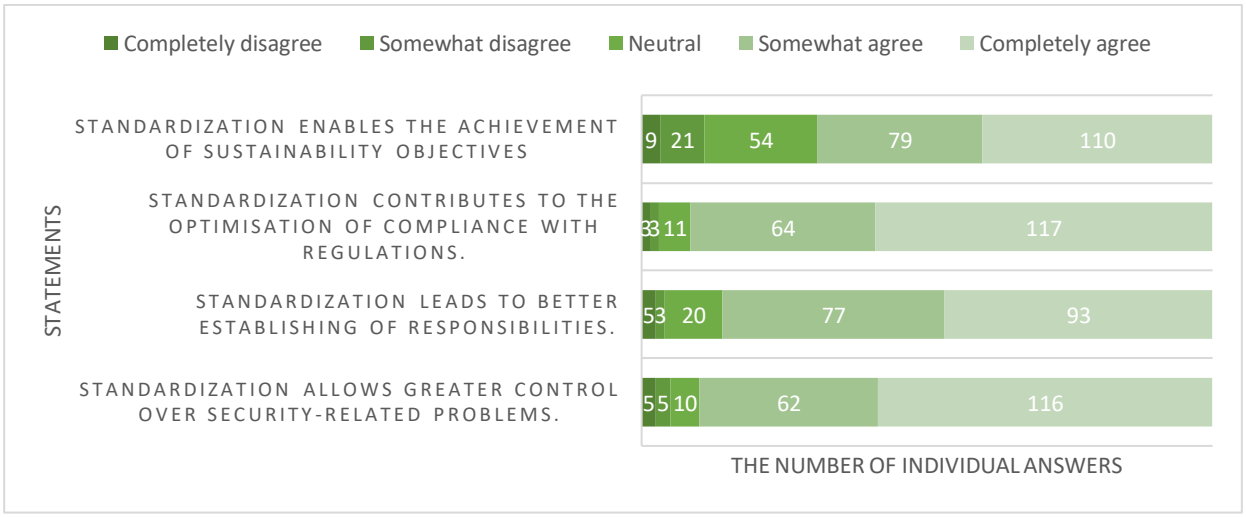
Figure 13: The effects of standardization on cooperation between stakeholders



Source: Own work.

Another aspect where survey showed strong agreement with the statements which describe positive impacts of standardization is risk management (see Figure 14). Standardization allows greater control over product and service safety issues (Mean = 1.41, [-2; 2]), helps towards achieving objectives of sustainability (Mean = 0.95, [-2; 2], leads to better definition and allocation of responsibilities (Mean = 1.26, [-2; 2]), and contributes to the optimization of compliance with regulation (Mean = 1.46, [-2; 2]). In other terms, 69 percent of responders agree that standards help them with reaching their sustainability objectives, 86 percent agree that standards lead to better establishing of responsibilities, 90 percent agree that standardization allows greater control over security-related problems, and, finally, 91 percent of responders agree that standardization contributes to the optimization of compliance with regulations.

Figure 14: The effects of standardization on risk management



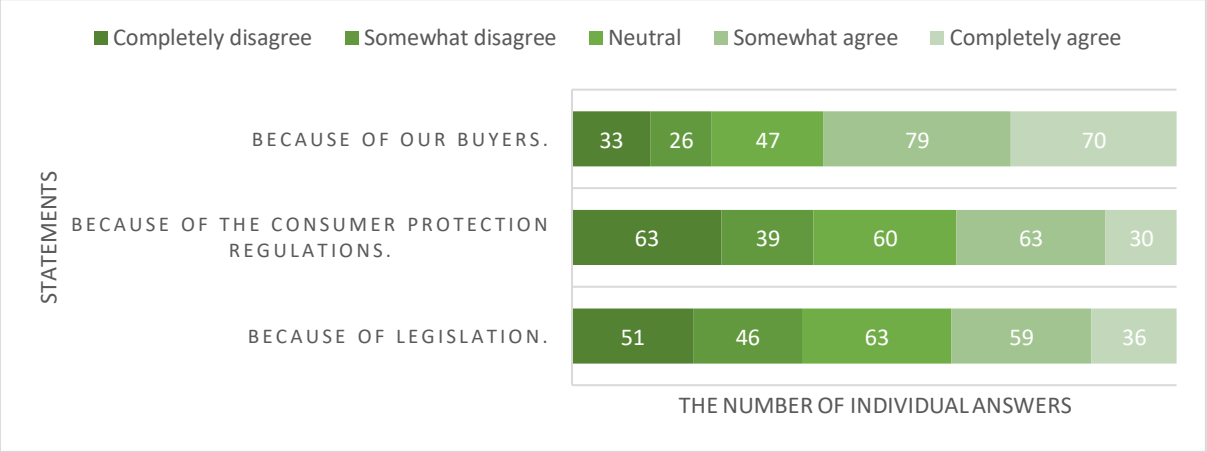
Source: Own work.

2.3.2 The Engagement of Stakeholders in Slovenia

One of the main assumptions that guided the structure of the survey was that Slovenian companies remain fairly inactive in the process of standardization and generally assume the role of followers. The questions were structured in a way to test this assumption while also keeping in mind that the questions may be hard to answer for some of the participants of the survey. Some questions are therefore structured in a way to indirectly check the level of understanding of the standardization system and its effects.

Based on the insights gained from preliminary interviews, it was clear that Slovenian companies normally have an exterior motive for the purchase and use of new standards. Figure 15 shows that the biggest external motive for buying is the influence of a buyer. This corresponds to the fact that Slovenian economy is largely structured as a supplier to other, richer countries in the EU. Standards thus generally serve the purpose of compatibility and interoperability. Differences between groups are not statistically significant thus the same is true for companies regardless of their size. Although the companies buy standards presumably because of their foreign buyers, the survey revealed that SIST is still the first option for purchase for many of the responders – 107 participants in the survey buy their standards with SIST, the next option for purchase is ISO with 75 answers, followed by DIN with 34 answers. However, 35 of the participants in the survey admit that they do not know where their company buys standards, which does indicate that some survey responders lack knowledge in the topic, making the collected data partially inconclusive. Based on the preliminary interviews, companies buy in foreign SDOs only when the national SDO does not have a certain standard available, they then turn directly to European and international organizations that are the original issuers of a standard.

Figure 15: Exterior motives for the purchase of a new standard

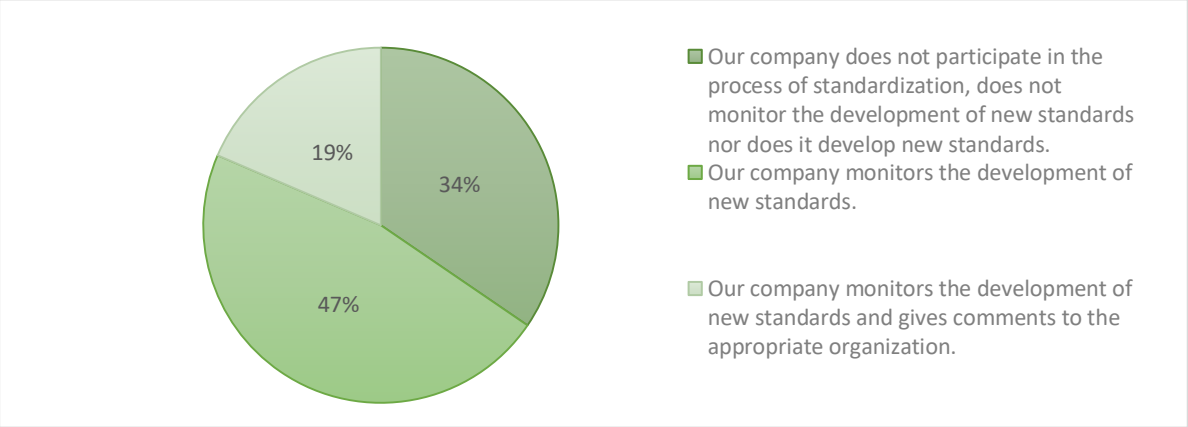


Source: Own work.

The level with which Slovenian companies participate in the standardization process was tested by asking the survey responders to categorize their company's activity in standardization. The results showed that 34 percent of survey responders say that their company does not participate in the process; 47 percent of the responders say that their company does participate but only by monitoring the development of new standards; only 19 percent of the responders say that their company actively participates in the process (see Figure 16). Further statistical analysis finds that statistically significant differences between

groups exist (Kurskal-Wallis H test, P = 0.046, N = 186), while with the loss of power the Mann-Whitney U test does not identify which groups have responded differently than others as the results are not statistically significant (Mann-Whitney U test, P = 0.041, N = 101). The assumption remains that large companies are more active since they have more resources to employ.

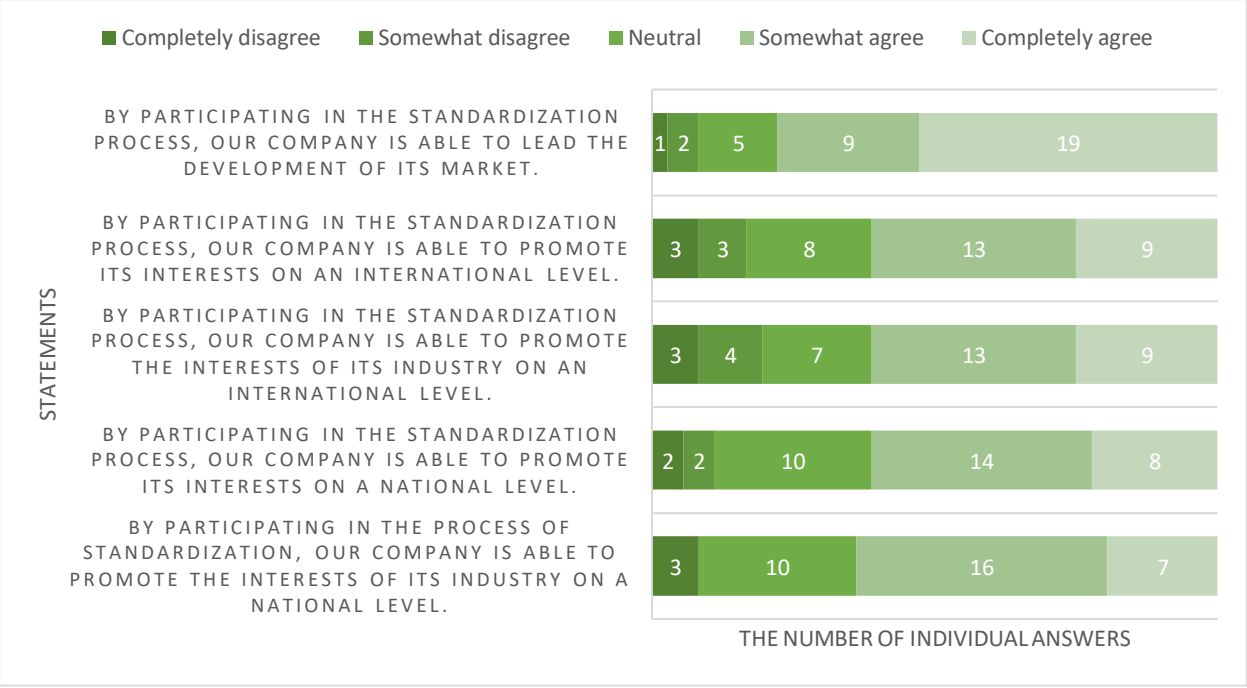
Figure 16: The level of cooperation of Slovenian companies in the process of standardization



Source: Own work.

As shown in Figure 17, the companies that do participate in the process actively confirm that they experience positive effects because of it. Companies that participate get more opportunities that allow them to lead the development of their market since they can influence the properties of the new standards; companies get to promote their own interests at the international and national level, as well the interests of their industry.

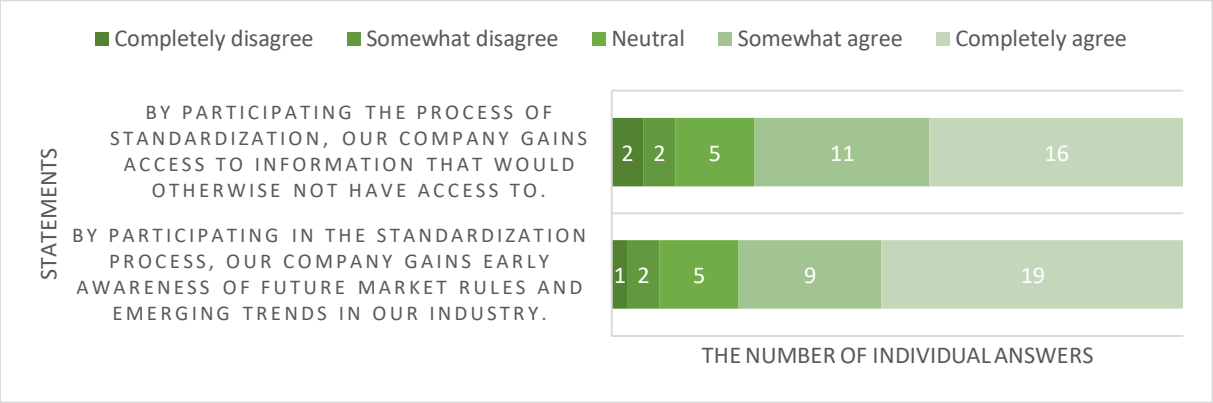
Figure 17: The effects of participation on the ability to promote the company's and the industry's interests



Source: Own work.

