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Abstract

We often speak of tech entrepreneurs these days as a driving force of progress and economic growth. Being an entrepreneur entails risks and uncertainty, and creative people invest large quantities of their money, their time, and their creativity in bringing to market something that may or may not gain popular interest and become profitable. While political discourse tends to emphasize the importance of entrepreneurs, innovation, creativity, and high-end technologies, policies are rarely constructed in ways that truly favour the entrepreneurs in their endeavours. Policy makers and regulatory bodies are passing more and more regulations and creating specific certifications and standards that all products must comply with. One of the main issues that every company or individual developing a product for the European market needs to deal with is the CE Marking, a procedure that is in appearance about assuring safety, consumer health and care for the environment but that in reality doesn't mean much for either the producer or the consumer. The red tape in the case of CE Marking is so sheer and complex that is makes it almost impossible to be fully compliant. This study aims to assess the usefulness of CE Marking and Certification regulations and their impact on costs for manufacturers and distributors. Using a variety of surveys, interviews and public data analysis we conclude that the CE Marking's associated costs far exceed its benefits.

Keywords: *product certification; business regulation; bureaucracy; compliance.*

JEL classification: L15; K23; L51; L60.

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1 Introduction

1.1 How CE Marking Appeared and Evolved

Harmonisation and standardization of national legislation at the level of the European Economic Community (EEC) began in 1957 with the Treaty of Rome and the beginning of the internal market. However, more specific discussions on liability and the effectiveness of free trade on the European market started in 1976 with the proposals for a directive concerning liability for defective products, which stood at the base of the late 1985 New Approach, whose foundation was the noble idea of creating a general framework that will allow competition to thrive, since all Member States had different regulations regarding liability and safety (Official Journal of the European Communities 1976). One of the main barriers of free trade was the fact that all Member States had their own safety regulations thus making it nearly impossible for a pair of protection glasses made in Spain to be sold on the German market.

The slow progress of the harmonization programme lead to a change of the EC policy, through the decision of the European Court of Justice in the `Cassis de Dijon` case which stipulated that Member States are responsible to regulate the quality of their products (European Court of Justice 1979). This decision meant that the product manufactured and marketed in one of the Member States, following the national standards could be freely imported in another Member State without following the national regulations of that specific state (Ogus 2004).

Later, in 1985, the EEC have initiated the "New Approach for Harmonised Directives and Standards". The legislative act adopted on May 7th, 1985 talks about "an area without internal frontiers" that would allow for the free movement of goods, people, services and capital without restriction on imports between Member States (European Council 1985). In December 1989 the Resolution was extended to include all the industrial products which would now have an EC mark on them, which was later changed to CE Marking. One important mention is that the 1989 Global Approach, supplemented by the 90/683/EEC decision, has also introduced more flexible Assessment Procedures but also the manufacturer's self-declaration (Council of the European Union 1990). The assessment was therefore divided according to the different product development stages, such as design, prototype and full production, considering also the type of assessment needed and the party in charge of the assessment (either the manufacturer or a third party). A following update was done through the decision 93/465/EEC which extended the general guidelines and detailed the procedures for the conformity assessment based on the party in charge of the control activities and verification.

The CE Marking was supposed to work as a passport for goods being sold on the EU internal market (The Netherlands Court of Audit Communications Department 2017). The New Approach was mainly based on harmonization of standards with the purpose of increasing the efficiency of the free movement of goods, but, as directives started to

become more and more specific, the path towards over-standardization was clear. A second purpose for the CE marking was added with the EC 765/2008 which referred to providing a high level of protection for the public interest in the areas of health and safety, and the protection of the environment. A number of additional regulations were also introduced in order to keep up with the complexity of technological developments. To this day, regulations are constantly changing, providing standards for newer products that appear, especially in the fields of medical devices, electrical appliances and machinery (The Netherlands Court of Audit Communications Department 2017).

1.2 How CE Marking Is Supposed to Work

Over-standardization. On the abundance of directives

The EU legislation on CE marking is massive and very complex in terms of both general rules and organizational structure. There are 25 different product groups falling under a series of specific directives and regulations (European Commission 2018). These regulations specify the types of products that fall under their scope, the requirements the products need to comply with, the responsibilities and obligations of the parties involved, the conformity procedures and the requirements for applying the CE marking on a product.

As a manufacturer, according to the European Commission's website, only six steps are needed before one can apply the CE marking on the product:

1. Identify the applicable directive(s) and harmonised standards
2. Verify product specific requirements
3. Identify whether an independent conformity assessment (by a notified body) is necessary
4. Test the product and check its conformity
5. Draw up and keep available the required technical documentation
6. Affix the CE marking and draw up the EU Declaration of Conformity

In theory, the directives and regulations only specify a set of *essential requirements* that the manufacturer needs to comply with before releasing a product on the internal market. These essential requirements represented the basis of the standardisation process that should have simplified trade between the member states.

However, for a product that falls into the eco-design category, Directive 2009/125/EC, a 29-page document explains the *essential requirements* for affixing the CE Marking. The Directive focuses especially on environmental aspects that must be assessed for every production phase from raw material to manufacturing, installation, use and end-of life:

a. predicted consumption of materials, of energy and of other resources such as fresh water;
b. anticipated emissions to air, water or soil;

c. anticipated pollution through physical effects such as noise, vibration, radiation, electromagnetic fields;
d. expected generation of waste material; and
e. possibilities for reuse, recycling and recovery of materials and/or of energy, taking into account Directive 2002/96/EC.

On top of these requirements there is an additional list of 13 environmental aspects that focus on emissions, recyclable materials and waste. Additionally, the technical details, which are voluntary, come in the form of *harmonised standards*. In 2018 there were over 3500 harmonised standards, which somehow refutes the idea of a basic set of essential requirements.

All the requirements are developed by the three European Agencies in charge of CE Marking namely: the European Committee for Standardisation (CEN), the European Telecommunications Standards Institute (ETSI) and the European Committee for Electro-Technical Standardisation (CENELEC), who work alongside the national standardisation bodies from the Member States. Industry and business representatives are also part of the decision-making process at both national and European level, although SMEs very rarely take part in the discussion as costs are usually too high for them (The Netherlands Court of Audit Communications Department 2017).

For a large number of products, the manufacturer can, in theory, be the one who establishes if his products comply with the EU requirements, although a lot of times the abundance of legislation makes it very difficult. For products with increased risks, such as medical devices, the EU regulations make it obligatory for the manufacturer to have a third party assessing the conformity and perform the testing independently. Each Member State is obliged to notify the EU bodies of the existence of these *notified bodies*.

Table 1. New Approach Notified and Designated Organisations Information System (NANDO)

Country	No. of Notified Bodies	No. of Notifying Authorities
Austria	57	14
Belgium	44	11
Bulgaria	46	4
Croatia	31	7
Cyprus	4	6
Czech Republic	45	3
Denmark	38	10
Estonia	14	2
Finland	22	6
France	83	16
Germany	206	11
Greece	30	5
Hungary	34	9

Iceland	1	3
Ireland	6	8
Italy	188	1
Latvia	26	1
Lichtenstein	2	1
Lithuania	15	1
Luxembourg	6	1
Malta	1	1
Netherlands	51	12
Norway	27	7
Poland	80	7
Portugal	30	9
Romania	37	6
Slovakia	28	2
Slovenia	24	1
Spain	70	10
Sweden	44	1
Switzerland	34	1
Turkey	48	1
UK	176	11

Source: (European Commission 2018)

Besides the notified bodies, all Member States have at least one governmental or public authority responsible for the assessment of conformity and the notification of the European Commission. In most cases, Ministries are the ones responsible for the enforcement of the relevant EU Directives and the market surveillance process.

Due to the growing body of legislation that determines which products require the CE Marking, in some cases, it is becoming extremely difficult to know if a product needs the CE Marking. There is no definitive list, nor can there be, of products that need to bear the CE Marking. Notified bodies are generally not able provide an answer to the question of CE Marking requirement, and while CE Marking consultancy firms do provide an answer, in exchange for a significant amount of money, they bear no responsibility in case a product is put on the market under the assumption that it does not require the CE Marking and is then found by a controlling authority or by customs agents to require it. The same applies to the notified bodies.

