OPTIONAL LAW FOR FIRMS AND CONSUMERS: AN ECONOMIC ANALYSIS OF OPTING INTO THE COMMON EUROPEAN SALES LAW

Juan José Ganuza and Fernando Gomez

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Abstract

The European Commission has launched the Regulation Proposal on a Common European Sales Law as an optional instrument for European firms and consumers. Several critical opinions have been raised against the optional nature, characterizing it as an instrument for social dumping (i. e. lowering consumer protection standards, given that no set of rules with higher levels of protection would ever be chosen by firms), as depriving consumers of any meaningful choice, and emphasizing its futility. In this paper we present a simple model showing how these critiques present theoretical flaws, even if one does not rely on the efficiency gains that increasing cross border trade may bring in terms of having more efficient firms serving consumers in other national markets. The role of verification or compliance costs, and of the impact of legal diversity on firms' operating costs is crucial for understanding the effects of an optional instrument, and may make high levels of consumer protection, and consumer choice implementable. We also characterize how different levels of the standard may lead to complete replacement of national standards and to the joint use of European and national standards.

Keywords: Legal standards, harmonization of legal rules, economic integration and trade.

JEL Codes: K13, K23, L51, H24.

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With the publication by the Commission on 11 October 2011 of the Proposal for a Regulation on a Common European Sales Law (CESL),[1] a final text is on the table that may become a codified body of EU Contract Law, even if not comprehensive enough to cover the entire domain of what may be understood as Contract Law.

The current Regulation Proposal appears as a step forward following the public consultation launched by the European Commission concerning the possible alternatives to which the result of the entire process of building a European Contract Law may be put to use. The Green Paper from the European Commission on policy options for progress towards a European Contract Law for consumers and businesses, of 1 July 2010[2] spelled out the following routes:[3] (1) The publication on the web of non-binding model contract rules which could be used in the Single Market; (2) a toolbox for current and future EU lawmakers; (3) a Contract Law Commission Recommendation that would call on EU Member States to include the European contract law instrument into their national legal systems; (4) an optional European Contract Law instrument, which could be chosen freely by consumers and businesses in their contractual relations as an alternative to the existing national contract laws for cross-border contracts, or also for domestic contracts; (5) Harmonization of national contract laws by means of an EU Directive; (6) Full harmonization of national contract laws by means of an EU Regulation; (7) the creation of a full-fledged European Civil Code, replacing all national rules on contracts. It was obvious from the outset that some of these options (a European Civil Code, full harmonization of national contract laws) were entirely unrealistic, even if they could be, which is not at all certain, true aspirations of the Commission, whereas others (model rules, tool-box for future lawmakers) would involve substantial political embarrassment and defeat for the Commission services behind the long process of European Contract Law.

After the October 2011 Proposal, it is now clear that the European Commission has expressed

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[1]COM (2011) 635 final.

[2]COM (2010) 348 final.

[3]Actually, there is an additional, option concerning the possible output of the Expert Group working over the text of the DCFR, that has been left unexpressed,and namely simply to shelve it. This seems an unlikely outcome given the clear message of wasted effort (both in political and monetary terms) that such an entirely failed result would imply.

a preference for an optional instrument, under the umbrella of a Regulation that introduces an Optional CESL (art. 3 of the Regulation Proposal).

The Optional CESL has not been delivered alone, since the harmonization effort in the field of European Contract Law has also been reinforced by the recent adoption of the Directive on Consumer Rights.[4] As is well known, the Directive Proposal stirred, due to its adoption of a full harmonization[5] approach, significant debate in policy and academic circles. In the latter, essentially, the response was strongly critical towards full harmonization route, as it would imply that pre-existing national standards – including also those more protective of consumers – would be entirely abrogated by the new European Directive, and the introduction or adoption in the future of national rules departing either way – increasing or decreasing the level of consumer protection – from the harmonized ones would also be entirely ruled out.[6] The much more modest -compared to the proposal- scope of the Consumer Rights Directive has somewhat appeased the level of negative reactions to the latter. However, the flavor of the arguments raised against full harmonization finds an important echo in the critical stances towards the optional CESL, despite the important conceptual differences between a European rule imposing maximum or full harmonization, and an optional instrument, however wide its scope.

We have previously analyzed how efficiency-minded lawmakers should set legal and regulatory standards in settings of pre-existing divergent legal systems and where building markets across national borders can be expected to produce social welfare gains.[7] We have explicitly compared

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[4] Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights [OJ 22.11.2011 L 304/64].

[5] See, Proposal of 8 October 2008 for a Directive on consumer rights, COM(2008) 614 final.