Moreover, Figure 18 shows that companies participating in the standardization process strongly agree that their participation enables them to have an early awareness of the future of market regulation and of trends in their own industry (Mean = 1.19, [-2; 2]). In addition, survey responders confirm that participation in the development process allows the companies to have access to information that they would otherwise not have access to (Mean = 1.03, [-2; 2]).

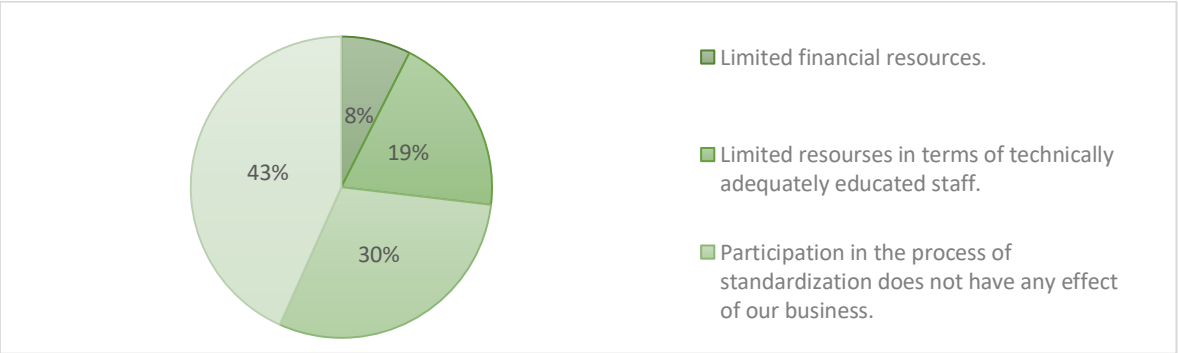
Figure 18: The effects of participation on the diffusion of knowledge



Source: Own work.

Interestingly, the results show that limited financial resources are not the main cause of poor participation of companies - only 8 percent of survey responders who said that their company does not participate picked limited financial resources as the main cause (see Figure 19). Neither is the limited resources in terms of technically-savvy staff (19 percent of survey responders). The real causes of poor participation remain unknown and difficult to pinpoint (43 percent of survey responders answered "None of the above"). This confirms results of other similar studies which have identified issues of comprehensive identification of reason for poor participation (Cebr, 2015; European Commission. EY, 2015). Results also show that 30 percent of survey responders believe that participation will not have any effect on their business. The reason behind these beliefs has not been identified with the survey but interpretations could point to poor understanding of the effects as well as poor general awareness of the companies. Another possible interpretation could also argue that Slovenian companies do not participate actively in the development process because of their role in the supply chain – they have no interest because they merely follow the buyer.

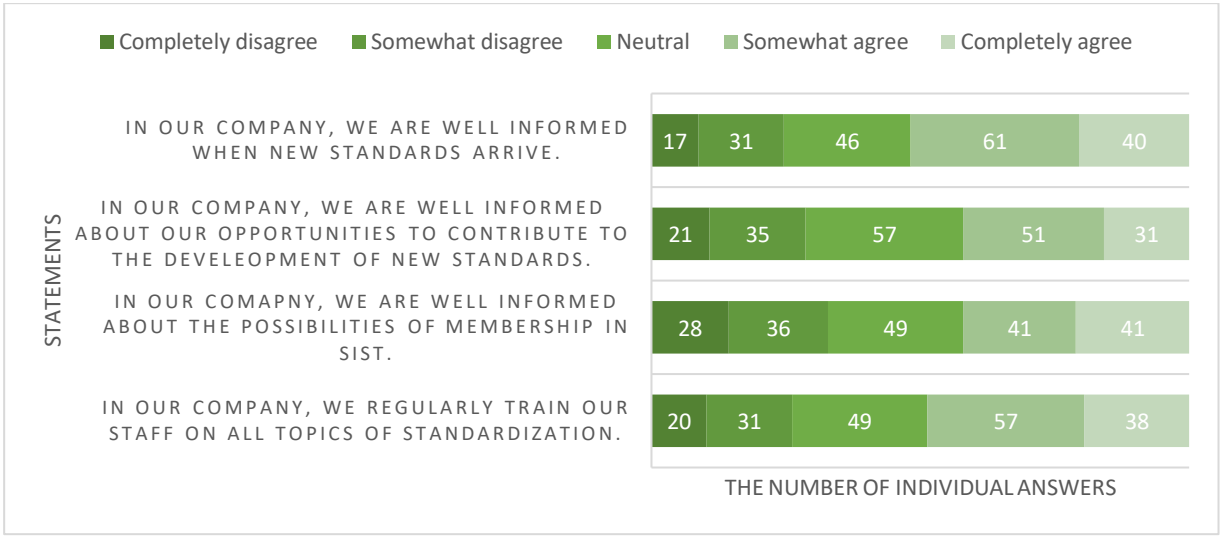
Figure 19: Reason for the companies' lack of participation in the process of standardization



Source: Own work.

One of the important aspects that this survey tried to examine is the general awareness of Slovenian companies on the topic of standardization. Figure 20 demonstrates that although the companies in general agree with the statement, low positive mean indicates that there is still a lot of room for improvement. The companies thus lack information about possible opportunities to improve their market position with standardization. They are not well informed about the issuance of new standards (Mean = 0.39, [-2; 2]) since only 21 percent of responders state that they are well-informed about their opportunities; they also lack understanding about their possibilities to contribute in the development process (Mean = 0.18, [-2; 2]) where only 16 percent of responders say they have a good understanding of it. In addition, they show very low awareness of the possibilities of becoming a member of SIST (Mean = 0.16, [-2; 2]). The results also demonstrate that although some companies do train their staff on the topic of standardization, there are many that do not (Mean = 0.32, [-2; 2]). For the aggregated data on the topic of company awareness, statistically significant differences between groups exist (One-way ANOVA test, P = 0.010, N = 186). The largest differences exist between micro enterprises (interval = [2.86; 3.54]) and large companies (interval = [3.34; 3.84]), where large companies show a higher level of general awareness. However, the t-test does not confirm the differences between individual groups.

Figure 20: Awareness on the topic of standardization in Slovenian companies



Source: Own work.

That companies are not fully aware of all possibilities is further demonstrated by the low membership rate of Slovenian companies in SIST. Currently, only 21 percent of respondents are also members of SIST. Furthermore, only 43.5 percent actually understand the role of a national SDO in an international context – 56.5 percent of responders are unaware of the fact that SIST facilitates participation of Slovenian companies in the development process for new standards (see Table 6). Even more alarming is the fact that approximately 70 percent of responders do not know that companies can access drafts of new standards for free. Companies could take this opportunity to access the almost valid standard as the final issue will usually only slightly differ from the draft. Survey responders also reveal that companies do not know that they can turn to SIST for free help – only 26 percent of responders are aware of the fact. These results could indicate poor understanding of standardization among the survey responders, limiting the reliability of the study.

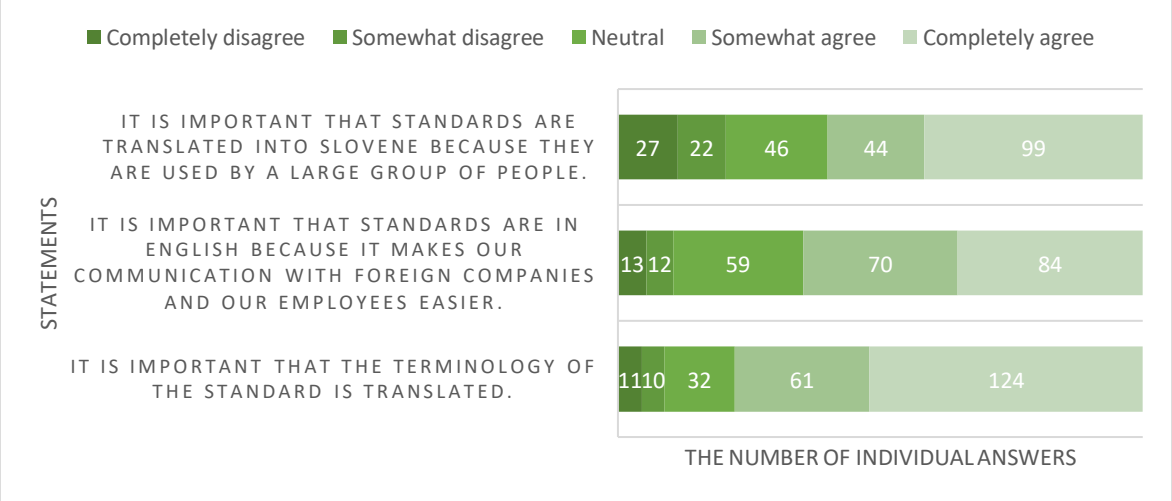
Table 6: The awareness of companies about SIST's offer

	AWARE OF THE FACT	***UNAWARE OF THE FACT***
With the help of SIST, the companies can participate in the process of new standards development on a European and international level.	43.5 percent	56.5 percent
SIST offers access to view the draft of all new standards.	30.7 percent	69.3 percent
SIST's information point offers free help to companies.	26.0 percent	74.0 percent

Source: Own work.

One of the identified issues that contributes to poor awareness of companies and their representatives is that standards can be complicated to grasp, especially when not translated. One of the main purposes of a national SDO is thus to translate important standards. Several of the interviewees have identified that as the most important activity of SIST but data show that on average only five standards per year are fully translated (Slovenian Institute for Standardization, 2020). Interviewees have also expressed negative opinions regarding the slow and infrequent translation of standards the harmonized standards – standards that are legally binding. Currently, SIST does not have enough resources to satisfy this demand for translation, that is why an alternative way seems more attainable – the terminology of a standards should be translated in all cases. Figure 21 shows that survey responders strongly agree with the proposed solution (Mean = 1.16, [-2; 2] or 78 percent of responders

Figure 21: The importance of language used in standards



Source: Own work.

The issue of translation has been brought up several times in the interviews with the experts as this seems to be the subject of great disagreement. The issue, however, is far too simplistic to address the real issue of lack of stakeholder engagement in Slovenia. Based on the results of the interviews with experts in the field of standardization, Slovenia is still far from levering all of possibilities of standardization. Interviewees exhibits certain cynicism regarding Slovenia's possibilities of leading the development of new standards. Interviews reveal that experts think that Slovenia has no chance in entering the competition of countries in development of new standards. One of the reasons lies in sheer numbers which Slovenia does not have and thus cannot gather the critical mass of new adopters. One company cannot

succeed in developing a new standard on its own. Another issue faced is also the problem of Slovenia's economy which namely consist of suppliers to foreign markets. There have been some attempts in the past, namely in the case of Blockchain standardization, but the companies involved in the process soon realized that the costs of development are higher than previously presumed. The interviewees thus reveal that Slovenia's prospects as the lead in the development of possible new standards are slim.

They do, however, point out that Slovenian companies could leverage a lot more benefits of standardization than they do now. The experts reveal that companies that do actively participate in the process express the need for better support from the national SDO as well as the government. These companies want more support from SIST in the possibilities of participation in the international committees. The companies' and thus national representatives must finance their participation themselves which limits the possibilities of involvement for many companies. Furthermore, SIST and other Slovenian stakeholder should try to host various standardization activities more actively. One common denominator of all results of the interviews with the experts is that Slovenian government must grant more financial support to the institute and other standardization activities. Standardization thus remains a secondary objective, even though its role in achieving the goals of the national strategy has been outlined clearly.

2.4 Summary and Discussion of Key Findings

The empirical part aimed to answer three research questions: (1.) What kind of impact do standards have on the performance of Slovenian companies?; (2.) What are the main motives which influence the purchase and use of standards?; and (3.) How engaged are Slovenian companies in the process of standardization?

The results of the study show that Slovenian companies find clear benefits of standardization in the everyday aspects of their business. The study reveals that standardization positively impacts cooperation between stakeholders, boosts innovation capabilities, boosts export, facilitates competitiveness of the company, and enables the optimization of risk management. The results show that Slovenian companies find the latter to be the most evident of benefits of standardization. Standards thus ensure that the company avoid future costs by being on top of new safety, security and quality compliance issues. Another benefit of standardization identified by the majority of the survey responders is the affect that standardization has on the image of the company. Standards provide benchmarks for further product or service differentiation and thus enable the company to distinguish its products and services form others. The results showed that although companies do agree with the statements that standardization helps them in promoting the competitiveness of the industry, the results show that survey responders are less convinced of its positive effects compared to aspects like risk management. The results also demonstrate that large companies currently seem to experience more benefits from the use of standards than smaller entities.