The lack of responsibility related to CE Marking and its underlying lack of meaning in the eyes of the consumer has led to additional problems when used in international trade. In 2007, a question was raised in the European Parliament (European Parliament 2007) with regards to a logo similar to the CE Marking, one that was most likely invented by Chinese manufacturers and adopted on a large scale in order to facilitate EU market access for Chinese products. The logo, deemed to stand for "China Export", pictured below, was used on merchandise originating in China that was found to be non-compliant

with EU standards. The logo was used to intentionally mislead consumers and authorities and continues to appear on products sold in the EU market to this day. In a sense, the China Export logo is simply an unauthorised copy of the CE Marking, much in the same way as many products originating in China are unauthorised, non-compliant forgeries of original products that do comply with EU standards.

Figure 1. CE Marking vs. China Export Logo

Conformité Européenne China Export

Source: European Parliament 2007

1.3 CE Marking vs. Alternative Quality Assurance Methods

When a marketing company is looking for somebody to hire, they usually search for graduates of relevant study programmes, like communications, public relations and marketing. Sometimes, before setting an interview, they ask their candidates to submit proof of their experience level, which often takes the form of a recommendation from a previous employer. Similarly, when a consumer wants to purchase a new phone, he/she looks not only for the manufacturer's specifications for that phone, but also for third-party reviews from either organizations or private users. Most choices we make are based on quality disclosure, a topic which has been around for a long time, and that has become of interest for regulators relatively recently. Most countries have several institutions which deal with quality assurance and make sure products are safe before they end up on the shelves of a supermarket.

As Arrow (1972) put it, all commercial transactions are based on an element of trust. The existence of CE Marking doesn't mean that other certifications become obsolete. For example, in the UK, the British Standards Institution is a national body that audits and provides certification, training and advisory services for companies in a variety of fields (BSIGroup 2018). Other well-known examples of certifications that are non-mandatory but still acquired by manufacturers include the VDE mark (VDE 2018) in Germany, and the IMQ (2018) in Italy. Because of the self-assessment procedure that doesn't truly give the consumer any objective proof that a product is safe, alternative certification methods are still relied upon. Independent testing and conformity assessment performed by NGOs is also getting traction because they leverage objectivity. For example, the UK's CE Marking Association has a 25-year experience in assisting companies and

manufacturers in becoming compliant with the law. They provide consultancy services and tests for a variety of products (CE Marking Association 2018).

Alternative certification methods include mostly private or crowd-based mechanisms that help overcome the trust issues which might appear between provider and consumer in the case of asymmetry of information. Before national and transnational certification marks, reputation used to be the basis of brand legitimisation. Rao (1994) tests this hypothesis using the certification contests of the American auto industry between 1895 and 1912 as case studies. The results show that reputation is a crucial intangible asset that assures legitimacy and consumer trust.

Certification by private parties is also an important aspect of the quality assurance process in market-economies because it is based on the idea of transparency and trust. Private certification is effective especially when the criteria of providing a conformity assessment is based on performance (Poncibo 2007). Moreover, private certifications come in handy when government regulations take too long to adapt to technological innovations. In the world of e-commerce, the review system aggregated with a rating system from both the marketplace and consumers acts as a valid and extremely effective certification mark. Elfenbein, Fisman, & McManus (2013) have used eBay data to explore the *top-rated seller* certification impact on sales. They conclude that those sellers able to meet the strict performance criteria needed to be listed as *top seller* had 7% higher odds of selling a given item. Furthermore, they argue that certification helps small or newer sellers more than those who already have a solid transaction history, and that certification benefits depend on whether competitors have it or not. In a similar way, platforms such as Yelp (Luca 2011), TripAdvisor, Airbnb or Uber act as *de facto* certifications for the products and services the listed companies or individuals advertise for.

However, manufacturers, distributors and consumers face an increased number of conformity assessments and certification marks, due to changes in country-specific regulations and consumer preference. As a result, most products display about 5 to 10 different marks that are supposedly meant to increase consumer confidence. This naturally produces an increased level of confusion among end-users (Barron 2007)

1.4 From third-party certification to CE Marking

Auriol and Schilizzi (2003, p.3) define product certification as:

> "A process whereby an unobservable quality level of some product is made known to the consumer through some labelling system, usually issued by a third independent party."

There are, however, cases in which quality assurance does not need to be initiated by a third independent party like in the case of compulsory certification, as branding or a review system achieve similar results, bringing a higher overall level of transparency.

Hardware retailers often publish consumer reviews and RMA (Return Merchandise Authorization) rates on their websites, which gives the consumer additional information on whether they should purchase the product or not. Online marketplaces, like Amazon or eBay, rely heavily on their customer review systems to build trust in the quality of products and in the service level and business practices of sellers present on the marketplace.

Economists tend to agree that for a signal to be economically significant it must bear a certain cost that depends on the quality of the product or service being offered. Since advertising and review systems to a certain extent might be considered `cheap talk`, expression used in the signalling theory to name the signals providers send at no cost (Farrell and Rabin 1996), compulsory certification might represent a more costly signalling strategy for the provider. To tackle this issue, our research is focused on compulsory, regulated quality assurance and disclosure in the EU, specifically CE Marking.

At the core of product certification lies Akerlof's theory on the asymmetry of information (Akerlof 1970), a theory which explains the knowledge problem in a market where parties are maybe not always incentivized in disclosing all the information they have about a certain product or service. While many have argued for regulation as a solution to solving the asymmetry problem, as Thomas DiLorenzo (2011) explains, quoting Mises (1998), the asymmetry of information is actually synonymous with *the division of labour* or *knowledge*, which is the basis for success and trade in a market economy, as its opposite - completely symmetric information - would imply that all market participants would possess at any given point the same information (understood as *knowledge)* about all changes in data, which is impossible not only because it would make the division of labour and business *per se* obsolete but also because individuals are bound to value and understand the same information differently (Mises, 1998, p. 325). However, while asymmetries of information as direct results of specialization through which the individual knowledge expands, are a normal ingredient of an advanced economy, they can sometimes lead parties in a transaction to give up an opportunity for cooperation because they lack trust in the true object of the cooperation. The communication of quality information remains nevertheless problematic even if technological development and consumer choice have increased its importance. Ogus (2004) talks about the differences in asserting quality for different categories of products, such as search goods, experience goods and credence goods, and the variety of quality information channels available to suppliers through advertisement, contractual terms such as product warranties and the reliance on proxies in cases of products with a difficult- to assess quality.

From the perspective of the public interest, regulation requiring the disclosure of quality information should maybe be considered only for products that give rise to problems for consumer choice of a relatively high magnitude. Hence, the case for certification is based on a few assumptions about its role: (a) *increased transparency*, (b) *increased safety* and (c) *greater product quality*, as they are requested, understood and valued by consumers.

As all of them are factors influencing consumers' purchasing decisions, the CE marking should probably influence consumer perception in the positive way.

However, the case for regulation of quality disclosure should account for the fact that market competition incentivizes producers to disclose the relevant quality information voluntarily, as a way of separating themselves from the competition. While the degree of market discipline has the tendency to be higher for `search goods` where it is often the case that a high number of discriminating consumers are purchasing at a margin, `experience` goods make producers invest in creating a brand name, whose reputation becomes the selling point. Then, the disclosed information is in fact related to consumer perception. Producers will disclose the attributes which the typical consumer perceives to be important and which act as differentiator in the context of a purchasing decision (Ogus 2004).

Consumer perception in the case of certification becomes a challenge for the certification's effectiveness if the marking does not generate acknowledged confidence. As Auriol and Schilizzi (2003, p.3) put it:

> "Obviously, a major concern with certification is consumer confidence which depends on the credibility of the certification process and stamp. It must be done by an authority above all suspicion."

Starting from this premise the marking's perceived effectiveness is linked to the consumer's confidence in the authority issuing it. As the European Union is indirectly the issuer of the CE marking, we assume that consumer's confidence should be generally high, especially in terms of it offering *product safety* and *increased transparency.* Therefore, we will test the assumprion that product certification is perceived by the consumers as being useful and that it is one of the factors that influences consumers' purchasing decisions.

One of the problems that need to be assessed with respect to compulsory certification and customer perception is the moral hazard. Since all companies across the EU providing goods that fall under the CE marking regulatory framework need to bear the marking, consumers and clients tend to believe that every product if safe for use, without a lot of additional assurance measures.