[6] See, for a non-exhaustive collection of these criticisms addressed to the full harmonization approach in this area, M. Faure, 'Towards a Maximum Harmonization of Consumer Contract Law?' (2008) Maastricht Journal of Transnational and International Law 440; P. Rottand E. Terryn, 'The Proposal for a Directive on Consumer Rights: No Single Set of Rules' (2009) Zeitschrift für Europäisches Privatrecht 460; H.W. Micklitz and N. Reich, 'Crónica de Una Muerte Anunciada: The Commission Proposal for a Directive on Consumer Rights' (2009) Common Market Law Review 471; S. Whittaker, 'Unfair Contract Terms and Consumer Guarantees: The Proposal for a Directive on Consumer Rights and the Significance of Full Harmonization' (2009) European Review of Contract Law 223; C. Twigg-Flesner and D. Metcalfe, 'The Proposed Consumer Rights Directive-Less Haste, More Thought?' (2009) European Review of Contract Law 368; J. Smits, 'Full Harmonization of Consumer Law? A Critique of the Draft Directive on Consumer Rights' (2010) European Review of Private Law 9; M. Ebers, 'De la armonización mínima a la armonización plena. La propuesta de Directiva sobre derechos de los consumidores' (2010) InDret 2/2010 at http://www.indret.com/pdf/732_es.pdf ; M. Loos, 'Full Harmonization As a Regulatory Concept and its Consequences for the National Legal Orders. The Example of the Consumer Rights Directive' (University of Amsterdam, Centre for the Study of European Contract Law, Working Paper 2010/03).

[7] See, F. Gomez and J. Ganuza, 'How to Build European Private Law: An Economic Analysis of the Lawmaking and Harmonisation Dimensions in European Private Law", in European Journal of Law and Economics (2012, forthcoming); J. Ganuza and F. Gomez, 'Optimal Standards for European Law: Maximum Harmonization, Minimum Harmonization, and Coexistence of Standards', UPF Department of Economics and Business, Working Paper

theoretically several harmonization strategies that a lawmaker may pursue to reduce barriers to cross-border trade: minimum harmonization, the traditional alternative favored by the EU lawmaker, with and without other policy measures, such as country of origin principles, to enhance opening up national markets to entry by foreign firms; maximum or full harmonization, as envisaged, e. g., by the Consumer Rights Directive Proposal; coexistence of standards, that is, the introduction of a harmonized set of rules that do not replace any of the pre-existing ones, but allow firms to trade under the former regardless of the level of standards prevailing in each of the national markets in which the firms decide to operate. Under certain conditions -non rigidities in firms' cost functions with respect to the use of more than one legal standard- the use of a coexistence of standards approach, which is equivalent to an optimal instrument that does not replace the national rules, clearly dominates any other policy alternative, including that of not harmonizing legal rules at all, in the presence of obstacles to trans-national trade.[8]

In the present paper, building upon the framework and the results of our previous papers, we try to expand our analysis by considering more in detail the conditions of use of an optional (to other, pre-existing ones) set of laws and regulations by its intended addressees, the firms and consumers interacting in the affected markets. We believe that the optional CESL provides an excellent example of such a legal instrument, and thus we believe our analysis may shed light on the factors that may induce firms and consumers to opt into the CESL.[9] Of course, we do not intend to exhaustively explore all the implications from the choice into the CESL, neither from a legal (e. g. relationship to Rome I Regulation, information to provide for informed choice) nor from an economic perspective (full characterization of equilibria under an optional instrument; generalization to different market structures and informational settings). More specifically, our aim is to provide an initial theoretical assessment of the views aired by many academic commen-

(2011); F. Gomez and J. Ganuza, 'Economic Analysis of Harmonization Regimes: Optimal Standards for European Consumer Law: Maximum Harmonization, Minimum Harmonization, or Coexistence of Standards?' 7 European Review of Contract Law (2011), p. 275.

[8]See, for a formal analysis, J. Ganuza and F. Gomez, 'Optimal Standards for European Law: Maximum Harmonization, Minimum Harmonization, and Coexistence of Standards', UPF Department of Economics and Business, Working Paper (2011), p. 19-21.

[9]As art. 8 of the Regulation Proposal makes clear, the application of the CESL requires a more (B2C) or less (B2B) explicit choice for its application to the individual contractual relationship among the parties to a contract. For a more extensive analysis of this choice, see S. Whittaker, "The Optional Instrument of European Contract Law and Freedom of Contract", European Review of Contract Law (2011), p 371; M. Loss "Scope and Aplication of the Optional Instrument"; Amsterdam Law School Legal Studies Research Paper N° 2011-14 (2011); M. Hesselink, "How to Opt into the Common European Sales Law? Brief Comments on the Commission's Proposal for a Regulation", European Review of Private Law (2012), p. 195.

tators in the European legal community that present a very dismal prospect of the consequences of having optional rules in Contract Law,[10] in B2C, but also in B2B. We will focus our analysis on B2C relations, albeit the core of our findings and implications may also apply to contracts between firms.[11]

The paper will be organized as follows: in Section II we summarize some of the critiques raised against the optional nature of the CESL or Contract Law more generally. In section III we present our main model of choice under an optional instrument. In section IV we present a discussion of some legal policy implications. Section V concludes.