In this study I thus conclude that the hypothesis one, which states that standards have a positive impact on the firm's performance, was proven correct (see Table 7). The same results have been observed in other, similar studies. In Cebr's study, which was the basis for my research, in general, more than half of the firms surveyed confirm the benefits of standards and the standards development process on these business aspects. Similarly, Cebr's study also finds that standards have by far the most impact on the risk management of the company (Cebr, 2015).

The study also confirms hypothesis two since we see that the size of the company is an important aspect affecting the size of the effects of standards. The fact that smaller companies do not reap the same benefits as larger entities has been observed in the study conducted by GHK/Technolopis for the European Commission, and their inclusion in the standardization process has since become one of the priorities of the European standardization system (GHK & Tehnopolis, 2009).

The study also shows that Slovenian stakeholders remain largely passive in the process of standardization. Only 19 percent of survey responders say that they actively participate in the development process. Furthermore, the results show that Slovenian companies are largely unaware of all the possibilities available for them to engage in the process. Consequently, the companies do not know that their participation in the process could bring additional benefits unattainable to those that just purchase the standard after the process is complete. The results how that the companies that do participate, find clear benefits of participation, especially in the enhanced opportunities to access information early on. The companies can thus gain insights into new trends and possible new regulations, avoiding possible future costs of compliance and compatibility issues. Similar results have been obtained in the Cebr study where only 32 percent of the firms surveyed are involved in the standards development process while over two-thirds are not (Cebr, 2015).

The results indicate that Slovenian companies act as followers in the global standardization system, buying only standards dictated by their buyers. These results reject hypothesis three since the main reason why Slovenian companies purchase and implement a standard is not legislation but the buyer. The results, however, do confirm hypotheses number four and five, which presuppose that Slovenian companies are not well-informed on all aspects of standardization and consequently do not participate actively in the formal process of standardization.

The study was unable to accurate conclude the reasons why companies do not engage more actively in the process. Limited financial resources and technically inadequately educated staff do not seem to explain their lack of involvement. The true reasons could lie in the lack of awareness of the possible benefits and the possible access points for companies. Still, the results indicate that large companies do participate more, which sets clear objectives for SIST and the government in the strategy to improve the system. Hypothesis number six thus, although not rejected, remains unproven. Similar results have been observed by other studies. The study conducted by EY commissioned by EC has similar trouble of pinpointing the exact issue while they do conclude that the problem is a combination of various circumstances – from the lack of awareness and lack of knowledge, to the lack of financial resources (Ernst & Young, 2015).

Table 7: Key findings

Hypotheses	***Conclusion***
H1: Standards have a positive impact on the firm's performance (competitiveness, innovation, communication between stakeholders, risk management).	Accepted
H2: The effect of standards is dependent on the size of the firm.	Accepted
H3: The main motive that influences the purchase and implementation of a standard is legislation.	Rejected
H4: Slovenian companies are not well-informed on all aspects of standardization.	Accepted
H5: Slovenian companies do not participate in the formal process of standardization.	Accepted
H6: Small-sized companies do not have enough financial resources and know-how to participate in the formal standardization process.	Unable to conclude

Source: Own work.

The study also revealed that experts in the field do not believe that Slovenian companies and other stakeholders can transform their role from a follower to a possible leader of the market. The interviews reveal that Slovenian economy remains technically not strong enough to compete. However, the results also demonstrate that the Slovenian standardization system has not yet reached all its potential. One of the important topics that has yet to be addressed properly is the issue of funding – the government should allocate more resources to support the system which could have a great impact on the national economy.

This study demonstrates that standardization has many benefits and should therefore be more actively promoted by the government and designated stakeholders such as SIST. Stakeholder engagement remains low, but, more importantly, stakeholders do not cooperate among each other. The study reveals that SIST successfully performs only one of its main activities – selling of standards. SIST as a national SDO must engage more actively and provide more ways in which Slovenian companies and other stakeholders can participate on the international level. Currently, only a small number of experts actively participate in the international committees and while SIST has showed no interest in hosting international activities in Slovenia. However, we could do more to identify why SIST remains so ineffective – the problem does not lie in the lack of interest but in the lack of proper governmental support.

In the European and international standardization, Slovenia shares common characteristics with the late-comer countries such as China and Korea. The case of these two countries demonstrates that late-comer countries can transform from the follower to the leader, yet these countries may have to approach standardization strategies differently than market leaders. One of the foremost objectives that such countries must achieve is establishing a clear national standardization strategy. The implementation of a clear standardization strategy would lead to a better unity of institutions and other stakeholders and provide support for new partnerships that might otherwise not even be considered. This could lead to improved technological capabilities of the state. The cases of other late-comer countries stress that late-comer countries have inferior starting capabilities, this, however, can be mitigated by a stronger involvement of the government.

LIMITATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

I have presented the overall standardization system and thus only briefly outlines the topics that deserve a further examination, especially in the Slovenian context where standardization is still a rather unknown topic in academia. Every chapter may be considered as a stand-alone topic of a research study.

One of the more important subjects that has yet to be addressed is the macroeconomic effects of the use of standards in Slovenia. In terms of microeconomic effects of standardization, this I have examined mainly the general attitudes and general understanding of the effects of standardization on a company. Some of the results thus provide limited reliability as the survey indicate that not all survey responders possess the appropriate level of understanding on the topic of standardization. A study with a focus on hard data would be a valuable source of information for all stakeholders.

CONCLUSION

I have examined the Slovenian standardization system and the effects of standardization. The research follows two objectives – I try to gauge the impact of standards on the performance of Slovenian companies and then identify and examine the role and involvement of different Slovenian stakeholders. The empirical part addressed three specific research questions:

1) What kind of impact do standards have on the performance of Slovenian companies?
2) What are the main motives which influence the purchase and use of standards?
3) How engaged are Slovenian companies in the process of standardization?

The study is conducted through the application of three methodological approaches – desk research, preliminary interviews, and survey. A theoretical review of the literature shows that the topic is relatively unexplored while current studies show that standards and standardization offer a wide range of benefits to various aspects of business. The theoretical part also outlines the Slovenian standardization landscape, presents its main stakeholders and their role.

The empirical part of the research is formed on the basis of in-depth interviews conducted with the representatives of different types of stakeholders. These interviews offer an insight into the Slovenian standardization environment and as such are the basis for the design of the survey. The survey was administered exclusively to company representatives and was able to obtain 192 completed answers. The sample is divided into four distinct categories – it consists of 61 representatives of large enterprises, 44 representatives of medium-sized enterprises, 40 representatives of small enterprises and 41 representatives of micro-enterprises.

The key findings of the study confirm the positive effects of standardization on stakeholder cooperation, the positive effects on export opportunities, the positive effects on business competitiveness, and the positive effects on the ability to optimize risk management. The results also confirm that standardization enables the differentiation of products according to the quality of the product or service, which enables companies to improve their brand name through standardization. The results of the survey prove that companies feel the positive effects of standardization regardless of their size. However, there are differences between

companies, as larger companies feel a greater positive effect on certain aspects of standardization than smaller companies do.

The positive effects are especially felt by companies that actively participate in the development process. However, the results also show that the majority of companies still do not understand the role of standardization and are oblivious to the possibilities of their involvement. The study thus confirms that the level of engagement of stakeholders in Slovenia remains very low.

The research confirms the hypotheses that standardization has a positive impact on companies but, based on their size, some companies experience a larger effect of standardization. The research rejects the hypothesis that Slovenian companies decide to buy standards mainly because of legislation. It confirms the hypotheses that Slovenian companies are not sufficiently aware of all aspects and opportunities of standardization, and consequently the participation of companies in the process itself is low. The last hypothesis, which presupposes financial constraints and technical knowledge constraints as the main reason why companies do not get involved in the standardization process, remains unconfirmed.

The study outlines Slovenian standardization system and presents possible future objectives to transform from a follower to a setter of standards. Slovenia needs to establish a clear standardization strategy. The strategy needs to emphasize the importance of cooperation across institutes and other stakeholders and the importance of governmental funding.

REFERENCES

1. APEC Sub Committee on Standards and Conformance. (2010). *Standardization: Fundaments, Impacts, and Business Strategy.* APEC.
2. Baron, J., Contreras, J., Husovec, M., & Larouche, P. (2019). *Making the Rules: The Governance of Standard Development Organizations and their Policies on Intellectual Property Rights.* Luxemburg: Publication Office of the European Union.
3. Blind, K. (2013). *The Impact of Standardization and Standards on Innovation.* Manchester: The University of Manchester.
4. Blind, K., & Drechsler, S. (2017). *European Market Needs for Education in Standardisation/Standardisation-related Competence.* Berlin and Kerlsruhe: European Commission.
5. Blind, K., & Mangelsdorf, A. (2016). Motives to Standardize: Empirical Evidence from Germany. *Technovation 48-49*, 13-24.
6. Blind, K., Jungmittag, A., & Mangelsdorf, A. (2011). *The Economic Benefits of Standardization. An Update of the Study Carried out by DIN in 2000.* Berlin: DIN German Institute for Standardization.
7. Blind, K., Mangelsdorf, A., Niebel, C., & Ramel, F. (2017). Standards in the Global Value Chains of the European Single Market. *Review of International Political Economy 25:1*, 24-48.
8. Blind, K., Petersen, S., & Riillo, C. A. (2017). The Impacts of Standards and Regulation on Innovation in Uncertain Markets. *Research Policy 46*, 249-264.
9. Cebr. (2015). *The Economic Contribution of Standards to the UK Economy.* London: BSI.

10. Choung, J.-Y., Hameed, T., & Ji, I. (2011). Role of Formal Standards in Transition to the Technology Frontier: Korean ICT System. *Telecommunications Policy 35*, 269-287.

11. Dupendant, J. (2016). *International Regulatory Co-operation and International Organisations: The Case of the International Organization for Standardization (ISO).* OECD.

12. Ernst & Young. (2015). *Independent Review of the European Standardisation System.* Brussels: European Commission.

13. Ernst, D., Lee, H., & Kwak, J. (2014). Standards, Innovation, and Latecomer Economic Development: Conceptual Issues and Policy Challenges. *Telecommunications Policy 38*, 853-862.

14. European Commission. (2016). *Joint Initiative on Standardisation under the Single Market Strategy*. Retrieved March 21, 2021 from https://ec.europa.eu/growth/content/joint-initiative-standardisation-responding-changing-marketplace_en

15. European Commission. (2019). *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. The Annual Union Work Programme for European Standardisation for 2020.* Brussels: European Commission. Retrieved March 21, 2021 from https://www.europarl.europa.eu/resources/library/media/20200205RES71935/20200205RES71935.pdf.

16. Featherston, C. R., Ho, J.-Y., Brevignon-Dodin, L., & O'Sullivan, E. (2016). Mediating and Catalysing Innovation: A Framework for Anticipating the Standardisation Needs of Emerging Technologies. *Technovation 48-49*, 25-40.

17. Gao, P., Yu, J., & Lyytinen, K. (2014). Government in Standardization in the Catching-up Context: Case of China's Mobile System. *Telecommunications Policy 38*, 200-209.

18. GHK & Tehnopolis Group. (2009). *Evaluation of the EU Actions for the Promotion of Craft and SMEs' Interests in the European Standardisation Area.* European Commission.

19. ISO. (2014). *Economic Benefits of Standards.* Geneva: ISO.

20. Mazzucato, M. (2018). *The Value of Everything: Making and Taking in the Global Economy.* London: Penguin.

21. Močnik, D., Duh, M., & Crnogaj, K. (2018). *Slovenska podjetniška demografija in prenos podjetij.* Maribor: Univerzitetna založba Univerze v Mariboru.

22. Russell, A. L. (2007). The American System: A Schumpeterian History of Standardization. *Progress & Freedom Foundation Progress on Point Paper No. 14.4*.

23. Scapolo, F. Churchill, P., Viaud, V., Antal, M., Cordova Gonzalez, Castillo, H. L., & De Smedt, P. (2014). *How will Standards Facilitate New Production Systems in the Context of EU Innovation and Competitiveness in 2025?* Brussel: European Commission.

24. Shin, D.-H., Kin, H., & Hwang, J. (2015). Standardization Revisited: A Critical Literature Review on Standards and Innovation. *Computer Standards and Interfaces 38*, 152-157.

25. SIST. (2005, October 26). *Navodilo o sprejemanju standardov.* Retrieved June 6, 2020 from SIST: http://www.sist.si/navodilo-o-sprejemanju-standardov.html.