Historically, increased awareness and demand for transparency, safety and product quality came with rising living standards in wealthier industrialized societies. Nelson (1970) developed a categorization for quality signalling using search attributes – understood as the attributes consumers can assess before purchasing a product (such as size or colour), and experience attributes – qualities the consumers assess after the purchase (like performance or functionality). Darby & Karni (1973) added a third category, namely credence – attributes whose assessment cannot be done neither before nor after buying the product (such as environmental footprint, impact on overall health). Their model shows that certification in the form of private evaluators, branding and the client relationship are often, but not always, solutions for fraudulent attempts and that no

case for governmental intervention can be made even in cases of markets where deception is happening. This is because the overall social welfare of such an intervention cannot justify the costs and also because state evaluators are subject to the same temptation for bribe or subjectivity as the private ones.

However, the customer should not be the only one who benefits from certification, as this would create a no-incentive system for the manufacturer, who is usually the one bearing the initial associated certification and testing costs (Stahl and Strausz 2014), although in the end everything is paid by the consumer. In a competitive market, manufacturers are in fact incentivised to pursue additional product testing and certification if this helps them remain competitive and if this is what consumers perceive to be important. According to Klochkov et al. (2016) the certifier should be the one who knows customers' requirements and develop evaluation criteria that would enable manufacturers to have an objective analysis of their products, which would help them assess the product's risks, defects and malfunctions, and eliminate them. However, consumers' perception with respect to what is deemed by people to be *safe* and *high quality* might be extremely subjective and dependent on a high number of diverse variables such as gender, location or purchasing power. Consumers' needs are usually better assessed in free markets by economic agents using price signals and sales. However, if certification is considered important by consumers within such an environment, then manufacturers would be directly interested in obtaining it. According to EU legislation, certification should add value to the product for both the customer – acting as an assurance of safety and offering detailed information on the product - and the manufacturer – through the product development process - thus not only representing an additional cost. Based on this, we will analyse the assumption that certification brings value to the consumer through increased transparency, safety and greater product quality, but also to the manufacturer, through the risk assessment that can help them create better products for their customers. The value created ought to be perceived by all parties as credible, meaningful and useful.

In developed markets, like the European Union or the United States, entrepreneurs need to bear much more than the direct costs associated to developing and manufacturing a product, so it can be made available to consumers. Compliance and conformity costs complicate the process of bringing products to market, entail additional costs and lost time, thus leading to further indirect costs by delaying product access to the market. Meanwhile, policy makers and regulatory bodies are passing more and more regulations and creating specific certifications and standards that all new products must comply with, thus increasing costs and delays. Based on the information available one can implicitly assume that the size of the regulatory framework for CE Marking generates inefficiencies. This represents another assumption that we will test further in the paper.

At the same time, and at first glance, CE Marking simply shows that a product complies with EU standards on safety, health and the environment. A more in-depth look, however, reveals that it is neither simple nor costless, since compliance is mandatory and

requires large expenditures of both time and money in order to prepare documentation (based on requirements that are neither clear nor consistent) and ultimately provides very few benefits to the consumer in terms of safety, health or improved care for the environment.

From this perspective, regulation considering quality disclosure through certification must take account of the associated costs, including the indirect ones that are not strictly related to assuring product quality, but that can be subdivided in administrative costs – the ones related to the public authority in charge of formulating standards and overseeing compliance; compliance costs – they include either the expenditure for testing equipment, maintenance costs etc. but also indirect and unintended costs. The public interest justification as basis of regulation imposing certification should therefore depend on a cost-benefit analysis of the outcome. Accounting for private interest considerations becomes imperative (Benston), as the observation that compliance costs tend to be proportionally higher for small companies, compared with big firms, makes the assumption that the requirements for CE Marking generate additional costs associated to market entry all the more relevant.

Moreover, as it is almost impossible keep track of all EU directives on CE Marking and corresponding national regulations, and to adequately determine which standards need to be respected, most companies selling technology products in the EU are always breaking some laws. At the very least, companies selling products in the EU encounter difficulties trying to keep up with the frequent changes in CE Marking legislation and standards.

2 Literature Review

Quality disclosure has been a concern for theorists and practitioners in the field of economics at least since 1970, once Akerlof's famous paper discussed the asymmetry of information (Wonnell 1986). Afterwards discussions on market failures, negative externalities and the need to regulate using either private or public methods the presumed inefficiencies of the market has lead scholars like Ogus (2004) to study the public interest models for setting standards and the way these could be implemented by legal instruments, considering both the general and the private interest.

The academic literature in the field of economics, and more specifically signalling theory, lacks research in the field of EU Certification and CE Marking. In fact, even the existing studies on the topic don't address the rationale behind certification which, in our opinion, is the basis for understanding how wide its scope should be. However, some broader works (Hanson, 2005; Tricker, 2000) explore the background of CE Marking and the "New Approach" legislation concerning standardization adopted by the EU in 1985, offering a solid foundation for understanding the evolution of the standardisation process

in the EU, but also the impact on international trade using as a basis the EU-USA trade. Hanson (2005) quotes the Annual Report of the Transatlantic Business Dialog (2000):

> The US-EU trade relationship is one of the largest and most important bilateral trade relationships for the United States. But the existence of heterogeneous standards and duplicative regulatory requirements on both sides of the Atlantic adds greatly to the cost of exporting ... Such redundant testing and certification increase the base cost of exports by up to 15 per cent ... A typical US machine manufacturer may spend $50000 to $100000 annually complying with foreign regulatory requirements – an overwhelming burden to small-to medium-sized exporters[1].

This is one of the very few papers that state the issue of the costs associated with the CE Marking. Most of the research papers on CE Marking address industry-specific regulations and offer insights into what directives apply to each product category, like medical devices (French-Mowat & Burnett, 2012; Bentley, 1999; Heneghan, Thompson, Billingsley, & Cohen, 2011), electronics (Salas and Olias 2009), or military equipment (Keferink 2010). Liepina & Korablova's (2014) research on the market surveillance of toys highlights the lack of compliance of many products available on the market, while Klembalska & Fancello (2015) suggest that the pre-EU adherance certification safety mark in Poland covered a much wider range of requirements and rigourous testing. However, their results also show a decrease in the number of third-party testing under CE Marking but also a decrease in the number of accidents resulted from agricultural machinery malfunctions. In our opinion, this suggests that companies are more prone to making sure products function well because the costs associated with their brand being responsible for accidents would by far exceed the costs of assuring safety. Especially in the case of machinery or electronics, manufacturers would undergo extensive testing even in the absence of regulatory bodies requiring it, due to potential loss of reputation in case of a malfunction. From this perspective, the CE Marking should act as a reputation enhancer.

Broader reports address the applicability of the CE Marking and its structural problems. The Algemene Rekenkamer (2017) report on the compliance of CE Marking on the European Market concludes that some of the most important issues include: a) a fragmented accountability to the Dutch Parliament, as there are a lot of public institutions that deal with only small parts of the conformity assessment and report to different inspectorates and ministeries - this makes it difficult to have a clear picture over the national situation; b) weaknesses in the regulation of CE Marking – the authors wrongfully[2] conclude that:

> `there is an inherent tension in the way in which the system is designed: the economic interests of the economic operators (such as their desire to increase their market share

[1] We were not able to trace back to the original source, so the quote was copied from Hanson (2005, p. 4)

[2] We argue for the contrary in the paper's introduction

> and maximise their profits) are not automatically compatible with the need to safeguard public interests, as is the intended purpose of the system of CE Marking';

c) the abundance of market surveillance authorities that are stricter in some Member States – being a public policy report, the authors suggest increasing the budgets of the monitoring authorities as a solution which, in our opinion, would only lead to increased costs and a higher burden on taxpayers; and d) the lack of provisions for consumers – here we argue that consumers don't act based on the conformity assessment performed by public authorities but rather based on different digital methods as well as brand reputation that allow them to make sure a product is safe according to their needs.

On the consumers' perception with respect to certification, Poncibo (2007) analyses the perceived consumer effectiveness of certification and concludes that even though the certification might not give the consumer enough information for them to be able to make an informed decision, it does provide the consumer with the psychological assurance that the product is the "right choice". Although it gives the consumer a certain peace of mind, it is unclear whether the public benefits deriving from assuring the consumer of their choice overcome the associated private costs borne by the companies. Barron (2007) analyses the role of product certification marks in the US and the EU following the changes in regulations in different countries and concludes that the perceived value of conformity marks does not necessarily outweigh the increased costs and burden associated with obtaining them. One interesting conclusion he draws is that certification organizations do not really understand how product certification is perceived by the manufacturers as part of the development process and that consumers are the ones who ultimately decide what is important to them, regardless of the authority providing the certification. Xiao (2010) analyses quality certification versus firm reputation using the childcare market as example. Their results show that a) in the case of older firms, consumers don't rely on accreditation status; b) on average, consumer behaviour is more influenced by the firm's reputation although consumers value the quality given by the conformity assessment and c) that consumers gain information from the accreditation status and this leads to a better consumer-product match.