2 The Claims Concerning the Consequences of an Optional CESL

Several claims are popular in the European legal literature regarding the optional nature of the CESL (or European Contract Law more generally) and the undesirable effects, at different levels, and in different degrees of severity, that will result from such a mechanism of implementing and applying the harmonizing rules. Although there are clear underlying common threads and connections –both positive and negative- between some of the claims regarding the effects of the optional character of the proposed European rules, we will present them separately, so to better assess the merits in each of them. One may organize the critical positions around three basic thesis: the social dumping idea, the deprivation of consumer's choice idea, and the thesis of the futility of the harmonization effort with optional rules.

May be the strongest and in consequential terms the more negative assessment of the CESL

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[10]A complete list of references will be provided along the way in section II. Of course, there are more favorable, or at lest less negative, views on the impact of an optional CESL: S. Grundmann and W. Kerber, "European System of Contract Laws. A Map for Combining the Advantages of Centralised and Decentralised Rule-making", in SGrundmann and J. Stuyck (eds.), An Academic Green Paper on European Contract Law, Kluwer Law International, (20029, p. 295; S. Grundmann, "The Optional European Code on the Basis of the Acquis Communautaire-Starting Points and Trends", European Law (2003), p. 215; S. Grundmann and W. Kerber, "An Optional European Contract Law Code: Advantages and Disadvantages", European Journal of Law and Economics (2005), p. 215; H. Schulte-Nölke, "EC Law on the Formation of Contract. From the Common Frame of Reference to the Blue Button", European Review of Contract Law (2007), p. 333; H. Schulte-Nölke, "The Way Forward in European Consumer Contract Law", in C. Twigg-Flesner (ed.), The Cambridge Companion to European Union Private Law, Cambridge University Press (2010), p. 142; M. Loos, "Scope and Application of the Optional Instrument", Amsterdam Law School Legal Studies Research Paper No. 2011-14 (2011).

[11]The Regulation Proposal (art. 7) provides a relatively complex set of requirements in order for the CESL to be eligible for a B2B transaction, essentially requiring that one of the parties is a small or medium-sized enterprise (SME), which will reinforce, at least in the eyes of many, the similarity of this setting to the one of a consumer contract. It is true, however, that the Regulation Proposal (art. 13 (b)) allows Member States to eliminate the personal condition of SME as pre-requisite for the choice into the CESL.

is the one that considers it a mere instrument of social dumping, that is, that the European set of rules would be a body of Law to be used -and imposed upon consumers- by firms in cross-border trade -or, if it is allowed, also in domestic transactions-[12] in order to escape higher levels of mandatory consumer protection that would otherwise be legally required of the relevant set of firms. In other words, a firm will only opt into the CESL if it erodes the level of consumer protection offered by the pre-existing national legal orders.[13] As one commentator argues: [14]"..in order to be chosen the optional instrument must include less protection than the protection provided in the national legal systems."

Therefore, the CESL will be either entirely ineffective, or else it would constitute an undesirable instrument to reduce current levels of contractual protections for consumers, levels that are assumed to be-whether correctly or incorrectly is a different matter-socially more desirable than any lower ones.

As another commentator claims:[15]"The temptation might arise to think of an alternative scenario 3, in which the standard of consumer and customer protection in the optional code would be higher than that of existing directives. But the nature of the optional code itself excludes such a scenario. As it will be the stronger parties who decide on the application or non-application of the optional code, they will never choose an optional code that protects their interests less than the otherwise applicable law."

The second line of critical stances fundamentally challenges the idea that the optional CESL may imply any meaningful choice or option to one side of the transaction, namely the consumer. There would not be even a trace of real "option" for consumers, since it is the strong party, the firm, the one who would unilaterally, and based upon its own and one-sided calculation of costs

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[12] Art. 4. of the Regulation Proposal initially limits the CESL to cross-border transactions as defined in the same provision. However, art.13 (a) allows Member States to extend the scope in order to cover domestic transactions as well.