26. Slovenian Institute for Standardization. (2019). *2018 annual report of Slovenian Institute for Standardization.* Retrieved June 14, 2020 from https://www.ajpes.si/podjetje/SLOVENSKI_INSTITUT_ZA_STANDARDIZACIJO?enota=268118&EnotaStatus=1&zavihek=1&ivs=20&ivn=1&kons=0.

27. Slovenian Institute for Standardization. (2020). *2019 annual reportof the Slovenian Institue for Standardization*. Retrieved June 14, 2020 from https://www.ajpes.si/podjetje/SLOVENSKI_INSTITUT_ZA_STANDARDIZACIJO?enota=268118&EnotaStatus=1&zavihek=1&ivs=20&ivn=1&kons=0.

28. Swann, G. M. (2010). *The Economics of Standardization: An Update.* Innovative Economics Limited.

29. Šooš, T. (2017). *Strategija razvoja Slovenije 2030.* Ljubljana: Služba Vlade Republike Slovenije za razvoj in evropsko kohezijsko politiko.

30. Technopolis Group. (2012). *Using Standard to Support Growth, Competitiveness and Innovation. Guidebook Series.* European Commission.

31. Topfer, A., Blum, U., Eickhoff, G., Junginger, I., Blind, K., Grupp, H., Hullman, A., & Jungmittag, A. (2000). *Economic Benefits of Standardization. Summary of Results. Final Report and Practical Examples - Part A: Benefits for Businesses - Part B: Benefits for the Economy as a Whole.* DIN German Institute for Standardization e. V.

32. Totus. (2002). *Study into the Impact of Standardization. Final Report to DG Enterprise.* Bray: ISUG.

33. Vollebergh, H. R., & van der Werf, E. (2014). The Role of Standards in Eco-innovation: Lessons for Policymakers. *Review of Environemnetal Economics and Policy, Vol. 8, Issue 2*, 230-248.

34. Zi, A., & Blind, K. (2014). Researchers' Participation in Standardisation: A Case Study from a Public Research Institute in Germany. *J Technol Transf*.

35. Zoo, H., de Vries, H. J., & Lee, H. (2017). Interplay of Innovation and Standardization: Exploring the Relevance in Developing Countries. *Technological Forecasting and Social Change 118*, 334-348.

APPENDICES

Appendix 1: Summary

Ta magistrska naloga preučuje slovenski sistem standardizacije in njene učinke. Raziskava sledi dvema ciljema – poskuša oceniti vpliv standardov na uspešnost slovenskih podjetij ter nato opredeliti in preučiti vlogo in vključenost različnih slovenskih deležnikov. Raziskavo vodijo tri raziskovalna vprašanja: (1) Kakšen vpliv imajo standardi na dejavnost podjetij; (2) Kateri so glavni motivi, ki spodbudijo nakup in uporaba standardov; (3) Kakšna je raven vključenosti slovenskih podjetij v procesu standardizacije.

Raziskava je metodološko osnovana na treh pristopih – pregledu literature, globinskih intervjujih in anketi. Teoretični pregled literature pokaže, da je tematika dokaj neraziskana, že opravljene raziskave pa dokazujejo, da imajo standardi pozitivno vlogo na različne vidike poslovanja – od inovacij do komunikacije v verigi vrednosti. Predstavljeni so glavni izsledki teh raziskav, obenem pa je predstavljeno tudi stališče Evropske komisije do te tematike. Na podlagi različnih virov je analizirano tudi slovensko okolje standardizacije, opisan sam proces, predstavljeni glavni deležniki in njihova vloga.

Empirični del raziskave je nato oblikovan na podlagi globinskih intervjujev s predstavniki različnih tipov deležnikov. Ti intervjuji služijo kot podlaga za uvid v slovensko standardizacijsko okolje in so kot taki podlaga za oblikovanje ankete, ki bo čimbolj zajela vsa slovenska podjetja, ne glede na velikost in potrebe. Poglavitni del empiričnega dela je analiza ankete, ki je namenjena izključno predstavnikom podjetij. V anketi je zajet vzorec 192 popolnih odgovorov, ki se za namene statistične obdelave deli na skupine glede na velikost podjetja. Vzorec je tako sestavljen iz 61 predstavnikov velikih podjetij, 44 predstavnikov srednje velikih podjetij, 40 predstavnikov malih podjetij in 41 predstavnikov mikro podjetij.

Ključne ugotovitve študije potrjujejo pozitivne učinke standardizacije na sodelovanje med deležniki, pozitivne učinke na izvozne možnosti, pozitivne učinke na konkurenčnost podjetij in pozitivne učinke na sposobnost optimizacije obvladovanja tveganj. Rezultati potrjujejo tudi, da standardizacija omogoča razlikovanje proizvodov glede na kakovost produkta oziroma storitve, kar omogoča, da podjetja s standardizacijo vplivajo tudi na dobro ime podjetja. Rezultati ankete dokazujejo, da podjetja občutijo pozitivne učinke standardizacije ne glede na njihovo velikost. Vseeno pa so razlike med podjetji, saj večja podjetja na določenih vidikih standardizacije občutijo večji pozitivni učinek kot manjša podjetja.

Rezultati raziskave dokazujejo tudi, da je slovenska vključenost deležnikov nizka. Ti se trenutno še ne zavedajo prednosti aktivne udeležbe in slabo poznajo možnosti za večjo vključitev. Podjetja, ki aktivno sodelujejo v samem procesu, večinoma navajajo, da ima aktivna vključitev pozitivni vpliv predvsem na širjenje znanj in tehnologije, kot tudi širjenje informacij glede prihodnjih omejitev na trgu.

Raziskava potrdi hipotezi, da ima standardizacija pozitiven vpliv na podjetja, vendar ne enako velik vpliv na podjetja glede na njihovo velikost. Raziskava zavrne hipotezo, da se slovenska podjetja za nakup standardov odločajo predvsem zaradi zakonodaje. Raziskava enako potrdi hipotezi, da slovenska podjetja niso dovolj ozaveščena o vseh vidikih in priložnostih standardizacije in je s tem posledično tudi udeležba podjetij v samem procesu nizka. Zadnja hipoteza, ki kot glavni razlog zakaj se podjetja ne vključujejo v proces standardizacije navaja finančne omejitve in omejitve v tehničnem znanju, ostaja nepotrjena.

Appendix 2: Preliminary Interviews

Preliminary interview 1

OBRAZEC: GLOBINSKI INTERVJU
KRAJ IN DATUM: 9. september, 2019 ČAS TRAJANJA INTERVJUJA: 1h 30 min
DELO V POVEZAVI S STANDARDIZACIJO: V preteklosti direktor SZKO.
KLASIFIKACIJA STANDARDOV Standarde ločuje po različnih kriterijih. Prva delitev: 1.priporočilni = smernice (EFQM) 2.obvezujoči = minimalna raven poslovanja (ISO 9001) (v resnici 9001 in EFQM zelo podobna. 9001 postavi prag; EFQM je vse kar je nad) Druga delitev: 1.mednarodni (ISO) 2.industrijski Tretja delitev: 1.klasifikacija glede na trg: nemški, azijski, ameriški, mednarodni, itd.
UPORABA STANDARDOV V SLOVENSKIH PODJETJIH Velikost podjetja ni toliko pomembna pri nakupu standarda – velika podjetja si lažje privoščijo, majhna ne morejo brez. Stroški nakupa in implementacije so majhni glede na dodano vrednost. Standardizacija ni odvisna od stopnje podjetja v verigi – veriga mora biti sklenjena.
SODELOVANJE PRI OBLIKOVANJU STANDARDOV V preteklosti se je razmišljalo, da bi standardizirali SLO zdravstvo, DJU – državna javna uprava (poslovna odličnost). Ampak potem so nastali pomisleki, ali je to res dobra praksa ali samo naše mnenje. Standardi se razvijajo za to, da se omogoča boljše sodelovanje. SLO ne sme postati otok. Standard definira nekaj, da si drugačen – zgled. Pri tem se rabi kritična masa deležnikov za standardizacijo v SLO. V SLO ni velikega potenciala, ker ni dovolj kritične mase. Potencial vidi v: Bitcoin borzi; genetski inženiring. Da samo eno podjetje oblikuje nov standard, je nesmiselno; mora biti skupek več podjetij – združenje. Odločitev podjetja: lahko standardiziraš ali patentiraš. S standardizacijo na novem področju postaviš smernice; s patentom zaščitiš svoje intelektualno delo.
PRILOŽNOST ZA SIST Prispevek države pri financiranju SIST-a bi moral biti večji. SIST bi moral biti bolj proaktiven pri marketingu podjetjem - osveščanje o standardih. Sodelovanje med zaščito s patenti in SIST-om bi bilo dobro.
MNENJE O SISTU IN STANDARDIZACIJI SIST-ov rezultat je input za SIQ, BV,… Svetovalci in združenja dajejo informacije o standardih. Standard je lahko napredek, lahko pa tudi cokla (če ostajaš na istem standardu več let brez posodobitve). Učinki uporabe standardov pri delovanju podjetja: lažje se ve, kaj se kupuje, podjetja kupujejo izdelke, ki so pod standardom – kompatibilnost z drugimi. Standard nujen tudi zato, da kupci vedo, kaj kupujejo. Če podjetje ne standardizira, ne bo mogel prodati. SIST potrebujemo za razvijanje jezika Ampak ali je standardizacija zavoljo kompatibilnosti dobra ali slaba? Lahka izdelava ponaredkov. Ko nekaj standardiziraš, so lastnosti produkta/storitve znane. Za uspeh na trgu potem potrebuješ nekaj, kar znaš samo ti. Če država zahteva, da se dela po SIST-u, zakaj je treba plačevati? Podjetja poznajo SIST? Če samo ena oseba v podjetju pozna SIST, potem podjetje pozna SIST.

Preliminary interview 2

OBRAZEC: GLOBINSKI INTERVJU
KRAJ IN DATUM: 16. september, 2019 ČAS TRAJANJA INTERVJUJA: 1h 30 min
DELO V POVEZAVI S STANDARDIZACIJO: v preteklosti zaposlen v Bureau Veritas kot regionalni direktor za vzhodno Evropo.

KLASIFIKACIJA STANDARDOV Standarde deli glede na namen na področja: management, tehnično področje, okolje, industrija, potrošniški izdelki, mednarodna trgovina.
UPORABA STANDARDOV V SLOVENSKIH PODJETJIH Podjetja vstopijo v t.i. verigo certificiranja že pred samo pripravo produkta. Med izdelavo produkta potem sledijo tej verigi, saj z njimi sodelujejo že dlje čas. Prav tako verige ne zapustijo, saj vedo, da bodo s sledenjem priporočil organizacij potem na koncu res dobili certifikat ustreznosti brez zapletov. Vsako podjetje ima določene KPI-je za področje standardov: sledijo številu standardov, stroškom standardov. 20 let se je morda še dalo slediti temu, kakšna je razlika v uspehu podjetja s standardom oziroma tega brez. Danes je to že nemogoče, saj brez standardov podjetje sploh ne more delovati. Podjetje ima sklenjeno pogodbo z ocenjevalci za tri leta, te pogodbe se redno podaljšuje. Uvedbi novega standarda sledi pregled. Dodatni nadzor je opravljen na šest mesecev.
SODELOVANJE PRI OBLIKOVANJU STANDARDOV Slovenija je odločno premajhen trg, da bi se ji splačalo postavljanje svojih smernic. Meni, da med standardizacijo in patentom ni povezave. Najprej patentiraš, potem standardiziraš.
PRILOŽNOST ZA SIST Meni, da je trg zasičen, organizacije za certifikacijo že pokrivajo vsa področja in redno posodabljajo svojo ponudbo. Tudi področje za trajnostni razvoj je po njegovem mnenju že pokrit. Zdi se mu nemogoče, da bi SIST na katerem področju bil hitrejši. SIST mora predvsem delati na marketingu in prodaji, če želi konkurirati. Predlaga, da se SIST osredotoči na izboljšanje ponudbe, ki jo že ima: izobraževanja in seminarji - osvežena ponudba, odstopanje od trenutne ponudbe na trgu. SIST naj začne pri članih, ki že plačujejo letno članarino in zanje gradi na ponudbi seminarjev/delavnic/izobraževanj, ki naj bodo bolj redna. Organizacija dogodkov s katerimi privabijo pozornost vseh deležnikov na tem področju. Posledično sodelovanje z raznimi inštituti, ki so trenutno naslov za pridobivanje tehnično specifičnih standardov. Podjetja, ki izbirajo druge ponudnike za prodajo in vpeljevanje standardov, morajo prepričati, da izstopijo iz procesa in koristijo izobraževanje tudi od SIST-a. Naj se osredotočijo na lokalni trg, za mednarodno konkurenčnost ni pogojev.
MNENJE O SISTU IN STANDARDIZACIJI Nikoli sicer ni sodeloval s SIST-om, vendar, kot opaža, ima dve glavni področji: prevajanje in adaptacija standardov za slovenski trg in njihova prodaja ter komercialno področje trženja izobraževanj. Oblikovanje novih standardov ni smiselno za državno organizacijo kot je SIST. SIST vidi predvsem le kot nek nacionalni organ, ki obstaja le zavoljo jezika in za to, da Slovenija ostane na tekočem na področju standardizacije. Ocenjevalne organizacije so vpete v proces standardizacije že od začetka oblikovanja novega produkta, medtem ko SIST pomaga le proti koncu. Prevedeni standardi prihajajo z zamudo, zato jih podjetja velikokrat prehitijo in standard že vpeljejo pred izdajo slovenske verzije. Standarde kupijo preko ISO-ja. Ocenjevalci so že preveč vpeti v verigo, da bi jih SIST lahko nadomestil. Prav tako ima SIST premalo zaposlenih za pravo pomoč, prav tako pa premalo zaposlenih strokovnjakov, ki bi lahko podpirali sam razvoj standarda (tehnični strokovnjaki). SIQ ima na primer svoj laboratorij.