Key to our analysis was also the Center for Strategy & Evaluation Services's (2014) evaluation of the Internal Market Legislation for Industrial Products because it provided insightful qualitative data on the regulatory framework of CE Marking.

Although sporadic efforts into analysing the impact of CE Marking could be observed, none of the aforementioned papers considers the usefulness of the conformity assessment for both the producer and the consumer. Most of the studies are either very descriptive or commissioned by public institutions which makes their conclusions largely biased. We believe our paper could contribute to the research in the field of regulation because it undertakes a mixed approach that includes a theoretical rationale that is correlated with the practicalities of introducing such a system.

3 Methodology

Our aim was to assess the utility of CE Marking and certification regulations, their benefits and their impact on costs for manufacturers, distributors, and consumers. In the preliminary documentation phase, we looked at the certification processes described by regulators from different EU countries, in order to assess the differences in how these countries apply the EU directives implementing harmonised standards.

We originally planned to look at how much time was necessary for the various steps required before a product could legally use the CE Marking, especially at those steps where a public-sector entity had to provide documentation before manufacturers and distributors could place products on the EU single market. We were not entirely successful in this step for two main reasons: a) most products do not require the validation of an institutional certification body at all, and for most of those that do the notified bodies are private entities themselves, and b) state-run regulatory and control agencies did not respond at all or did not wish to participate in our study.

We acquired data on CE Marking from 4 sources:

1. Consumers. 926 people answered a questionnaire about CE Marking.
2. Companies seeking to use the CE Marking in order to sell their products on the EU single market. 52 company representatives were interviewed.
3. CE Marking consultancy firms. Ten consultancy firms, specialising in certification assistance services, were asked to provide quotations for services associated with the production of documentation required to ensure the conformity of a hypothetical product.
4. Publicly available certification and conformity information for products that are already on the market.

Our consumer survey was designed to assess public opinion about CE Marking but also to evaluate the public's understanding of the CE Marking framework. The results of the questionnaire went through basic statistical processing in order to facilitate the presentation and comprehension of statistical information. Given our sample of 858 responders our data is statistically representative for the population of the European Union, of approximatively 512 Million, at a confidence level of 95% and with a confidence interval of no less than 3.35.

Interviews conducted with business representatives focused on obtaining qualitative information on how businesses view the CE Marking framework. Questions pertained to the feasibility of compliance with applicable EU-imposed standards, perceived benefits of the current system, for companies and consumers alike, impact on company behaviour induced by the requirements etc. After collecting responses, all answers were codified such as to enable aggregation of the data and the use of correlation tests within the dataset.

Some quantitative data was also obtained as respondents were asked to assess the amount of time and money spent on compliance procedures aimed at ensuring conformity for their products. In addition to per-company cost estimations, more quantitative data was provided by respondents as they provided answers about a small sample of the company's products, of their choice. In total, we collected cost data about 210 specific products.

The CE Marking consultancy firms that responded to our request for assistance generally provided us with several options for packages of services, delivery time estimates and costs. To make sense of the data we filtered and sorted their proposed options based on the same criteria related to output and cost thus enabling us to assess the final cost of the compliance process. This information was correlated with the quantitative cost information we had obtained from the company representatives thus validating it and improving our dataset.

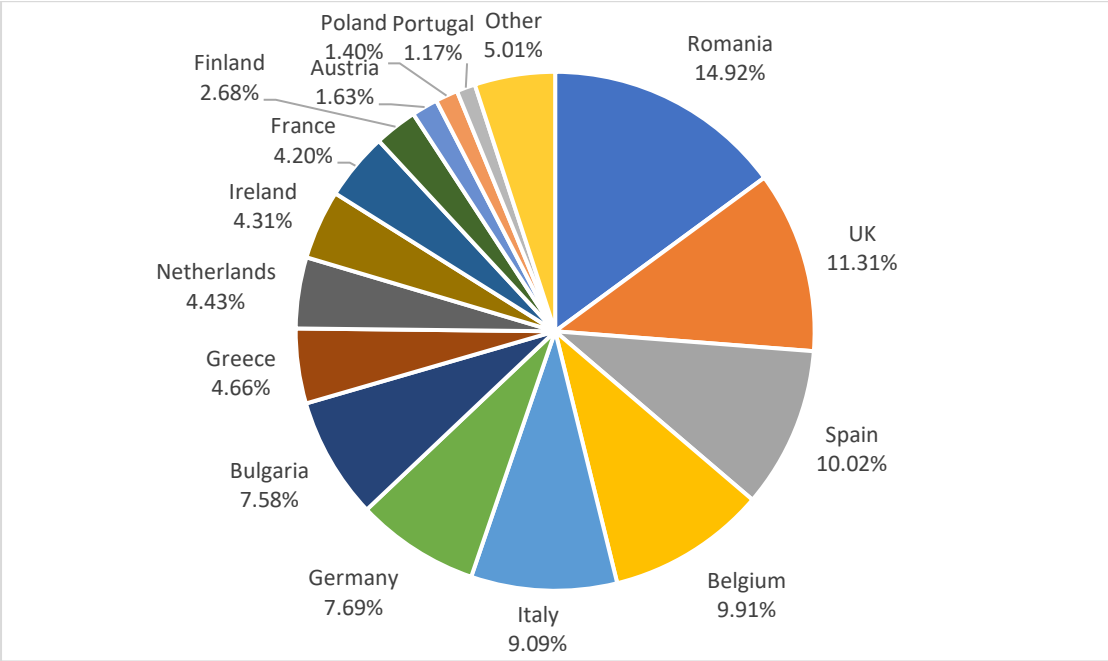
All information obtained from company representatives, through the interviews, was given to us in confidence, under the understanding that no identifiable information about the companies or their representatives would be published.

4 Findings

4.1 How Consumers View CE Marking

As part of our research we developed and deployed a questionnaire designed to determine the importance of CE Marking to EU consumers. The questionnaire was deployed using Google Forms and was generally filled in online by a random sample of EU citizens over the course of 9 months. To partially counterbalance the fact that the overwhelming majority of online responders were in the 18-34 age range some questionnaire responses were also collected in person from EU consumers aged 65+. In total we collected 926 responses. Of these, 23 responses were from people outside the EU and 45 were from underaged responders and were eliminated from the sample. Of the remaining 858 responses the largest number came from people currently residing in Romania (128), followed by the UK (97), Spain (86), Belgium (85) and Italy (78).

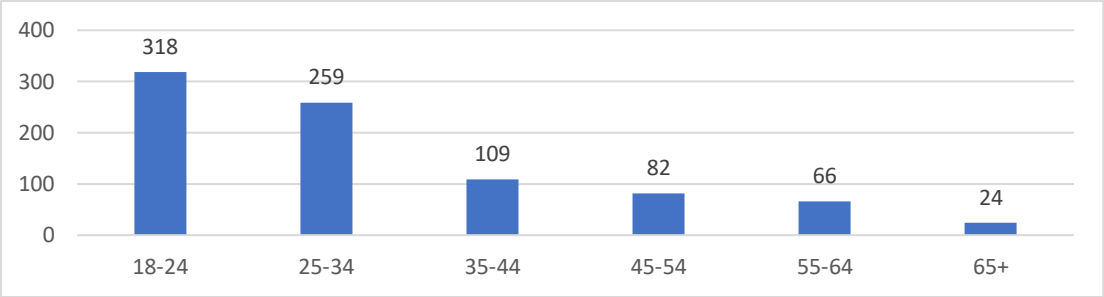
Figure 2. Consumers by Country of Residence



Source: Authors' own research

As previously mentioned, the majority of our responders were in the 18-24 age range, followed by people from the 25-34 age range. In total these two age groups accounted for 67.24% of our total number of responders.