[13] See, H. Collins, The European Civil Code, The Way Forward, Cambridge University Press (2008), p. 74; J. W. Rutgers, "Optional Instrument and Social Dumping", European Review of Contract Law (2006), p. 199; B. Lurger, "The Common Frame of Reference/Optional Code and the Various Understanding of Social Justice in Europe", in T. Wilhelmsson, E. Paunio, and A. Pohjolainen (eds.), Private Law and the Many Cultures of Europe, Kluwer Law International, (2007), p. 177; J. W. Rutgers, "An Optional Instrument and Social dumping revisited", European Review of Contract Law (2011), p. 350; R. Sefton-Green, "Choice, Certainty and Diversity: Why More is Less", European Review of Contract Law (2011), p. 134.

[14] J. W. Rutgers, "An Optional Instrument and Social dumping revisited", European Review of Contract Law (2011), p. 351.

[15] B. Lurger, "The Common Frame of Reference/Optional Code and the Various Understanding of Social Justice in Europe", in T. Wilhelmsson, E. Paunio, and A. Pohjolainen (eds.), Private Law and the Many Cultures of Europe, Kluwer Law International, (2007), p. 184.

and benefits, who would decide, and impose on the other party, whether to choose, or to waive, the optional instrument's application. The consumer would be left, at best, and depending on the nature of the goods and services, and on the market structure, with the option to contract under the optional instrument or under the other set of legal rules determined by the firm, or not to contract at all.[16] The criticism, in some cases, does not simply point at the lack of a true choice offered by a given firm to its customers between the CESL and other set of rules, most notably, the local Law of the consumer's residence[17] , so that the "optional" nature of the instrument is just one-sided and cannot be enjoyed as an actual choice by consumers. The argument goes beyond this, emphasizing what is claimed as an additional effect of net deprivation to consumers: Given that consumers are not aware of the full range of alternatives and the consequences of contracting under one or the other set of rules, they may even be deprived of the chances to look for another supplier of the same good or service in her home country, that is they will be lured away, without having a real choice, to contract under the CESL by a foreign firm on a take-it-or-leave basis.[18]

A third kind of criticism hinges upon the futility of an optional instrument in Contract Law.[19] The point, in turn, is based upon two distinct claims. The first regards the fact that legal disparities and divergences are not a important factor behind consumers' decisions to enter into contracts with a foreign firm: search and negotiating costs are essentially invariant with respect to legal factors. Thus, any harmonization effort pursued through an optional CESL is a solution for "an irrelevant or non-existent problem".[20] Second, even in the improbable case such a problem exists, the instrument deployed to try to mend it is completely moot, since inertia, statu-quo

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[16]See, J. Cartwright, "Choice is Good.' Really?", European Review of Contract Law (2011), p. 335; G. Howells, "European Contract Law Reform and European Consumer Law- Two Related But Distinct Regimes", 134; European Review of Contract Law (2011), p. 176; C. Twigg-Flesner, "Good-Bye Harmonisation by Directives, Hello Cross-Border only Regulation?' - A Way Forward for EU Consumer Contract Law", European Review of Contract Law (2011), p. 250; Walter Doralt, "The Optional European Contract Law and why success or failure may depend on scope rather than substance", Max Planck Private Law Research Paper No. 11/9 (2011); M. Loos, "Scope and Application of the Optional Instrument", Amsterdam Law School Legal Studies Research Paper No. 2011-14 (2011).

[17]Art. 6 of Rome I Regulation, for most consumer transactions with a foreign firm (not when physically shopping abroad, or actively seeking transactions in a foreign country) does not allow choice of law clauses to deprive consumers from the level of protection provided by the mandatory rules of the legal system of the country in which the consumer is domiciled.

[18]J. Cartwright, "Choice is Good.' Really?", European Review of Contract Law (2011), p. 344.

[19]See, G. Low, "The (Ir)Relevance of Harmonization and Legal Diversity to European Contract Law: A Perspective from Psychology", European Review of Private Law (2010), p. 285.

[20]G. Low, "The (Ir)Relevance of Harmonization and Legal Diversity to European Contract Law: A Perspective from Psychology", European Review of Private Law (2010), p. 303.

biases and endowment effects would make a new optional set of legal rules powerless in order to mobilize firms and consumers to switch from the sets of legal rules they are currently using to govern their economic transactions. Thus, the entire idea of an optional instrument is doomed to fail.

The two first arguments against an optional CESL essentially rest upon theoretical claims. The first one, on the claim that there cannot be an optional instrument that at the same time is attractive for firms to opt-into and offers a higher degree of consumer quality or consumer protection than existing laws of European countries. The second one relies on the theoretical point that firms will never -voluntarily, that is, unless the Law forces them to do so- operate under more than one set of rules offering consumers the choice of transacting under one or the other.