Preliminary interview 3

OBRAZEC: GLOBINSKI INTERVJU
KRAJ IN DATUM: 18. september, 2019 ČAS TRAJANJA INTERVJUJA: 1h
ZAPOSLITEV: SIQ
UPORABA STANDARDOV V SLOVENSKIH PODJETJIH SIQ ni vključen v samo odločitev kdaj in kje podjetja kupujejo standarde, SIQ se vključi kasneje, v fazi preverjanja. Ne ve, kje podjetja v resnici kupujejo standarde.
SODELOVANJE PRI OBLIKOVANJU STANDARDOV Priložnosti za Slovenijo pri oblikovanju svojih lastnih standardov ne vidi. V Sloveniji ne obstaja industrije, ki bi bila le lokalna. Oblikovanje lastnih standardov si lahko privoščijo le bogate države.
PRILOŽNOST ZA SIST SIQ vidi možnosti v projektnem sodelovanju med SIST in SIQ. Zanašati se morajo na svoje člane - torej morajo delati na povečanju članstva in jim ponuditi dodano vrednost. DIGITALIZACIJA: Izboljšana in poenostavljena uporabniška izkušnja pri nakupovanju, pregledovanju, pridobivanju in vpogledu v standarde preko spletne aplikacije.

Pri tem vidi možnost tudi za internacionalizacijo - s hitrejšo, bolj dovršeno in inovativnejšo spletno stranjo bi SIST lahko ciljal na tuje trge. Vendar pa ponudbe izven "distribuiranja" in ozaveščanja domačega okolja ne bi širil na izobraževanja in seminarje. Poudarja pomembnost zavedanja države, da lahko boljša vključenost strokovnih odborov v mednarodne sfere, pomeni boljši prenos in dostop do informacij in s tem večjo konkurenčnost slovenskih podjetji. Bistvenega potenciala za širjenje na nova področja ne vidi, so tudi ostale organizacije dokaj ažurne. Interes za nova področja mora priti od članov. Tehnični odbori bi morali biti aktivnejši, delovati kot motivatorji. Kar pogreša pri SIST-u je obvestilo o novi izdaji.
MNENJE O SISTU IN STANDARDIZACIJI SIST sogovornik vidi kot pomemben državni organ, ki podpira druge s tem, da omogoča poenostavljen dostop do standardov vsem uporabnikom in omogoča dostop do informacij preko tehničnih odborov. Glavno vodilo SIST-a mora biti dvig tehnične kulture. Prava tehnična izobraževanja SIST ne more nuditi, ker nima dovolj tehnično usposobljenega kadra. SIQ kupuje standarde preko estonske posredovalnice. Tja jih je napotil nemški laboratorij. Na estonsko posredovalnico se ne obračajo zaradi cene, temveč zaradi uporabniške izkušnje. Estonska stran EESTI je uporabniku bolj prijazna, enostavna za uporabo. Stran omogoča lahek nakup preko spleta, 24 urni vpogled v standard za simbolno ceno, licenčno verzijo za več uporabnikov. Obenem estonska stran ponuja ameriške standarde, ki jih v Sloveniji ni moč dobiti. Če bi SIST postal bolj uporabniško prijazen in dostopen, bi SIQ tudi verjetno začel kupovati pri SIST-u. SIST vidi kot povezovalni organ, ki pa mu primanjkuje prave promocije in državnih sredstev. Vložek v SIST se mu zdi mali strošek proti temu, kar takšen dobro podprt organ lahko naredi za celotno gospodarstvo. Za primerjavo postavi promocijske centre za turizem. Če bi država vzpostavila takšen promocijski center tudi za SIST, bi s tem omogočala pravi razvoj.

Preliminary interview 4

OBRAZEC: GLOBINSKI INTERVJU
KRAJ IN DATUM: 19. september, 2019 ČAS TRAJANJA INTERVJUJA: 1h 45 min
DELO V POVEZAVI S STANDARDIZACIJO: član SIST-a, zastopnik Slovenije v ITU (vice chairman), predstavnik strokovnega sveta SIST, uporabnik (Iskratel, Nicelabel, Cosylab)
SODELOVANJE PRI OBLIKOVANJU STANDARDOV Slovenija in Evropa še nista dovolj napredni v svetovnem merilu. Ključno je, da se standard oblikuje v naprej, še predno tehnologija postane izpopolnjena. V slovenskih podjetjih je problem, da želijo prepočasi pristopiti k standardizaciji; šele ko je tehnologija že povsem izoblikovana, vendar so takrat že za okoli deset let prepozni. Oblikovanje novih standardov ima zelo ozko odprto okno, ko se standard v resnici lahko oblikuje, preden te tekmeci prehitijo. Slovenska podjetja se za standardizacijo odločajo prepozno, čeprav je interes. Slovenska podjetja imajo težave s svojimi deležniki. Mora biti dovolj velik interes celotne industrije, saj se mora združiti in uskladiti tri do pet podjetij. Slovenska industrija ne premore toliko močnih podjetij v posamezni industriji. Pri standardizaciji delaš globalni trg, ne le iščeš tržno nišo. Pri patentih ljudje vedno spremljajo, kateri patent bo potekel. Enako se lahko učiš s standardi, lahko opazuješ, kaj se dogaja in potem veš, kaj se pripravlja. V Sloveniji se preveč oziramo na velike zneske; ni treba, da ti standardizacija prinese 20 milijonov eurov, dovolj je, če prinese 1 milijon. V Sloveniji podjetja želijo le koristi od tega, da oblikujejo nov standard. Ko pride pogovor na stroške, pa se vsi umaknejo. Podjetja bi morali ozaveščati o trajnostnemu razvoju. Podjetja se preveč ozirajo na kratkotrajni razvoj, zato ne sodelujejo pri oblikovanju novih standardov, saj v tem ne vidijo potenciala. Nekateri standardi so oblikovani de facto – podjetje je tako veliko, da postavlja smernice brez, da bi v resnici oblikovali nov standard. Razlog, zakaj podjetja ne pregledujejo osnutkov in ne dajejo pripomb, je tudi ta, da so slovenska podjetja prevečkrat površinska, povprečna in površna.

PRILOŽNOST ZA SIST Na Kitajskem je izobraževanje o avtorskem pravu in standardizaciji del predmetnika. V tujini je tudi praksa uporaba mlajših upokojencev za strokovnjake, ki zastopajo državo na mednarodnem poligonu. SIST se obnaša kot v starih časih, ko je bil trg razdrobljen na posamezne države. Sedaj pa imamo prost pretok blaga in storitev, zato vsi kupujejo v Estoniji, ker so cene tudi 10x nižje. Tudi hitrejša uporaba, pri nas pa čakaš en ali dva dni na standard. Tudi knjižnica je samo v Ljubljani. SIST bi moral imeti samo dvokolonske standarde (samo en standard za oba jezika). SIST bi moral stopiti v dogovor z državo. Država bi odkupila pravice z standarde iz vseh mednarodnih organizacij, to bi jo stalo le okoli 250 000 eur. Podjetja, ki so registrirana v Sloveniji, bi tako standarde lahko uporabljala zastonj, tuji državljani pa bi morali plačati. Morda bi tako tudi mednarodna prodaja iz SIST-a postala bolj konkurenčna. SIST bi moral ustvariti povezavo s podjetji, ki imajo svoj lasten R&D oddelek. Tem oddelkom bi SIST moral nuditi pomoč. SIST bi moral sodelovati v industrijskih forumih. SIST bi se moral posvetiti jeziku, generirati terminologijo in jo preko svojega sistema ponujati kupcem. SIST bi moral bolj proaktivno pristopiti na mednarodnem trgu. Slovenija bi lahko gostila dva do tri sekretariate, pa očitno sploh nima želje, da bi se potegovala zanj. SIST bi moral dati možnost nekih simbolnih zneskov za vpogled. Inštitut bi moral vzpostaviti vlogo glavnega informacijskega vozlišča, sedaj pa zaračuna vsako informacijo zase. Informacije je treba zaračunati tam, kjer je vrednost, ne vsake posebej.
MNENJE O SISTU IN STANDARDIZACIJI SIST bi moral predvsem slediti temu, da postane informacijsko vozlišče. Pomembno je, da SIST vključi vse deležnike in jih poveže in postavi z globalni trg. Ti deležniki so potrošniki, akademska sfera, država, industrija. Žal država financira le zaposlene, zato za prave SIST-ove projekte ni denarja. Tudi v industriji je premalo denarja za proaktivnost podjetij. V tujini podjetja redno pošiljajo svoje strokovnjake na izobraževanja in v druga podjetja, pri nas podjetja nimajo takega denarja. Tudi akademska sfera nima pravega denarja. V preteklosti, ko je bil trg razdrobljen, so države še lahko varovala svojo ekonomijo. Danes je trg globalen in de facto standardi so pogosti. Ministrstvo in javnost gleda na SIST kot na strošek. SIST zato ni več sposoben plačati strokovnih potovanj svojih članov. Člani bi morali bolj pogosto zastopati Slovenijo v mednarodnih krogih. Zakonodaja je oklestila SIST za bogate vire dohodkov, ko je prepovedala certificiranje in izdajo standardov v enem organu. Irska je dobra praksa. Moralo bi se delati na tem, da se v ministrstvu spremeni mnenje, da ne gledajo na SIST le kot na strošek, temveč kot na vir za trajnostni razvoj. SIST-ova standardoteka je dobro urejena. Tehnični odbori, sekretarji so izredno slabi. Sogovorniku se ne zdi prav, da se določena področja enostavno izpušča. Morali bi pokrivati vsa področja, saj je to SIST-ova dolžnost do državljana. Če ne spremljamo vseh področij, lahko nastanejo težave in stroški. Promocija standardizacije je izredno slaba. Še posebno je slabo sodelovanje z GZS. GZS je treba prepričati v to, da standardizacija znižuje stroške (neposredno prispeva 0,5% k BDPju, neposredno pa kar 4%). SIST bi moral biti hitrejši, moral bi biti takoj zraven novih področij, kjer se oblikuje nova tehnologija, pa vedno zamuja. Pametna specializacija je strategija v Nemčiji že zadnjih deset let. Slovenija bi morala biti prva na področju digitalizacije, če ne, bomo izgubili status dobrega mednarodnega dobavitelja. Rak rana SIST-a je njegov informacijski sistem. Sistem je povsem neustrezen za sodobne sisteme in uporabnike. Da bi Slovenija sama razvijala dober sistem, ni denarja. SIST bi se, kot Avstrijci, pripeti na IEC sistem. Tako bi gostovali v njihovem sistemu in dodajali tudi svoje standarde, storitve.