Figure 3. Consumers by Age Group



Source: Authors' own research

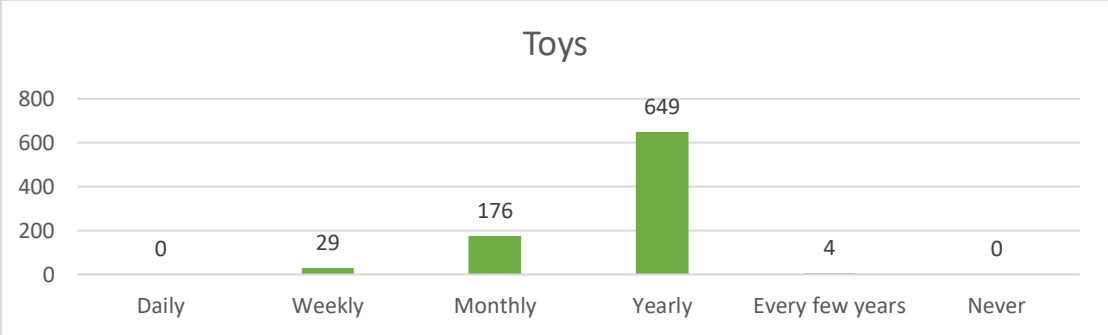
96.7% of our responders go shop for non-food products every week or at least every month. Of these, 4.4% do it daily. The remaining 3.3% only shop for non-food products once every few months.

Figure 4. Shopping Behaviour Frequency (Non Food)

Source: Authors' own research

99.5% of our responders buy toys at least once a year and, of these, 23.9% do so at least once a month.

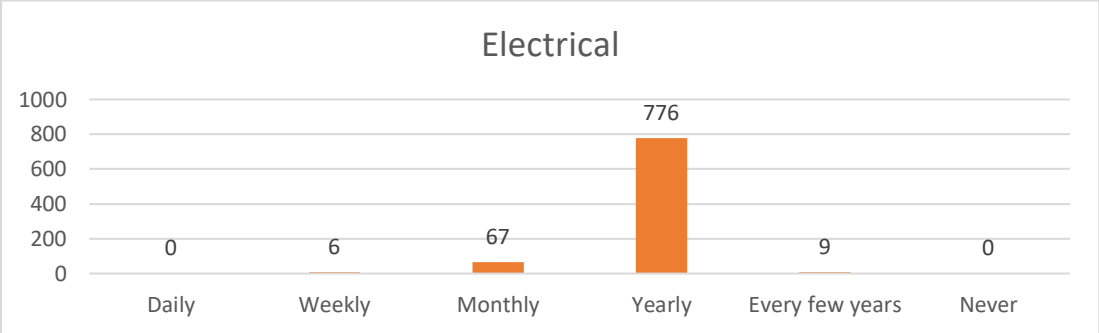
Figure 5. Shopping Behaviour Frequency (Toys)



Source: Authors' own research

99% of our responders purchase electrical equipment of some sort at least once a year and, of these, 8.5% do it at least once a month.

Figure 6. Shopping Behaviour Frequency (Electrical Equipment)



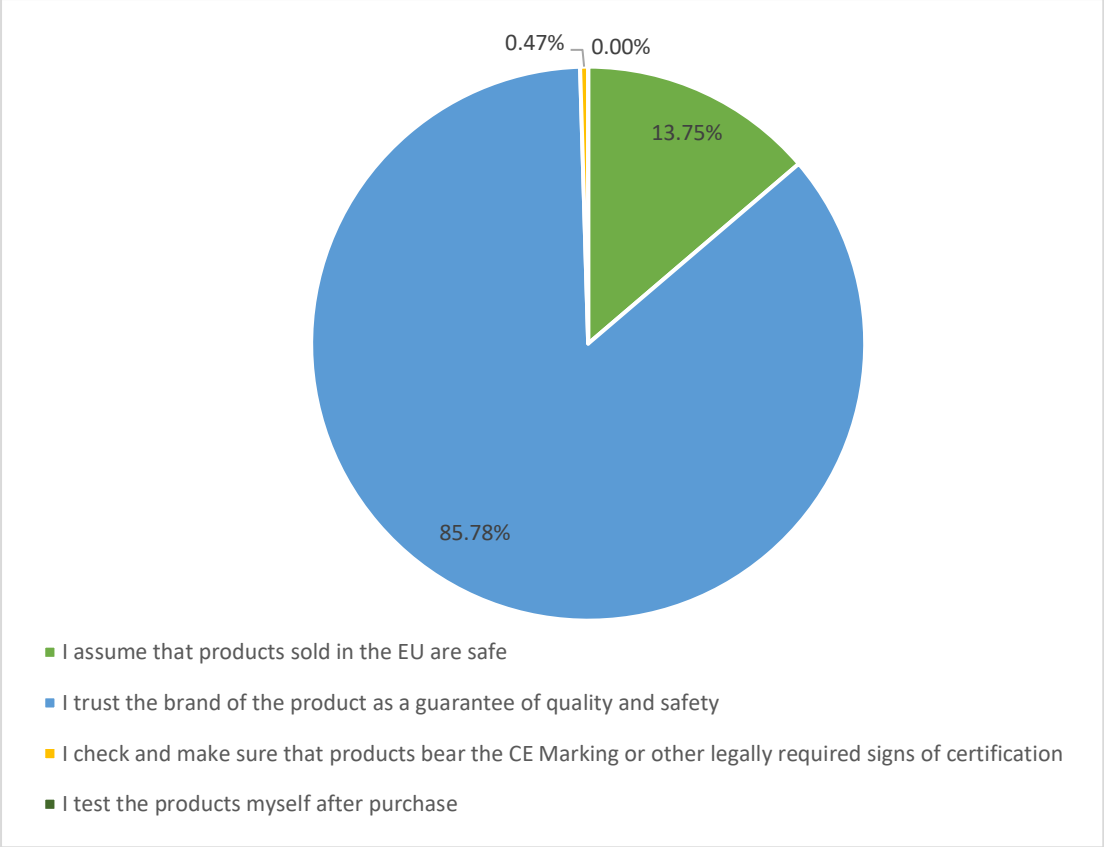
Source: Authors' own research

Consumers state that safety is an important aspect of their purchasing activities with 99.5% stating that "it is important for them to make sure that purchased products are safe for use".

30.9% of our responders said that they had previously heard about CE Marking. An important point to note is that prior to the deployment of the final questionnaire, which had the CE Marking logo next to this question, we gathered an additional 112 responses to this same question using a very short questionnaire that did not have the words "CE Marking" in the title and did not contain the logo. Only 13.4% of the responders to that questionnaire claimed to have previously heard of CE Marking.

When we asked consumers how they make sure that products are safe 13.75% said that they simply assume products sold in the EU are safe and 85.78% of responders said that they trust the brand of the product as a guarantee of quality and safety. Only 4 responders claimed that they check to make sure that products bear the CE Marking. This does not necessarily mean that consumers don't believe the CE Marking to be important, but more likely that the CE Marking is not something that consumers are aware of.

Figure 7. Consumer approach to product safety



Source: Authors' own research

89.5% of responders believe that it is important for products to be certified by a third party and marked in such a way that consumers know they are safe for use. However, 80.1% said they would be satisfied if the safety of the products was only tested by the manufacturer. The answers to these two questions show that consumers believe it is important for products to be tested before they are sold, in order to ensure that they are safe for use, but do not necessarily value third-party testing more, over testing conducted in-house by the manufacturer.

When asked if they were aware that "most products displaying the CE Marking are not required to undergo any testing conducted by third parties in order to use the mark" 99.4% said No. We believe this is indicative of the fact that consumers assume all products available on the market have undergone some form of testing.

While we were developing the consumer questionnaire, in order to determine what the important questions on the topic of CE Marking were, we conducted a small series of 12 interviews with consumers. The two main conclusions of those interviews were that, if consumers know anything about CE Marking, there is a lot of confusion with respect to what it actually means, and that consumers completely disregard the CE Marking, and product safety standard compliance in general, when making their actual purchase decisions. They claim to have knowledge of the subject and say that safety standards are important to them but largely these claims are not reflected in their purchasing behaviour.

Our assumption that product certification is perceived as useful carries some truth to it, as consumers actively stated that product certification is important to them but, in fact, it is not one of the factors that influences consumers' purchasing decision, as their behaviour shows.

Similarly, there are some issues with our assumption that certification brings value to both the producer and the consumer. Consumers feel safer due to their belief that CE marked products on the EU market adhere to strict EU standards of safety and quality. If we deem "feeling safe" to be a benefit, then EU consumers benefit from the existence of the CE Marking framework. Making any kind of case for presumed benefits to the producer is even more difficult.