The simple model of firm's interaction with consumers under various sets of legal rules that we present in the next section actually refutes both theoretical grounds by showing that there are conditions under which an implementable European set of rules is higher than current levels of protection in national legal systems, and that firms may offer a choice of the applicable set of rules to consumers. Our model serves precisely to characterize implementable levels of "consumer quality or protection" in a European set of rules, and that can coexist, and be offered alongside, national laws. Notice that our argument here is additional to the one we had already presented in our earlier papers. In those, we had emphasized the social welfare gains arising from allowing entry of more efficient firms –that is, firms that can provide the goods and services at a lower cost than the incumbent firms at the national level- and thus satisfy the possibly divergent societal preferences for consumer protection and quality at a lower cost, thus making the introduction of higher standards an optimal choice for lawmakers. To summarize our earlier main theoretical points:

Imagine that we had two countries, A and B, with diverse firms' costs of satisfying consumer quality and protection, and also diverse consumers' preferences in the field, so that the country with the more efficient firms (assume it is country B) has consumers with weaker preferences for a higher legal standard than those of country A. Then, if A had standard a and B had standard b, the optimal joint or harmonized standard (eu) can be intermediate, but it can also be higher than a, if the population of country A is sufficiently large compared with the population of country B. That is, in this third scenario in which the preferences of consumers (or contracting parties more

generally) and the costs for firms of satisfying legal standards are positively correlated, or they are independent, the harmonized standard eu, may be:

$$eu > a > b$$

That is, it can be higher than the highest of the pre-existing standards. In more concrete terms, if one of the countries is relatively small, but has the more efficient firms, and the larger country has the consumers who care more about their legal rights, it is possible to expect an efficient harmonized standard that is larger than any of the pre-existing national ones. And this will still be true if the harmonized legal standard does not replace the existing ones, but coexists with the separate national rules and is merely optional. In fact, the optional nature of the rules, coupled with the ability of firms to operate under more than one set of legal rules allows, given the efficiency gains arising from having the most suitable firm serving the preferences for quality of the different national consumers produces that, the most efficient firms will serve consumers' preferences for quality in the best feasible way.[21]

In the present paper we do not rely on those efficiency gains as the main source producing the result of higher harmonized standards being optimal to serve diverse national markets, but on firms' savings in two sets of costs: verification or compliance costs, and costs arising from operating under several sets of legal rules, or costs of operating under legal diversity, as we may call them. These two sets of costs will be described more in detail in the following section.

As to the third line of criticism of an optional instrument, the futility thesis, it largely rests upon empirical and not theoretical grounds. The importance of legal differences for cross-border trade, and the magnitude of the real world effect of behavioral biases such as the status-quo bias or the endowment effect cannot be confirmed or refuted by theoretical analysis alone. Acknowledging this, however, some implications of our theoretical exercise may also contribute to undermine the ultimate relevance of these empirical claims.

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[21] J. Ganuza and F. Gomez, 'Optimal Standards for European Law: Maximum Harmonization, Minimum Harmonization, and Coexistence of Standards', UPF Department of Economics and Business, Working Paper (2011), p. 19-21.

3   Model

We set up a simple two-country[22] model to study the implications of an optional set of rules governing the quality or level of protection that the consumer of a good receives from the transaction. The countries are called A and B. Notice that A may represent any given EU country, while B represents the rest of the EU Member States. There are two firms that can produce the good, firm i, and firm j, one in each country.

The legal system in each country establishes a minimum level of quality or protection regarding consumer interests and rights that may be affected by the transaction to obtain the good, $q_i \geq \overline{q_i}$.

Consumers are homogenous and do not observe q_i but only $\overline{q_i}$. Given such an information structure, consumers correctly anticipate that the provided quality will coincide with the legally established level, $\overline{q_i}$.

There are three applicable sets of legal rules to determine $\overline{q}$, those of country A, those of country B, and finally the EU rules.

Firms i, j face costs of different sorts:

(i) cost of producing the good with a given level of quality –broadly understood, including the whole set of consumer rights and protection features. Firms differ in their efficiency in providing quality, as captured by an efficiency parameter β_i, so that their costs in producing the good with a given level of quality is $\beta_i q$.[23]

(ii) cost of verifying and certifying to the relevant authority (agency or court) the required compliance with the established level of quality. These verification costs would comprise both ex-ante –to any transaction or to any legal dispute- costs, including learning, internal compliance and control, legal counsel and so on, and ex-post costs, such as the costs of litigation or showing in a single case that the quality required by the applicable legal rules has been achieved.

These costs, k, will depend on the set of applicable legal rules (that is, whether the transaction is governed by the legal rules of A, of B, or of the EU), and also eventually on the authority before which verification has to take place, that is, whether it is the authorities of the local or the foreign

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[22]To generalize a two-country model to an n-country model would be mathematically tedious, but would not add much to the main insights that can be gained by using the much simpler setting we have chosen.