Preliminary interview 5

OBRAZEC: GLOBINSKI INTERVJU
KRAJ IN DATUM: 20. september, 2019 ČAS TRAJANJA INTERVJUJA: 45 min
DELO V POVEZAVI S STANDARDIZACIJO: član SIST-a, predsednik evropskega komiteja za varnost gospodarskih podatkov (CENELEC), uporabnik, nemški in slovenski ekspert

UPORABA STANDARDOV V SLOVENSKIH PODJETJIH Standarde kupuje Bosch, zbrani so v sistemu norma master, do katerega ima BSH Nazarje prost dostop. V SIST-u tako ne kupujejo standardov, ker jih avtomatično dobijo preko matične družbe. Pred norma master so bili del Noris sistema (Siemens), ki ima okoli 1,5milijonov standardov. Norma master jih ima okoli 3 do 4 tisoč. Le redko sami kupujejo standarde.
SODELOVANJE PRI OBLIKOVANJU STANDARDOV Da bi slovenska podjetja oblikovala svoje standard, je pobožna želja. Za kaj takega potrebuješ podjetja, ki so popolnoma na konici razvoja. Morda je možnost v kripto valutah in Pipistrel podjetju. Na svetu so za področje na katerem deluje BSH Nazarje le tri podjetja sposobna tudi ustvarjati lastne standarde. Standarde se vedno piše za nazaj, ko je podjetje že razvilo tehnologijo. Načeloma podjetja niso pristaš standardizaciji, saj se, zaradi usklajevanja, njihove posebne lastnost in sposobnosti krčijo. Standardizacije je orodje, ki omogoča konkurenčnost, saj se z uskladitvijo nižajo stroški. Ko velika podjetja postavljajo nove standarde, s tem onemogočajo mala podjetja, saj morajo ta slediti, čeprav morda nimajo vseh virov za to. Enaka situacija nastane, ko govorimo o dajanju pripomb na osnutke novih standardov – velika podjetja pri tem imajo interes, saj bodo za njih neugodni predpisi večali stroške. Če je podjetje malo, nima niti finančnih virov, da bi procesu sledil, niti pravega tehničnega znanja, da bi podjetje lahko sledilo. Prav tako so slovenska podjetja večinoma dobavitelj tujim podjetjem; zaradi tega nimajo interesa sledenju standardizaciji, saj jim predpise postavlja kupec. Iluzorno je pričakovati, da bi SIST generiral nove standarde. Za nov standard potrebuješ popolnoma nove tehnologije.
MNENJE O SISTU IN STANDARDIZACIJI Podjetje je član SIST-a zato, da lahko sodeluje v komitejih. SIST jim omogoča dostop do mednarodnega okolja. Podjetje na SIST kupuje standarde le, ko je nujno, da je standard slovenskega jezika. To je nujno, če je vključena velika skupina ljudi. Za večino uporabnikov je sicer dovolj angleška verzija, oziroma celo nujna za sodelovanje na mednarodnem trgu. Podjetje od SIST-a pričakuje podporo pri vključevanju v mednarodne tehnične komiteje. V Sloveniji je žal premalo pravih ekspertov, ki bi lahko sodelovali v mednarodnih komitejih. SIST-ova podpora je izredno slaba, kar se kaže tudi pri odsotnosti interesa, da bi v Sloveniji bolje sprejeli mednarodne goste iz mednarodnih organizacij za standardizacijo. Enako se kaže slaba podpora SIST-a pri registracijah na različne mednarodne konference. Podjetje od SIST-a pričakuje tudi večjo agilnost pri malih stvareh, ki niti ne potrebujejo veliko finančnega vložka. SIST-ovo vlogo podjetje vidi kot servis, zato bi se moral obnašati kot servis. SIST ne more biti gonilna sila novih inovacij, saj nima dovolj virov za pomoč. SIST bi moral omogočati pretok informacij. SIST-ova standardoteka je dobra. Enako je SIST-ov spletni sistem zelo podoben ostalim mednarodni organizacijam.

Preliminary interview 6

OBRAZEC: GLOBINSKI INTERVJU
KRAJ IN DATUM: 24.9.2019 ČAS TRAJANJA INTERVJUJA: 45 min
DELO V POVEZAVI S STANDARDIZACIJO: Sogovorec je s SIST-om povezan kot član strokovnega odbora, zato redno sodeluje pri dopisnih sejah in potrjevanju, pregledovanj in sprejemanju novih standardov ali sprememb le-teh. Enkrat letno imajo srečanje.
UPORABA STANDARDOV V SLOVENSKIH PODJETJIH Večino standardov kupijo preko SIST-a, saj kot člani dobijo popust. V primeru, ko določenega standarda SIST nima v ponudbi se obrnejo direktno na evropske ali mednarodne organizacije za standardizacijo, ki je standard izdala ali pa na tuje nacionalne urade za standardizacijo. Kar se tiče testiranja, testirajo veliko sami, ostalo pri SIQ in tudi v tujini. Po njegovem to področje niti ni naloga SIST-a niti se jim ne bi splačalo ukvarjati s tem.
SODELOVANJE PRI OBLIKOVANJU STANDARDOV /
PRILOŽNOST ZA SIST Predvsem v prevodih pravi, da mnogokrat pride do tega, da so zastareli in lahko pride do zmede. Bolje bi morali slediti spremembam in jih upoštevati, ne le prevesti prvo verzijo.

Bolje bi morali promovirati svojo korist za podjetja, saj bi tako več slovenskih strokovnjakov sodelovalo v mednarodnem okolju in tako približali mednarodne informacije slovenskim podjetjem.
MNENJE O SISTU IN STANDARDIZACIJI Vedno so pripravljeni na še več izobraževanj. Meni, da je izjemnega pomena izobraževanje vodstev podjetji, ki bi tako lahko spoznale vrednost obiskovanja mednarodnih strokovnih zborovanj na področjih, kjer njihovi zaposleni delujejo. Pomembno je torej splošno zavedanje in znanje o pomembnosti standardov ter zavedanje, da neposredna udeleženost pri oblikovanju standardov lahko prinese pomembno konkurenčno prednost podjetju v določeni panogi.

Preliminary interview 7

OBRAZEC: GLOBINSKI INTERVJU
KRAJ IN DATUM: 24.9.2019 ČAS TRAJANJA INTERVJUJA: 30 min
DELO V POVEZAVI S STANDARDIZACIJO: Član strokovnega odbora preko SIST-a za ISO/TC 176
KLASIFIKACIJA STANDARDOV /
UPORABA STANDARDOV V SLOVENSKIH PODJETJIH /
SODELOVANJE PRI OBLIKOVANJU STANDARDOV /
PRILOŽNOST ZA SIST Predlaga finančno podporo in večjo promocijo ter motiviranje strokovnjakov za udejstvovanje v odborih in mednarodnih srečanjih. SIST-u bi predlagal bolj aktivno usposabljanje svojih članov. Preko informiranja in ozaveščanja s predavanji/seminarji/delavnicami narediti boljši stik s člani. Naj ne bodo le posrednik pri suhoparni predaji standarda. Predlaga naj najprej oblikujejo informativna izobraževanja s čimer bi podučili slovenski trg o pomembnosti standardov in ažurnosti strokovnjakov na tem področju. Nato pa naj po ponudijo še formalna, plačljiva izobraževanja. Priložnost pri prevajanju vidi tudi pri oblikovanju enotne strokovne terminologije, ki bi jo potem uporabljali vsi prevajalci. Neke vrste pojmovnik za izraze na področju standardizacije in tudi bolj specifični prevodi za tehnična področja. Na vprašanje glede povezovanja z GZS se strinja, da je to lahko ena izmed možnosti za boljše povezovanje znotraj slovenskega območja.
MNENJE O SISTU IN STANDARDIZACIJI /

Preliminary interview 8

OBRAZEC: GLOBINSKI INTERVJU
KRAJ IN DATUM: 25. september 2019 ČAS TRAJANJA INTERVJUJA: 45 min
DELO V POVEZAVI S STANDARDIZACIJO: Po nekaj letih dela v razvoju je prevzel delo s standardizacijo na področju varovalk in od leta 2000 deluje kot član delavnih skupin v SIST in tehničnega odbora v IEC za pripravo novih ali posodobitev standardov za varovalke. Predsednik Tehničnega komiteja 32 v IEC.
KLASIFIKACIJA STANDARDOV /
UPORABA STANDARDOV V SLOVENSKIH PODJETJIH V podjetju je oseba, ki se ukvarja z nakupom standardov. Kupljen standard natisnejo in ga imajo v arhivu, dostopnem zaposlenim. Standarde, ki jih ima SIST, kupijo preko njih, druge (npr. UVE) tudi preko drugih institucij. Pri nakupu standardov razvojnik ne gleda veliko na ceno, če ga potrebuje ta trenutek (takoj). Tudi na jezik ne.
SODELOVANJE PRI OBLIKOVANJU STANDARDOV Sodeluje znotraj tehničnega odbora

Sodelovanje pri oblikovanju vidi kot priložnost, za podjetja, saj lahko strokovnjaki s sodelovanjem pri oblikovanju v podjetje prinesejo novo tehnologijo, ki ustreza standardom, ki bodo šele izšli (se pravi so že pred uradnim izidom standarda pripravljeni na to, kar prihaja → konkurenčna prednost). Panoge s potencialom: baterijski sistemi, polnilnice; avtomobilsko področje (sestavni deli za avtomobila).
PRILOŽNOST ZA SIST Oblikovanje skupine znotraj SIST-a na področju sestavnih delov za avtomobile, da se potem ti strokovnjaki vključujejo v delo IEC. SIST bi lahko doprinesel tudi h kapacitetam za testiranja, kar bi bila ogromna prednost za slovenska podjetja (ideja: termoelektrarna v Zasavju (Trbovlje), ki bi jo lahko preuredili v testni laboratorij za homologirano testiranje).
MNENJE O SISTU IN STANDARDIZACIJI Sodelovanje s SIST-om je prvi korak pri vključevanju v oblikovanje standardov na mednarodni ravni. Slovenski strokovnjaki se srečujejo v sklopu SIST-a, SIST pa nominira enega v mednarodne institute npr. IEC. Kot predsednik tehničnega komiteja v IEC je neprestano v kontaktu s SIST-om in odgovorno tehnično sekretarko odbora EVA. Sodelovanje opiše kot zelo dobro, predvsem po administrativni plati (npr. omogočanje glasovanja znotraj sistema). Zadovoljen je s podporo SIST-a glede dela v IEC. SIST dela dobro, lahko pa bi se bolje promoviral, da bi bila vsa proizvodna industrija vključena. Iz izkušenj ETI-ja je pomembno, da vodstvo razume pomen sodelovanja pri oblikovanju standardov. SIST/Direktorica bi lahko proaktivno pristopila do vodstva in predstavila pomen in doprinos takšnega sodelovanja za podjetje (tako kot je to bilo storjeno v primeru ETIja). Prav zaradi tega razumevanja podjetje samo spodbuja sodelovanje pri oblikovanju standardov in je pripravljeno kriti stroške participacije, saj SIST sodelovanja finančno ne podpira oz. ne more podpreti. V tujini del finančne podpore strokovnjakom, ki sodelujejo pri oblikovanju standardov na mednarodni ravni, prihaja tudi s strani institucij kakršna je SIST. To je problem za mala podjetja. SIST bi se moral povezati z GZS, ki bi vse zainteresirane preusmerila na SIST, ki bi bil kontaktna točka za standarde in bi posredovala vse potrebne informacije. V korist industrije bi se to povezavo moralo izkoristit za promocijo ter za pridobitev minimalnih finančnih sredstev za participacijo v mednarodnih telesih. Čeprav sam posega po angleških standardih, še vedno smatra, da je prevod za marsikaterega od zaposlenih v razvoju smiseln. Če pa si vključen v oblikovanje, je lažje operirati z angleškim standardom. Izobraževanja s strani SIST se udeležuje, sicer pa se bolj udeležuje izobraževanj, ki jih ponuja Agencija Poti. Nepoznana mu je povezava med SIST in Agencijo Poti; predlaga tudi združitev za namen promocije. SIST bi lahko izkoristil znanje strokovnjakov, ki so vključeni v posamične odbore na mednarodni ravni in ga posredovali drugim podjetjem (izobraževanja z zunanjimi predavatelji/ strokovnjaki z določenega področja).

Preliminary interview 9

OBRAZEC: GLOBINSKI INTERVJU
KRAJ IN DATUM: 25. september 2019 ČAS TRAJANJA INTERVJUJA: 30 min
DELO V POVEZAVI S STANDARDIZACIJO: V standardizaciji sodeluje s SIST-om že od ustanovitve, preko katerega deluje tudi v tehničnih komitejih v CENELEC-u, na področju priklopnikov.
KLASIFIKACIJA STANDARDOV /
UPORABA STANDARDOV V SLOVENSKIH PODJETJIH Za mala podjetja so standardi dragi.
SODELOVANJE PRI OBLIKOVANJU STANDARDOV Kot vodja strateškega razvoja ima vpogled v to, kaj se dogaja, predvsem na področju priklopnikov. Administrativna in formalna podpora s strani SIST-a je zagotovljena. Vse ostalo zagotovi podjetje. ETI dela izdelke, ki so standardizirani, zato je v interesu ETI-ja, da pri tem sodeluje. Gre za minimalni standard sodelovanja s SIST-om. SIST pa ni edini kanal za sodelovanje pri standardizaciji; obstajajo področja, ki jih SIST ne pokriva (npr. mednarodna združenja , ki oblikujejo specifične standarde za specifične industrije). Tudi tu bi lahko avizirali širjenje zakonske podlage SIST-a, da se aktivno vključi tudi na teh področjih in članom omogoči delovanje na širši ravni/ več tematikah.
PRILOŽNOST ZA SIST Tehničnih pregledov in testiranja ne vidi v domeni SIST-a; tudi akreditacija ni v domeni SIST-a. SIST bi moral omogočati prevajanje standardov. Za to so zainteresirana predvsem podjetja, ki proizvajajo za slovenski trg. So pa prevodi mizerno plačani, kar je tudi problem.