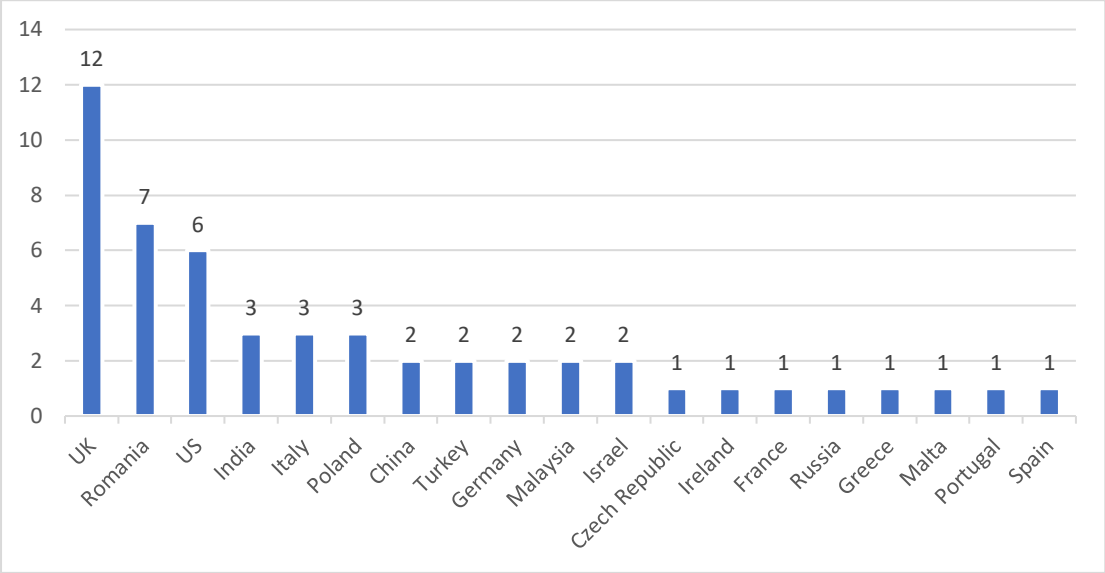
4.2 How Businesses View CE Marking

Depending on their role in the supply and distribution chain, businesses interact with the CE Marking system in very different ways. To better understand how things work in real life, we have interviewed 52 company representatives, working in both manufacturing and distribution companies, with regards to their internal processes, designed to ensure compliance with EU legislation, as well as their views on the utility and efficiency of the CE Marking framework.

In general, it was relatively difficult to convince the interviewees to answer our questions. All answers were given under the guarantee of anonymity for both the employees and the companies. Even so, given the range of responses to some questions, and the fact that it is difficult to corroborate the information with other sources, we believe that some interviewees may have overrepresented the level of adherence of their products to EU standards.

Most company representatives who were willing to answer our questions were from the UK (23%), followed by Romania (14%), the US (12%) and so on, as shown below.

Figure 8. Current country of residence of interviewees

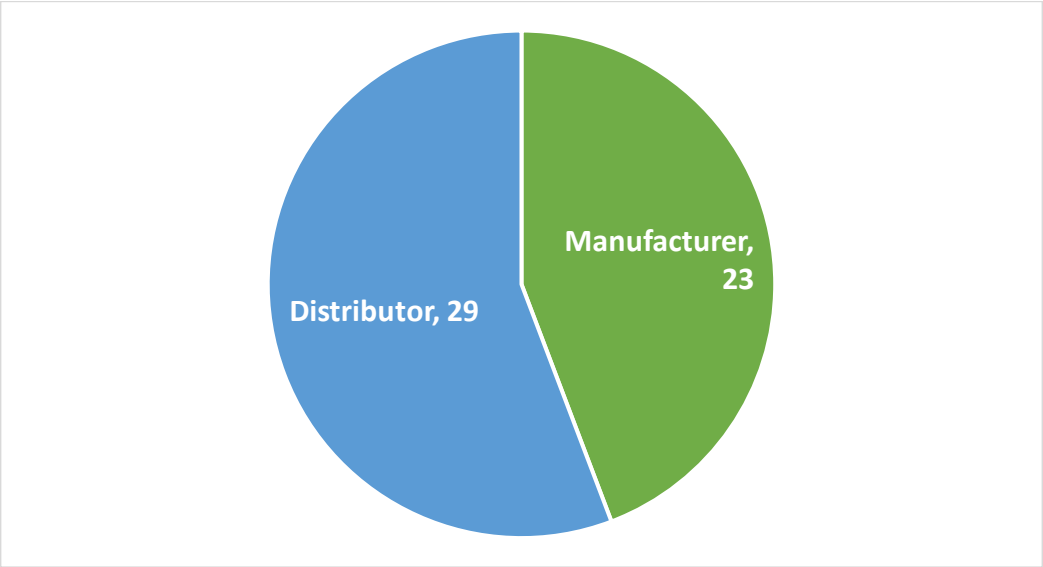


Source: Authors' own research

In terms of company roles, 23 of the interviewees were working for companies manufacturing products themselves, while 29 were working for companies distributing products manufactured by third-parties. With one exception, a single interview was conducted within each organisation. In one case we had the opportunity to interview both the Chinese representative in charge of Declarations of Conformity, working at the head office of the company in China, and the European-based representative in charge of distribution. As the two points of view were based on fundamentally different premises, they were both included in our dataset independently of one another.

It is important to note that 12 out of 52 interviewees (23%) were based outside the EU. However, since most distributors were distributing products originating outside the EU on the EU market, an estimated 75-80% of the products put on sale by the companies in our sample came from outside the EU as well.

Figure 9. Type of company that interviewees work for

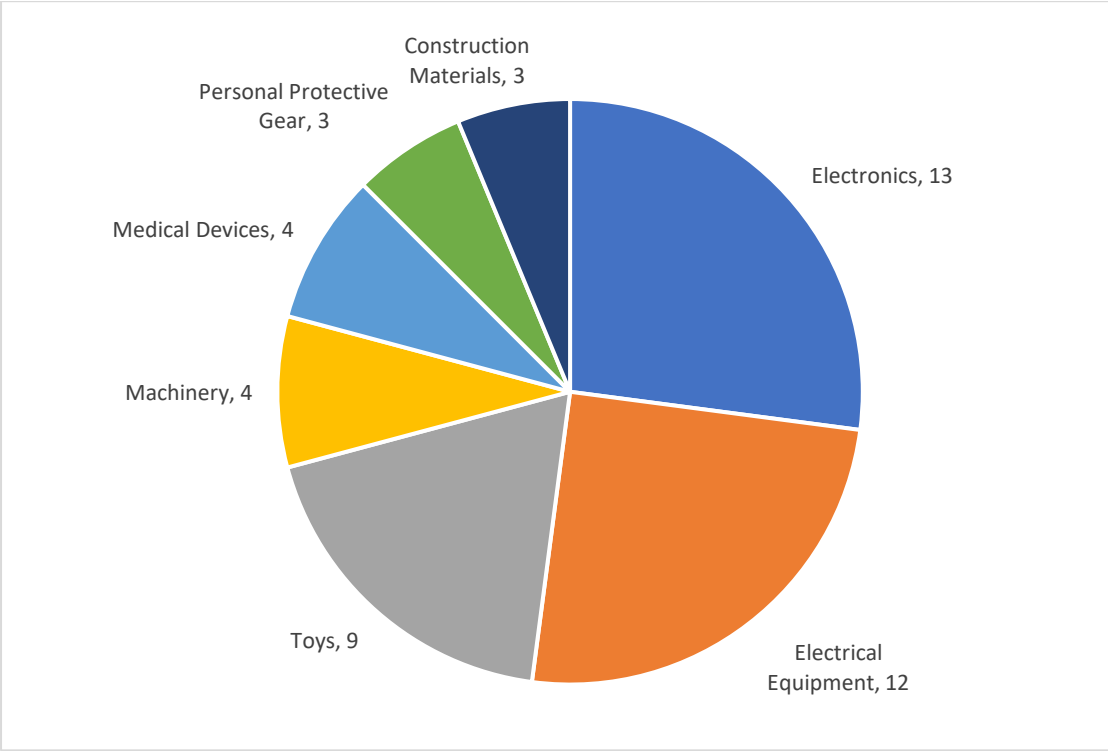


Source: Authors' own research

Upon completion of the interviews, after further examination of the legislation, and after discussing some information about the cases with CE Marking consultants from our Consultant Interview Group, we determined that the products of 7 companies whose representatives we interviewed, who were actively pursuing the CE Marking for those products, most likely did not require CE Marking. Of these 7, 4 certainly did not require it but would likely still use it on their products. When asked why they go through extra steps that aren't necessary 2 answers were that the respective companies prefer to follow the most negative interpretation of the law in order to avoid problems with merchandise blocked in customs or potential fines. One company representative said that the company paid for an expensive process to conduct the conformity assessments and produce the declaration of conformity for their original line of products, which did require the CE Marking, and they are now replicating the same procedure although the products likely do not require the CE Marking at all. Of the 7 companies mentioned, 4 were from outside the EU and 3 were EU-based.