[23]We assume linear cost functions for simplicity. A previous version of the model delivers the same results assuming convex costs, $\frac{\beta_i q}{2}$.

market for the firm, or the EU authorities.

(iii) costs of operating under more than one set of legal rules that establish quality, which we may label operating legal diversity costs.

The underlying idea is that producing, marketing and selling goods under more than one set of legal rules may impose costs on the firms, in addition to those of producing the targeted level of quality and verifying to the authorities compliance with the established level. In other words, operating subject to more than one legal standard may increase the costs of doing business for any given level of quality provided to consumers. The most obvious reason behind these increased operating costs are rigidities in production technologies, that make them non-adaptable to different legal standards, or at least adaptable only with relevant costs, and economies of scale in producing, marketing and selling under one governing legal standard.

These costs will not be uniform across all dimensions affected by the legal rule. In fact, one would expect that the costs will vary significantly depending on the features or elements of the firm's operations that are influenced by the reach of the legal standard. For instance, if the legal rule directly or indirectly (through a long minimum mandatory warranty period) determines product durability, the extra cost of observing a second set of rules on durability is presumably very high, since it requires adapting production of the good to two different minimum durability levels. On the other side, for some other dimensions the cost will be modest, or even negligible, because diversity in applicable rules would hardly touch the firm's operations. Think for instance, of the interest rate that the firm would be allowed to collect from the buyer if the latter delays payment. If country A has a limit of 5% over EURIBOR for this type of interest rate, and country B allows for a slightly higher margin of 6%, the impact on the firms' operating costs is likely to be very limited.

It is also natural to expect that the effect of legal disparities on operating costs will also depend on the magnitude of the differences across applicable legal systems. If the substance of the rules is only slightly different, the impact on operating costs can be anticipated to be small, and to increase in the size of such substantive differences. Using the example provided above, if one country imposes a minimum warranty of 24 months and the other of 25 months, the effect on the operating costs will be smaller than if the first has a mandatory warranty period of 1 year and the second has one of 5 years.

Thus, these disparity-based operating costs, D will depend on δ, a parameter that measures the elasticity of firms' operating costs with respect to the application of different sets of legal rules, and on d, the distance between the substantive levels of quality established by each set of rules under which the firm is operating. At a general level, one would expect D to be increasing and convex and probably on both δ and d.

We will assume that firms i, j are symmetric in costs (ii) and (iii) but differ in the efficiency production parameter β. That is, there are no advantages across firms in verification costs – although there may be differences in costs when a given firm i is the most efficient firm.

Also, in order to concentrate on the interesting case in which cross-border trade takes place, and to rule out equilibria with autarky and full separation of both markets, we assume that the most efficient firm does not prefer to stay out of the foreign market, that is, if we label $R(i)$ as the revenue from serving market i , the assumption will be:

$$R(a) + \beta_i q \leq R(a) + R(b) + \beta_i \overline{q}_{EU}$$

3.1   Equality of verification and legal diversity costs

Initially and to present our results in the simplest possible setting, we will assume that verification costs are the same for firms i, j regardless of the set of applicable legal rules (that is, whether the transaction is governed by the legal rules of A, of B, or of the EU), of the authorities before which verification needs to be incurred by the firm, and also do not vary with the level of the legally required standard, $\overline{q}$. Moreover, we assume that the legal diversity cost are also constant and equal to D, provided that the firm operates under more than one standard, i.e $\overline{q}_B \neq \overline{q}_A$, $D(\delta, d(\overline{q}_B - \overline{q}_A)) = D$. We also assume without loss of generality that $\overline{q}_B \geq \overline{q}_A$. In our graphical presentation, again without loss of generality, we normalize $\overline{q}_A$ to 0.

In such a setting, we will characterize how European Law, through an optional set of rules that firms may decide to use or not, may implement a level of quality in the requirements favouring consumers that is not below the level established by the national legal systems. We will also characterize how this European set of rules –the CESL, for instance- may also be used jointly with national rules.

The most efficient firm, if willing to serve both markets -given our assumption of invariance

of verification and legal diversity costs the less efficient firm would not be able to resist entry and keep its national market-, may decide to operate exclusively[24] under the EU set of rules, or to use the national standards, or a combination of European and national.