SIST-u primanjkuje strokovnega osebja.
MNENJE O SISTU IN STANDARDIZACIJI Kot zastopnik izvoznikov (95% proizvodnje ETI je namenjeno tujim trgom) čuti pomanjkanje podpore tistim, ki delujejo v mednarodni standardizaciji, katere cilj je, da se že v pripravi mednarodnih standardov spoznava konkurenčno tehnologijo, ki šele prihaja na trg, ter ljudi, ki se s tem ukvarjajo. To doprinese podjetjem konkurenčno prednost. Glas Slovenije je v odborih IEC popolnoma enakovreden kot glas drugih držav (tudi večjih npr. Kitajska, ZDA), zato je možnost vpliva na oblikovanje standardov na mednarodni ravni proporcionalno gledano velika (v EU sicer manj, a proporcionalno gledano prav tako). Do leta 2008 je SIST še finančno podpiral potovanja na srečanja mednarodnih odborov, od takrat dalje pa se SIST brani z argumentom, da takšna podpora ni zakonsko določena. Zakon predvideva uvoz vseh standardov, sodelovanje v vseh organizacijah, informacijsko točko, prodajo in trženje standardov. Podpore mednarodnemu sodelovanju pri standardizaciji pa zakon ne predvideva, zato je potrebno zakonsko podlago za delovanje SIST-a razširiti in dodati podporo slovenskim podjetjem, ki aktivno sodelujejo pri oblikovanju standardov na mednarodni ravni. (opomba: to je sogovornik že večkrat predlagal tudi vodstvu SIST-a). Če se že govori o podpori slovenskemu gospodarstvu, le-ta že obstaja za razvojne projekte (subvencije), za raziskovalne projekte (davčne olajšave), gospodarska diplomacija, preko GZS tudi, vendar se zato plača tudi članarina; pri standardizaciji pa imamo velike strokovnjake, a če ni podpore, jih tudi vodstvo ne bo podpiralo. Ministrstvo za gospodarstvo bi lahko tudi na ta način podpiralo slovenska izvozna podjetja.

Preliminary interview 10

OBRAZEC: GLOBINSKI INTERVJU
KRAJ IN DATUM: 2.10.2019 ČAS TRAJANJA INTERVJUJA: 1h 15 min
DELO V POVEZAVI S STANDARDIZACIJO: Član SIST strokovnega sveta za splošno področje. 40 let delovnih izkušenj s standardi.
KLASIFIKACIJA STANDARDOV /
UPORABA STANDARDOV V SLOVENSKIH PODJETJIH /
SODELOVANJE PRI OBLIKOVANJU STANDARDOV Za področje tehnike je Slovenija nedvomno prešibka, da bi sploh razmišljala o čem takem. Nemčija je vodilna. Standardizacijo sogovorec ne povezuje z inovacijami. Podjetjem je za mednarodno konkurenčnost na področju inovacij dovolj, da svoje izdelke patentirajo.
PRILOŽNOST ZA SIST Za slovenske standarde, ki so predpisani z zakonom, podzakonskimi akti in uredbami EU kot obvezni za uporabo, je treba zagotoviti prost, javen dostop. Intervencije s strani stroke za brezplačen dostop do zakonsko obveznih standardov so bile do sedaj neuspešne. Sredstva za prevode in javen dostop naj SIST zagotovi iz proračuna RS. Pri tem bo imel SIST, po sogovornikovem prepričanju, polno podporo slovenske strokovne in akademske javnosti. Ne vemo, kako poteka standardizacija na Kitajskem. SIST bo moral na nek način organizirati spremljavo izhajanja standardov gospodarskih velesil (Japonska, Južna Koreja, Kitajska), ki se pojavljajo na našem tržišču s svojimi proizvodi in tudi investicijami. Sogovorniku ni poznano, kako je to organizirano na EU nivoju. Prevajati vse standardi nima smisla; prevedeni pa bi morali biti vsi standardi, ki so zakonsko določeni. Ker je to velik zalogaj, sogovornik predlaga, da se prevede vsaj terminologijo vsakega standarda in ustvari slovenski slovar. To je potrebno predvsem zaradi kvalitetnega in nedvoumnega razumevanja vsebine standarda, ki je sicer prevzet v tujem jeziku. V proceduro objavljanja zakonov in podzakonskih aktov v katerih se zakonodajalec sklicuje oziroma navaja določene standarde je potrebno vključiti SIST kot revidenta, ki naj preveri pravilnost navedb, seveda še pred objavo v Uradnem Listu RS.
MNENJE O SISTU IN STANDARDIZACIJI Vključevanje deležnikov je dobro. Celo bolje, kot bi sogovornik pričakoval. Slabo mnenje ima sogovornik do SIST-a, ko je govora o zahvali in zaslužku članov, ki pomagajo pri pripravi standarda za slovenski prostor. Ti posamezniki pomagajo pri oblikovanju standarda s tem, da poskrbijo, da je standard primerno prilagojen za slovenski prostor. Po končanem delu oddajo vse avtorske pravice, standard pa morajo nato še kupiti. Dobili bi lahko vsaj ta standard zastonj, pri katerem so pomagali sodelovati.

V Sloveniji je velik problem to, da zakonodaja predpiše standard, ki je kmalu zastarel. Rešitev bi bila enostavna. Pri oblikovanju zakona bi morali dodati člen, ki bi omogočil, da bi zakonsko veljale tudi nove, posodobljene izdaje istega standarda, ne le original. SIST-ovo vlogo vidi kot glavni revident. SIST bi moral nadzorovati, ali je standard še uporaben ali ne. SIST je primerno organiziran, a kadrovsko in finančno podhranjen. SIST opravlja svoje poslanstvo v skladu z zakonodajo in svojim statutom.

Appendix 3: Questionnaire

This questionnaire was administered online by the help of 1-ka platform and was originally only in the Slovenian language.

Q1 –Označite, kako močno po vašem mnenju standardi vplivajo na produktivnost vašega podjetja. (How strongly do you recognize the effect of standards on your company's productivity?)

	0 - brez vpliva (no effect)	1	2	3	4	5	6 - zelo močan vpliv (very strong effect)
	◯	◯	◯	◯	◯	◯	◯

Q2 - Označite, kako standardizacija vpliva na konkurenčnost vašega podjetja. (How strongly do you recognize the effect of standards on the competitiveness of your company?)

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
Pozitivno vpliva na ugled podjetja.(Positively contributes to the image of our company.)	◯	◯	◯	◯	◯
Povzroča dodatne stroške za naše podjetje. (Generates additional costs for our company.)	◯	◯	◯	◯	◯
Povzroča dodatne stroške na področju razvoja. (Generates additional costs for R&D.)	◯	◯	◯	◯	◯
Pozitivno vpliva na izvoz. (Positively affects the opportunites for export.)	◯	◯	◯	◯	◯
Omogoča ekonomije obsega. (Enables economies of scale.)	◯	◯	◯	◯	◯

Q3 - Označite, kako močno se strinjate oziroma ne strinjate s spodnjimi trditvami. (How strongly do you agree or disagree with the following statements.)

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
V podjetju kupimo in implementiramo standard predvsem zato, ker tako zapoveduje zakonodaja. (In our company, we usually buy and implement a standard because of legislation.)	◯	◯	◯	◯	◯
V podjetju kupimo in implementiramo standard predvsem zato, ker tako zapovedujejo predpisi o varovanju potrošnika. (In our company, we usually buy and implement a standard because of the consumer protection regulations.)	◯	◯	◯	◯	◯
V podjetju kupimo in implementiramo standard predvsem zato, ker tako zahteva kupec. (In our company, we usually buy and implement a standard because of our buyers.)	◯	◯	◯	◯	◯

Q4 - Označite, približno koliko standardov ste v zadnjih petih letih kupili, ker so tako zahtevali zakonodajni predpisi. (How many standards has your company bought in the last five years because of legislation?)

◯ 1

◯ 1-5

◯ 6-10
◯ 11-20
◯ 21-30
◯ 31-40
◯ 41-50
◯ Več kot 50 (more than 50)
◯ Ne vem (I do not know)

Q5 - Označite, kako močno se strinjate oziroma ne strinjate s spodnjimi trditvami, pri čemer se trditve navezujejo le na standarde, ki so zakonsko predpisani. (How strongly do you agree or disagree with the following statements regarding standards that are part of legislation?)

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
Pomembno je, da so standardi prevedeni v slovenski jezik, saj jih uporablja večja skupina ljudi. (It is important that standards are translated into Slovenian language because they are used by a large group of people.)	◯	◯	◯	◯	◯
Pomembno je, da so standardi v angleškem jeziku, saj se tako lažje sporazumevamo s tujimi podjetji in zaposlenimi. (It is important that standards are in English because it makes our communication with foreign companies and our employees easier.)	◯	◯	◯	◯	◯
Pomembno je, da je prevedena terminologija standarda. (It is important that the terminology of the standard is translated.)	◯	◯	◯	◯	◯
Pomembno je, da so podjetja zgodaj obveščena o novih predpisih. (It is important that the companies are informed about new regulation requirements early on.)	◯	◯	◯	◯	◯
Pomembno je, da so na voljo praktična usposabljanja za uvedbo zakonsko predpisanih standardov. (It is important that companies have the opportunity to attend practical trainings for the implementation of standards that are part of legislation requirements.)	◯	◯	◯	◯	◯

Q6 - Označite, približno koliko standardov ste v zadnjih petih letih kupili v obliki gradiva pri enem od pooblaščenih ponudnikov na lastno pobudo, ne da bi ti bili predpisani z zakonodajo. (How many standards has your company bought in the last five years on its own initiative?)
◯ 1-5
◯ 6-10
◯ 11-20
◯ 21-30
◯ 31-40
◯ 41-50
◯ Več kot 50 (more than 50)
◯ Standarda na lastno pobudo naše podjetje ni kupilo. (Our company has never bought a standard on its own initiative.)
◯ Ne vem. (I do not know.)

Q7 - Označite, približno koliko standardov ste v zadnjih petih letih uvedli v poslovanje (na ravni procesov, izdelkov, storitev in na druge načine) na lastno pobudo, ne da bi to od vas zahtevala zakonodaja. (How many standards has your company implemented in the last five years on its own initiative?)
◯ 1-5

◯ 6-10
◯ 11-20
◯ 21-30
◯ 31-40
◯ 41-50
◯ Več kot 50 (more than 50)
◯ Standarda na lastno pobudo naše podjetje ni kupilo. (Our company has never bought a standard on its own initiative.)
◯ Ne vem. (I do not know)

Q8 - Označite, kako je standardizacija v preteklosti vplivala na konkurenčnost na vašem trgu. (How has standardization affected competition within your market?)

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
Standardizacije je določila merila za diferenciacijo izdelkov in storitev. (Standardization provided benchmarks for differentiation of products and services.)	◯	◯	◯	◯	◯
Standardizacija je preprečila cenovne vojne v panogi. (Standardization helped industry avoid price wars to the bottom.)	◯	◯	◯	◯	◯
Standardizacija je pozitivno vplivala na tržni delež podjetja. (Standardization positively contributed to the market share of our company.)	◯	◯	◯	◯	◯
Standardizacija je omogočila vstop na nova geografska tržišča. (Standardization enabled entry into new geographical areas.)	◯	◯	◯	◯	◯
Standardizacija je vplivala na povečanje raznolikosti dobrin in storitev. (Standardization influenced the increase in variety of goods and services.)	◯	◯	◯	◯	◯
Standardizacija je vplivala na povečanje koncentracije podjetij na trgu. (Standardization influenced the increase in concentration in the market.)	◯	◯	◯	◯	◯

Q9 - Označite, kako standardizacija vpliva na inovativnost v vaši panogi. (How has standardization affected innovation within your industry?)

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
Standardizacija povzroča zaostajanje panoge v tehnološkem razvoju. (Standardization causes the industry to leg behind in technological development.)	◯	◯	◯	◯	◯
Standardizacija lajšala prenos tehnologij, ki s tem postajajo dostopnejše. (Standardization facilitates the transfer of technologies by making them more accessible.)	◯	◯	◯	◯	◯
Standardizacija spodbuja razvoj inovacij z razširjanjem znanj. (Standardization encourages innovation by disseminating new knowledge.)	◯	◯	◯	◯	◯
Standardizacija spodbuja nastanek novih poslovnih področij znotraj naše panoge. (Standardization encourages the development of new sectors within our industry.)	◯	◯	◯	◯	◯
Standardizacija zavira inovacije zaradi neustreznih določil v standardih. (Standardization hinders	◯	◯	◯	◯	◯

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
innovations by sticking to inadequate technical provisions.)					

Q10 - Označite, kako močno se strinjate oziroma ne strinjate s spodnjimi trditvami. (How strongly do you agree or disagree with the following statements?)