Following the European Union's own CE Marking Guide (European Union 2018) we divided the companies into categories based on the primary type of products that they manufacture or distribute. The 4 companies whose products we were certain did not require the CE Marking were removed from this graph. An additional distinction was made between Electronics and Electrical Equipment, although these fall under the provisions of the same EU rules for the most part and are mentioned together in the EU CE Marking Guide. We decided to make the distinction because almost all of the respective interviewees clearly differentiated between the two categories. Manufacturers and distributors of Electronics were the most numerous (27%), followed by Electrical Equipment (25%), and Toys (19%).

Figure 10. Most significant product category in the companies that respondents work for



Source: Authors' own research

The general attitude towards CE Marking displayed by our interviewees was one of rigorous compliance. Only one of the companies in our sample, a manufacturing company producing electronic components, did not take the necessary steps to make their products fit for sale on the EU market. This company's products were sold to EU-based clients and used by these EU-based clients as subassemblies of their own finished goods, but it was the importers and/or manufacturers of the aforementioned finished goods that ultimately took charge of the necessary documentation to ensure conformity. While, ultimately, EU norms may be respected even in this case, based on our understanding, their approach is only borderline legal. This company's behaviour is a result of the fact that they sell no finished goods and that their market share for those highly specialised components is significant.

In assessing the cost of compliance to CE Marking-related legislation we looked at both time and monetary resources spent on ensuring conformity. Based on our interviews, the most important types of costs mentioned by interviewees were related to the following processes, in order of importance:

1. familiarisation with legislation and standards
2. in-house conformity assessment
3. translation of documentation to all EU languages
4. development and update of technical files
5. fees for mandatory testing
6. modification of product design to comply with standards
7. market withdrawal of products

The most time-consuming activity undertaken by companies in order to ensure conformity with EU Standards is the familiarisation with legislation and standards, followed by conformity assessments and translations. On average, responders stated that 23% of the time spent on compliance issues was dedicated to finding and understanding the applicable regulations. Variance within the dataset was very high with the highest percentage of time reported for this process being 40% and the lowest 10%. Manufacturing companies use on average 46% of the time they allocate to ensuring compliance for in-house conformity assessment. Distributors only spend an average 3% of that time for the same process which is why the global average was 22%. Variance in the data reported for distributors was very low with most interviewees reporting an allocation of time ranging from 1% to 5%. Variance in the data reported by manufacturers was much higher, similar to what we observed for the previous process. One company reportedly spent as much as 50% of its compliance time on in-house conformity assessments while others, which rely on external CE Marking Consulting services, reported allocating less than 10% of that time.

An important qualitative finding with regards to processes 1 and 2 was that most interviewees did not believe the size of the regulatory framework to be the primary source of cost but rather that the frequency of updates to the legislation and applicable standards was the cause of surging costs. This is consistent with findings from the Evaluation of the Internal Market Legislation for Industrial Products (Center for Strategy & Evaluation Services 2014) published by the European Commission itself. Several companies from our sample purchased expensive information packages from third parties in order to keep up with these changes. These monetary costs were added to the time cost (employee working hours and delays to market) and all company representatives found the purchases to be the only efficient way to keep up with changing regulations.

Translating product documentation to EU languages is another large cost borne by producers and distributors. For 96% of our interviewees this is a monetary cost, not a time cost, as the translation is handled by third parties. Some companies spend as much as 3000 Euro per product for this process alone. An interesting qualitative finding relating to this process was that many companies end up producing shorter product documentation to accompany the product in order to keep translation costs down. Additional resources that companies want to provide consumers are usually provided through company or product-specific websites.

Additional costs are incurred due to changing legislation and standards, as companies need to update the accompanying documentation. Many times, this also means all printed information for products already on the market that haven't been sold yet needs to be reprinted. The old documentation is usually destroyed leading to a lot of waste.

Several producer representatives believed that the tests, required by the legislation to be performed on their products during the development phase or at any time prior to the

introduction of the products to the market, are not necessarily relevant for product quality or safety. As many as 75% of the required tests are needlessly burdening product design costs, according to one interviewee, and on average 21% of tests were deemed unnecessary by all manufacturer representatives. We also found two of the manufacturer representatives whom we interviewed to be generally in favour of all tests required by EU standards. One of the two claimed they would generally perform additional tests that are not required, for purposes unrelated to product quality. Through further inquiries, we determined that the motivation behind the additional tests, and the favourable attitude towards testing, was most likely related to the fact that the companies used those tests as a form of protection against civil liability. Some companies include statistical data related to particular test results in order to transfer partial responsibility for the results of the use of the company's products to the end user. Based on the above information we can state that CE Marking generally induces behaviour that is not beneficial to the producers.

Because of the high costs associated to familiarisation with changing EU legislation and standards and because companies incur additional translation costs every time the body of regulations is updated it is quite clear that the CE Marking regulatory framework generates inefficiencies in the market. However, we must note that it is not the size of the regulation per se, as we originally assumed, but rather the frequency of changes to this body that has the greater negative impact.

We asked each company representative for estimates regarding the cost of conformity for 5 company products. Products not clearly requiring CE Marking, from the 7 companies referenced earlier, were excluded from this dataset. Of the remaining 45 companies, 3 companies provided us with estimates for only 1 product each and 1 company provided estimates for only 2 products. In total we collected estimated conformity cost data for 210 products. A distinction needs to be made here once again between producers and distributors, even where the distributor is an importer, bringing products into the EU, and bearing the same responsibility as the producer. None of the distributors in our dataset had any knowledge of the actual costs of conformity. They were able to make estimates regarding the time-cost of their own know-how of EU-legislation, or in-house conformity assessments, and, in some cases, financial and time costs of supplementary testing mandated by specific standards or regulations. As far as compliance costs are concerned, those incurred by the original producer in the design and manufacture processes, the distributors responses fell within 2 categories: they did not know, it was not their concern. We feel the second type of response is important because it is indicative of the overall approach to certification on the part of those distributors. In search of a form of disclaimer of liability they are actively trying to have as little knowledge as possible of the underlying content of procedures undertaken to ensure conformity. They only demand the required paperwork from the manufacturer and conduct no in-house assessments of their own.

Based on the responses we received from manufacturers, the average cost of CE Marking for a product[1] is 4300 Euro. This includes all associated preparatory processes, testing (if required), creation of manuals, product documentation, certificate of conformity, translations etc. Variance for this data however is extremely high as one company representative in our sample estimated conformity costs to be as high as 100000 Euro for one product. On the lower end of the scale, we found several products for which manufacturers spent less than 500 Euro for CE Marking. We found there is a direct correlation between the turnover of companies and the amount of money they spend on CE Marking. Large companies spend larger amounts, as these end up accounting for as little as 0.12% of turnover, which translates to no more than a few cents in the unit price. Things are very different for small companies or stat-ups. CE Conformity processes can take up as much as 5% of turnover, sometimes making the difference between very small profits and no profits at all for those companies.

Start-ups and small companies are also more likely to use third-party CE Marking consulting services. They are far less enthusiastic than larger companies about testing and, unlike big companies, do not participate in the development of standards for their own industry. In this respect, based on the responses we collected, we have essentially witnessed big businesses using regulation to create market-entry barriers, trying to keep small and/or new businesses out.

Distributors spend far less money on CE Marking. On average the cost of CE Marking was 1060 Euro per product for our sample. As mentioned previously, a large portion of the cost (22%) arises from the time and resources spent by employees on being up-to-date with the requirements of EU legislation and standards. All distributors spend money getting documents, manuals, and certificates translated. For some this is the most significant part of their CE Marking budget. Some register the bulk of their CE Marking expenditures while getting products through customs as compliance procedures can be very costly in some countries and as delays in getting the products on the market have a negative impact on the bottom line of the companies. In the case of some products, additional testing is required due to harmonised regulations creating far more stringent requirements in certain fields. When it comes to importers and distributors there is a lot of variety. Each product has a different story and companies will often have very different approaches. Some will spend large sums of money to ensure conformity and rapid access to the market, others will do the minimum required and will do their best to push any problems, should they occur, upstream towards the manufacturer.