When using the national standards, firm i will incur costs of;

$$k + \beta_i \bar{q}_A + k + \beta_i \bar{q}_B + D(\delta, d(\bar{q}_B - \bar{q}_A)) \tag{1}$$

When using only the European standard its costs will be[25]:

$$k + 2\beta_i \bar{q}_{EU} \tag{2}$$

This implies that there is a level of $\bar{q}_{EU}^*$ (such that $(1) = (2)$) below which firm i will prefer to use the European set of rules rather than go for the two sets of national laws:

$$\bar{q}_{EU}^* = \frac{\beta_i \bar{q}_A + k + \beta_i \bar{q}_B + D(\delta, d(\bar{q}_B - \bar{q}_A))}{2\beta_i} \tag{3}$$

$$\bar{q}_{EU}^* = \frac{\bar{q}_A + \bar{q}_B}{2} + \frac{k + D}{2\beta_i} \tag{4}$$

Then, with any $\bar{q}_{EU} \leq \bar{q}_{EU}^*$, firm i strictly prefers to operate in both markets on the basis of the EU standard, rather than using the national standards. Notice that depending on the values of k and D the cut-off $\bar{q}_{EU}^*$ can be larger than both national standards or it can be located between both. Moreover, the larger are k and D, the larger is the cut-off $\bar{q}_{EU}^*$.

When the EU standard, $\bar{q}_{EU}$, replaces both national standards we say that $\bar{q}_{EU}$ is completely implementable. Another possibility, it is that firm i may prefer to incur the costs of legal diversity and extra verification costs and to serve one market with the low national standard and the

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[24]In order to clarify the effects of the EU set of rules we assume initially that, in use of the authorization provided for in art. 13 (a) of the Regulation Proposal the Member State of origin of firm i has allowed its firms and consumers to opt into the European instrument also for domestic contracts. We will later discuss the implications of the restriction –at least unless the relevant Member State decides otherwise- of the use of the CESL solely to cross-border transactions.

[25]When the firm operates in all national markets under the European set of rules we consider that verification costs are incurred only once, even if two markets are actually served. The reasons are the following: (i) the ex-ante verification costs, involving learning and internal compliance and control are obviously incurred only once; (ii) even if it is true that the CESL does not have its own enforcement system, it clearly is relying ultimately on the system of EU courts to interpret and clarify whether a certain quality level complies or not with the standard, findings that national courts may not ignore or disregard. Therefore, this ex-post European verification would cover all European markets, without the need to repeat the exercise for a new national market; (iii) even for national litigation, the use of the European standard entails significant economies of scale. In any case, in the next section we will consider how verification costs may differ.

other market with the EU standard. In other words, that $\bar{q}_{EU}$ replaces only one of the national standards (the toughest of them $\bar{q}_B$). In such a case, we say that $\bar{q}_{EU}$ is partially implementable. Notice that for partial implementation, it is a necessary condition that $\bar{q}_{EU} < \bar{q}_B$.

The interesting issue is to know for what levels of $\bar{q}_{EU}$ we can obtain complete or partial implementability. If we compare the cost incurred by firms in both situations, $\bar{q}_{EU}$ will be partially implementable if the following condition is satisfied.

$$
\begin{aligned}
k + 2\beta_i\bar{q}_{EU} &\geq k + \beta_i\bar{q}_A + k + \beta_i\bar{q}_{EU} + D(\delta, d(\bar{q}_{EU} - \bar{q}_A)) \qquad (5)\\
\beta_i\bar{q}_{EU} &\geq k + \beta_i\bar{q}_A + D
\end{aligned}
$$

Condition (10) leads to a second cut-off point $\bar{q}_{EU}^{*CI/PI} = \bar{q}_A + \frac{k+D}{\beta_i}$ such that if $\bar{q}_{EU} \geq \bar{q}_{EU}^{*CI/PI}$, firm i prefers to use both the standard of country A and the European standard to serve consumers rather than to replace both national standards by $\bar{q}_{EU}$.

In order to characterize the standard $\bar{q}_{EU}$ for which we are going to get complete or partial implementability, we need to distinguish two cases depending on the relationship $\bar{q}_{EU}^{*CI/PI}$ and $\bar{q}_B$, as shown in Figure 1. Here we present two possible level of $\bar{q}_B$ ($\bar{q}_B^L$ and $\bar{q}_B^H$) one lower and one higher than $\bar{q}_{EU}^{*CI/PI}$.

[Figure 1 around here]

Notice that the function depicted in green represents the cost of using both the European and the low national standard, and that the kink in the function occurs at the level in which this cost equals the cost of operating under both national standards. The function depicted in blue represents the cost of operating solely under the European standard. Again, the kink occurs at the point in which such cost equals the cost of operating under the two national standards. Whether the relevant kink is the low or the high one depends on whether we are in front of $\bar{q}_B^L$ or $\bar{q}_B^H$.

In the first case (shown in detail in figure 2), where $\bar{q}_{EU}^{*CI/PI} \geq \bar{q}_B$, it can be shown that $\bar{q}_{EU}^{*CI/PI} \geq \bar{q}_{EU}^* \geq \bar{q}_B$ in this case, if $\bar{q}_{EU} < \bar{q}_{EU}^*$ then we obtain total implementation. A $\bar{q}_{EU}$ higher than $\bar{q}_{EU}^*$ will not be implementable, neither completely nor partially.