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
Standardi so izboljšali kakovost izdelkov in storitev našega dobavitelja. (Standards have improved the quality of our suppliers' products and services.)	◯	◯	◯	◯	◯
Standardi so omogočili boljšo komunikacijo z drugimi podjetji. (Standards have enabled better communication with other companies.)	◯	◯	◯	◯	◯
Standardi spodbujajo sodelovanje z drugimi deležniki. (Standards have encouraged communication with other stakeholders.)	◯	◯	◯	◯	◯

Q11 - Označite, kako po vašem mnenju standardizacija znotraj vaše verige vrednosti koristi podjetjem glede na njihovo velikost. (How does standardization benefit the companies in your supply chain based on their size?)

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
Standardizacija sorazmerno koristi vsem podjetjem v naši verigi vrednosti. (Standardization benefits all companies in our value chain.)	◯	◯	◯	◯	◯
Standardizacija koristi velikim podjetjem v naši verigi vrednosti. (Standardization benefits big companies in our value chain.)	◯	◯	◯	◯	◯
Standardizacija bolj koristi manjšim podjetjem v naši verigi vrednosti. (Standardization benefits smaller companies in our value chain more.)	◯	◯	◯	◯	◯
Standardizacija bolj koristi tistim, ki so na dnu verige vrednosti. (Standardization benefits the companies at the bottom of our value chain more.)	◯	◯	◯	◯	◯

Q12 - Označite, kako uporaba standardov vpliva na obvladovanje tveganj vašega podjetja. (How does the use of standards contribute to risk management of your company?)

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
Standardizacija prispeva k povečanju skladnosti s pravili. (Standardization contributes to the optimisation of compliance with regulations.)	◯	◯	◯	◯	◯
Standardizacija vodi k boljši opredelitvi in dodelitvi odgovornosti. (Standardization leads to better determination of responsibilities.)	◯	◯	◯	◯	◯
Standardizacija omogoča večji nadzor nad problemi varnosti izdelkov in storitev. (Standardization allows greater control over security-related problems.)	◯	◯	◯	◯	◯
Omogoča doseganje ciljev trajnostnega razvoja.	◯	◯	◯	◯	◯

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
(Standardization enables the achievement of sustainability objectives.)					

Q13 - Označite, kako močno se strinjate oziroma ne strinjate s spodnjimi trditvami. (How strongly do you agree or disagree with the following statements?)

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
V našem podjetju smo dobro obveščeni o možnostih vpliva na oblikovanje novih standardov. (In our company, we are well informed about our opportunities to contribute to the develeopment of new standards.)	◯	◯	◯	◯	◯
V našem podjetju smo dobro obveščeni o izidu novih standardov. (In our company, we are well informed about the newly published standards.)	◯	◯	◯	◯	◯
V našem podjetju smo dobro obveščeni o možnostih članstva v Slovenskem inštitutu za standardizacijo (SIST) (In our comapny, we are well informed about the possibilities of membership in SIST.)	◯	◯	◯	◯	◯
V našem podjetju se redno izobražujemo na področju standardizacije. (In our company, we regularly train our staff on all topics of standardization.)	◯	◯	◯	◯	◯

Q14 - Označite, katera izmed spodnjih trditev velja za vaše podjetje (Which of the following statements holds true for your company?)

◯ Naše podjetje ne sodeluje v procesu standardizacije (ne spremlja oblikovanja novih standardov niti jih ne oblikuje). (Our company does not participate in the process of standardization, does not monitor the development of new standards nor does it develop new standards.)
◯ Naše podjetje sledi informacijam o nastajanju novih standardov. (Our company monitors the development of new standards.)
◯ Naše podjetje spremlja informacije o nastajanju novih standardov in podaja pripombe odgovornim organom. (Our company monitors the development of new standards and gives comments to the appropriate organization.)

IF (1) Q14 = [3] (Naše podjetje spremlja informacije o nastajanju novih standardov in podaja pripombe odgovornim organom.) (Our company monitors the development of new standards and gives comments to the appropriate organization.)
Q15 - Označite, kako močno se strinjate oziroma ne strinjate s spodnjimi trditvami v zvezi s sodelovanjem v procesu standardizacije. (How strongly do you agree or disagree with the following statements regarding the participation in the standardization process?)

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
S sodelovanjem pri standardizaciji smo ozaveščeni v zgodnji fazi o prihodnosti regulacije trga in o trendih v naši panogi. (By participating in the standardization process, our company gains early awareness of future market rules and emerging	◯	◯	◯	◯	◯

	Se ne strinjam (I disagree)	Se bolj ne strinjam kot strinjam (I disagree more than I agree)	Niti – niti (Niether)	Se bolj strinjam kot ne strinjam (I agree more than I disagree)	Strinjam se (I agree)
trends in our industry.)					
S sodelovanjem pri standardizaciji nam je omogočena promocija interesov lastne industrije na nacionalni ravni. (By participating in the process of standardization, our company is able to promote the interests of its industry on a national level.)	◯	◯	◯	◯	◯
S sodelovanjem pri standardizaciji nam je omogočena promocija lastnih interesov na nacionalni ravni. (By participating in the standardization process, our company is able to promote its interests on a national level.)	◯	◯	◯	◯	◯
S sodelovanjem pri standardizaciji nam je omogočena promocija interesov lastne industrije na mednarodni ravni. (By participating in the standardization process, our company is able to promote the interests of its industry on an international level.)	◯	◯	◯	◯	◯
S sodelovanjem pri standardizaciji nam je omogočena promocija lastnih interesov na mednarodni ravni. (By participating in the standardization process, our company is able to promote its interests on an international level.)	◯	◯	◯	◯	◯
S sodelovanjem pri standardizaciji nam je omogočeno, da vodimo razvoj svojega trga z močjo vpliva na lastnosti novih standardov. (By participating in the standardization process, our company is able to lead the development of our market.)	◯	◯	◯	◯	◯
S sodelovanjem pri standardizaciji nam je omogočen dostop do informacij, ki jih podjetje drugače ne bi dobilo. (By participating the process of standardization, our company gains access to information that would otherwise not have access to.)	◯	◯	◯	◯	◯

IF (2) Q14 = [1] (Naše podjetje ne sodeluje v procesu standardizacije (ne spremlja oblikovanja novih standardov niti jih ne oblikuje).) Our company does not participate in the process of standardization; does not monitor the development of new standards and does not develop new standards.)
Q16 - Označite, zakaj vaše podjetje ne sodeluje v procesu standardizacije. (Why does your company not participate in the process of standardization?)

◯ Naše podjetje nima dovolj finančnih sredstev, da bi lahko aktivno spremljalo nastajanje novih standardov in dajalo konstruktivno kritiko. (Our company does not have enough financial resources to actively monitor the development of new standards and give construcive criticism.)

◯ Naše podjetje nima dovolj tehnično izobraženega kadra, da bi lahko aktivno spremljalo nastajanje novih standardov in dajalo konstruktivno kritiko. (Our company does not have enough technically educated staff to actively monitor the development of new standards and give construcive criticism.)

◯ Sodelovanje pri procesu oblikovanja novih standardov nima učinka na naše poslovanje. (Participation in the process of standardization does not have any effect of our business.)

◯ Nič od zgoraj naštetega. (None of the above.)

Q17 - Označite tista področja, kjer mislite, da bi slovenska standardizacija morala bolj aktivno delovati za vzpostavitev mednarodne konkurenčnosti.
Možnih je več odgovorov

☐ Doseganje ciljev trajnostnega razvoja (The achievement of the objectives of sustainability)

☐ Blockchain tehnologije (Blockchain technology)
☐ Omrežna varnost (Cyber security)
☐ Sledenje izhajanju standardov azijskih gospodarskih velesil (Monitoring of the development of standards in Asian markets)
☐ Genski inženiring (Genetic engeneering)
☐ Varovanje okolja (Environmental protection)
☐ Pravična mednarodna menjava (Fair international trade)
☐ Oblikovanje produktov in storitev (The design of products and services)
☐ investiranje (Investments)
☐ Drugo: (Other)
☐ Sem brez mnenja. (I have no opinion)

Q18 - Označite, preko katere organizacije vaše podjetje najpogosteje kupuje nove standarde. (Where does you company normally buy new standards?)
Možnih je več odgovorov (More than one possible answer)
☐ International Organization for Standardization (ISO)
☐ CEN-CENELEC
☐ Slovenski inštitut za standardizacijo (SIST)
☐ Swiss Association for Standardization (SNV)
☐ Austrian Standards International (ASI)
☐ German Institute for Standardization (DIN)
☐ Estonian Centre for standardization (EVS)
☐ Electrotechnical Commission (IEC)
☐ British Standards Institute Group (BSI Group)
☐ French national organization for standardization (AFNOR)
☐ Nakup opravlja matična družba. (The purchase is done by our parent company)
☐ Drugo: (Other)
☐ Ne vem. (I do not know)

Q19 - Označite, preko katere organizacije se vaše podjetje najpogosteje izobražuje glede standardov. (With the help of which organization does you company normally educate their staff about new standards?)
Možnih je več odgovorov (More than one possible answer)
☐ Bureau Veritas
☐ Slovenski inštitut za kakovost in meroslovje (SIQ)
☐ Slovenski inštitut za standardizacijo (SIST)
☐ Technisher Uberwachungsverein (TUV)
☐ SGS Slovenija
☐ Slovensko združenje za kakovost in odličnost (SZKO)
☐ Slovenska akreditacija
☐ Urad RS za meroslovje (MIRS)
☐ Zavod za gradbeništvo Slovenije (ZAG)
☐ se ne izobražuje oziroma se izobražuje sam. (The company does not train their staff or the employees educate themselves.)
☐ Drugo: (Other)

Q20 - Ali veste, da Slovenski inštitut za standardizacijo (SIST) omogoča podjetjem, da lahko sodelujejo pri nastajanju novih mednarodnih in evropskih standardov z zgodnjim obveščanjem in dajanjem pripomb? (Are you aware with the fact that SIST offers companies the opportunites to participate in the development of new international and European standards by informing them about new standards and offering them the ability to give their own comments?)
○ Da (Yes)
○ Ne (No)

Q21 - Ste seznanjeni z možnostjo dostopa do osnutkov novih standardov, ki so v javni obravnavi, preko spletnega portala Slovenskega inštituta za standardizacijo (SIST)? (Are you aware of the fact that you can access the drafts of new standards that are in the process of getting public approval through the SIST

platform?)
◯ Da (Yes)
◯ Ne (No)

Q22 - Ali ste seznanjeni s tem, da kontaktna točka Slovenskega inštituta za standardizacijo (SIST) nudi brezplačne informacije o predlaganih ali sprejetih tehničnih zahtevah za posamezne proizvode in storitve tako slovenskih kot tudi drugih držav članic? (Are you aware of the fact that SIST's contact point offers free information about the accepted and the proposed technical provesions for products and services in Slovenia as well as other EU members?)
◯ Da (Yes)
◯ Ne (No)

Q23 - Ali je vaše podjetje izvozno naravnano? (Is your company oriented towards export?)
◯ Da (Yes)
◯ Ne (No)

IF (4) Q23 = [1] (Da) (Yes)
Q27 - Kateri je vaš prevladujoči trg? (Which is your main export market?)

◯ Evropska unija (European Union)
◯ Države nekdanje Jugoslavije (Ex-Yugoslavia)
◯ Amerika (America)
◯ Azija (Asia)
◯ Drugo: (Other)

Q28 - Kakšne vrste podjetje ste po številu zaposlenih? (What kind of company are you based on size?)

◯ mikro družba (1
◯ majhna družba (10
◯ srednja družba (50
◯ velika družba (250 in več zaposlenih)

Q29 - Označite področje dejavnosti vašega podjetja po standardni klasifikaciji dejavnosti. (Select the business filed of your company based on the standard classification of business activity.)
Možnih je več odgovorov (dva)

☐ Kmetijstvo, lov, gozdarstvo in ribištvo
☐ Rudarstvo
☐ Predelovalne dejavnosti
☐ Oskrba z ekeltrično energijo, plinom in paro
☐ Oskrba z vodo, ravnanje z odplakami in odpadki, saniranje okolja
☐ Gradbeništvo
☐ Trgovina, vzdrževanje in popravila motornih vozil
☐ Promet in skladiščenje
☐ Gostinstvo
☐ Informacijske in komunikacije dejavnosti
☐ Finančne in zavarovalniške dejavnosti
☐ Poslovanje z nepremičninami
☐ Strokovne, znanstvene in tehnične dejavnosti
☐ Druge raznovrstne poslovne dejavnosti
☐ Dejavnost javne uprave in obrambe, dejavnost obvezne socialne varnosti
☐ Izobraževanje
☐ Zdravstvo in socialno varstvo
☐ Kulturne, razvedrilne in rekreacijske dejavnosti
☐ Drugo:

Q30 - Označite, ali ste član Slovenskega inštituta za standardizacijo (SIST) (Are you a member of SIST?)

◯ Da (Yes)
◯ Ne (No)