The latter example can be interpreted as outlier behaviour, going against our general findings with regards to the additional costs associated to market entry that are due to the

[1] The term product is used in this context to refer to a distinct type of item intended for sale. Typically, items with different SKUs (Stock Keeping Unit codes) are considered to be different products and require separate CE Marking procedures.

CE Marking regulatory framework. Some companies find it easy to fulfil the minimum requirements for CE Marking by also minimising their efforts.

When asked about the last time they had looked into the applicable standards for the products they sell, 62% of interviewees stated they had done so when the products were first introduced to the market. With regards to the periodicity with which they review EU legislation and standards, most interviewees (79%) said they do it at least every few months. The rest do it less than once a year.

Based on the frequency with which standards are updated, and the data above, we were able to confirm that companies are encountering great difficulties while trying to keep up with the frequent changes in CE Marking legislation and standards. Companies in general do not possess up-to-date information on applicable CE Marking standards. Fewer than 10% invest enough time and money to obtain up-to-date information in near real-time.

4.3 CE Marking Consulting

CE Marking is creating business opportunities for firms that specialise in ensuring regulatory compliance. These consultancy firms will provide clients with a roadmap of actions that need to be undertaken in order to ensure conformity and will usually handle all of the actual paperwork, for a fee.

To understand what CE Marking Consulting companies have to offer we requested assistance from 10 of these companies, asking for a list of services and a quotation for price and time of delivery for all necessary documentation. 8 of the companies we contacted were European and 2 were Chinese. We received 9 offers with prices for various levels of assistance in creating the Declaration of Conformity and the accompanying documentation. The 10th company that responded to our request gave us a list of online courses that they organised so that we could learn how to self-certify our products. This result was excluded from our dataset. The average cost of the cheapest option that would provide us with a Declaration of Conformity prepared by the consultancy firm was 840 Euro. None of the options that form this average include any third-party testing. It is also worth noting that 4 companies suggested much cheaper do-it-yourself options where we, the alleged client, would prepare the documents ourselves after being provided with templates by the consultancy firm.

In addition to the aforementioned type of consultancy firm, providing compliance and conformity services, there are numerous websites that provide information about CE Marking and self-certification as part of business models designed to sell companies additional services. For example, one of these resources will go into great detail about the proper way to draw the CE Marking logo (Wellkang® Tech Consulting 2018). Many others will tell you that it's so easy "you can do it yourself without spending a cent" (Asiaimportal 2019).

5 Conclusions

In its early years, the rationale behind CE Marking was a correct one, as it started from the urge of simplifying trade across the Member States in a time where each country imposed its own quality and safety assurance regulations. The New Approach has changed the certification framework (EU Commission 2000) offering manufacturers access to the free market with a minimum level of essential requirements (Barron 2007). However, over time, regulations have become more abundant in both size and scope, while the perceived consumer importance of the CE Marking did not increase. Alternative certifications that include both national and private mechanisms kept existing and developing and manufacturers decided to acquire them too. This has led to very high costs for the producer and increased confusion for the consumer as dozens of certification marks were displayed on the products.

We started from the hypothesis that the CE Marking framework, the underlying EU legislation, the EU standards, EU-level regulations etc. represent a heavy burden on the shoulders of manufacturers, importers, distributors and, ultimately, EU consumers. While we have collected ample third-party (Center for Strategy & Evaluation Services 2014) and own data to support the fact that CE Marking costs hundreds of millions of Euros every year, we must stress the fact that the CE Marking framework has actually been an improvement over the previous situation, one in which every EU country had divergent standards, which led to even greater compliance costs. In other words, one should not draw the comparison between a system with CE Marking and a system with no regulatory framework at all, as such a framework is unlikely to ever exist again.

As far as consumers are concerned, the most important finding of our research was that consumers generally believe standards and conformity requirements to be needed and useful while, at the same time, not taking them into account when making purchasing decisions. CE Marking acts merely as a psychological assurance mechanism with regards to a product's safety, as it is perceived by the consumer as a seal of approval.

One of the first interesting findings we made, while discussing with company representatives, was that a number of companies will use the CE Marking where it is not in fact required by EU legislation. These companies are effectively using the CE Marking to try to build consumer trust and to protect themselves from potential problems along transport routes involving EU customs. While most companies are zealously following EU directives and standards, and usually doing more than the minimum required to ensure conformity, there are also those that content themselves with the minimum or even disobey EU regulations entirely.

Of all the processes leading a product to compliance, the heaviest burden is placed upon companies by the sheer amount of red tape. Companies expend vast amounts of resources getting information about the legislation currently in force and updating that

information to keep up with its frequent changes. Despite this fact, most companies generally do not have up-to-date information on the legislation applicable to their products.

Manufacturing companies spend larger amounts of time and money on complying with CE Marking requirements than import and distribution companies do. The larger a company is the larger the amount of money spent to ensure conformity for each product. At the same time, large sums spent by larger companies, with large turnovers, make up much smaller percentages of those turnovers.

CE Marking has created a big market for specialised consultancy services. Surprisingly, it's not only the big companies that choose to pay for such services. Often, it's small companies that are just starting out that decide to use the services of these consultancy firms as they lack the experience that would enable them to self-certify their products.

For some products, like medical devices or elevators, it might even make sense to have compulsory tests, that products need to pass before being put on the market. In these instances, however, companies tend to perform a lot of additional testing anyway, most likely because a company's own reputation provides a much stronger incentive for rigorous quality assurance.

The costs and disadvantages of conformity assessments largely appear to outweigh the benefits of the CE Marking framework. The CE Marking seems devoid of its fundamental meaning for both consumers and producers. Importers and distributors may be able to derive some small benefits from the harmonisation of standards at EU level, but these benefits diminish the more the legislation expands in size. It is perhaps mostly through its failings that the CE Marking benefits European consumers, businesses and the EU economy.

While it's unlikely we will see some significant simplification of the EU standards and CE Marking legislation in the foreseeable future, it's important to remember why we do the things we do. We must not lose sight of the rationale behind the system: enabling and facilitating the free movement of goods on the European single market.

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Annex 1. CE Marking Consumer Questionnaire

Many products sold in the European Union are required to comply with EU-wide standards and their compliance is generally indicated to consumers by use of a special logo (the CE Marking). This questionnaire aims to determine EU consumer views with regards to current EU certification procedures.

1. Age
2. Gender
3. Country of birth
4. Current country of official residence
5. How often do you shop for non-food products?
    a. Daily
    b. Weekly
    c. Every few weeks but at least once a month
    d. Every few months but at least once a year
    e. Every few years
    f. Never
6. How often do you purchase toys?
    a. Daily
    b. Weekly
    c. Every few weeks but at least once a month
    d. Every few months but at least once a year
    e. Every few years
    f. Never
7. How often do you purchase electrical devices?
    a. Daily
    b. Weekly
    c. Every few weeks but at least once a month
    d. Every few months but at least once a year
    e. Every few years
    f. Never
8. How often do you purchase personal protective equipment?
    a. Daily
    b. Weekly
    c. Every few weeks but at least once a month
    d. Every few months but at least once a year
    e. Every few years
    f. Never

9. How often do you purchase machinery (this can include anything from home repair electrical tools to industrial machinery)?
    a. Daily
    b. Weekly
    c. Every few weeks but at least once a month
    d. Every few months but at least once a year
    e. Every few years
    f. Never
10. How often do you purchase medical devices?
    a. Daily
    b. Weekly
    c. Every few weeks but at least once a month
    d. Every few months but at least once a year
    e. Every few years
    f. Never
11. Is it important for you to make sure that purchased products are safe for use?
    a. Yes
    b. No
12. Have you ever heard about the CE Marking?
    a. Yes
    b. No
13. How do you usually make sure products are safe?
    a. I assume that products sold in the EU are safe
    b. I trust the brand of the product as a guarantee of quality and safety.
    c. I check and make sure that products bear the CE Marking or other legally required signs of certification
    d. I test the products myself after purchase
14. Is it important for products that you purchase to be certified by a third party and to bear a mark that tells consumers they are safe for use?
    a. Yes
    b. No
15. Would it be enough for you if the safety of products was tested only internally by the manufacturer?
    a. Yes
    b. No
16. Are you aware of the fact that most products displaying the CE Marking are not required to undergo any testing conducted by third parties in order to use the mark?
    a. Yes
    b. No