[Figure 2 around here]

The second case (shown in detail in figure 3), where $\bar{q}_{EU}^{*CI/PI} < \bar{q}_B$ implies that $\bar{q}_{EU}^{*CI/PI}$ $< \bar{q}_{EU}^* < \bar{q}_B$. In this case, if $\bar{q}_{EU} \leq \bar{q}_{EU}^{*CI/PI}$ then we obtain complete implementation. If $\bar{q}_{EU} \in ($ $\bar{q}_{EU}^{*CI/PI}, \bar{q}_B]$, it will be partially implementable. Finally, $\bar{q}_{EU}$ higher than $\bar{q}_B$ will not be implementable, neither completely nor partially.

[Figure 3 around here]

Notice several important points resulting from these characterizations. First, that it may be perfectly rational for a firm to use a European set of rules with a level of protection higher than all existing national standards, thus contradicting the iron law of social dumping. Second, that depending on the values of the parameters, it may happen that a higher European standard may be fully implementable and entirely replace national standards whereas no lesser degree of implementation or substitution of pre-existing standards is feasible, and other lower standards may be implemented only partially, with full implementation requiring lower levels of the legal standards. Third, that partial implementation, implying the joint use of European and national standards is feasible, and in our present scenario of invariance of verification costs, in fact there is nothing that would prevent firms the offer to consumers of a choice between both standards. As long as the firm is already incurring the legal disparity costs –and it is worthwhile for it to incur them, given that the overall cost is lower than solely using the European rules- the fact that there are no extra verification costs makes offering consumer a choice no more costly for the firm. It is the added verification costs which could prevent the firm from offering a menu to consumers.

Table 1 summarizes the results from the analysis undertaken in this section on the decision by firms to opt into the optional Contract Law instrument in the simplest scenario of constant verification and legal disparity costs.

[Table 1 around here]

We can now turn to a brief assessment of the effects, in terms of the implementation of the optional instrument, of the rule that limits the choice of the CESL solely to cross-border transaction, thus restricting the ability of firms to use them for purely domestic contracts with local customers. As shown in Figure 4, complete implementation is obviously ruled out, which in turn influences the range of possible values of the European standard that may be –partially-

implemented. Now, when we have a low q_B, only standards that are intermediate between q_A and q_B are implementable, and the possibility of European standards higher than q_B that were implementable fully is now lost. For high qB we have the same result, and only intermediate European standards are implementable, partially, that is, together with q_A.

[Figure 4 around here]

The outcome does not seem a happy one. A European standard higher than those of the existing national sets of rules is no longer implementable. Given that firms are forced to stick to their local laws for their existing national markets, it won't be possible to have a European standard that is at the same time more protective than the current systems, and attractive enough for firms to voluntarily use in their contracts. Only intermediate standards become partially implementable, thus pushing down the level of protection that can be adopted with some possibility of success. Moreover, the restriction to cross-border trade only imposes verification costs and legal disparity costs that could be saved if firms were able to use the optional instrument in all the markets they serve, including their local market. The effects are clearly negative, showing how excessive caution in order not to raise opposition to the idea of the optional instrument may backfire by making the instrument at the same time less protective and less appealing.

3.2 *Verification and legal diversity costs differ*

There are many ways in which verification costs and legal diversity costs may differ. A natural starting point would be the case of verification costs increasing in the level of the standard and legal diversity costs increasing in the distance between the standards being used. Another possibility would be that costs are driven by the fact that the applicable standard is the local, the European or the foreign set of rules.

3.2.1 Verification costs increasing in the standard and legal diversity costs increasing in the distance between the used standards. Following the analysis of the previous section, we first analyze the case of total implementation with respect to using both national standards. When firm operates under the two national standards, it will incur costs of

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$$k(\overline{q}_A) + \beta_i \overline{q}_A + k(\overline{q}_B) + \beta_i \overline{q}_B + D(\delta, d(\overline{q}_B - \overline{q}_A)) \tag{6}$$

When using only the European standard its costs will be[26]:

$$k(\overline{q}_{EU}) + 2\beta_i \overline{q}_{EU} \tag{7}$$

This implies that there is a level of $\overline{q}_{EU}^{*I}$ (such that $(6) = (7)$) below which firm i will prefer to use the European set of rules rather than go for the two sets of national laws:

$$\overline{q}_{EU}^{*I} = \frac{k(\overline{q}_A) + k(\overline{q}_B) - k(\overline{q}_{EU}) + \beta_i \overline{q}_A + \beta_i \overline{q}_B + D(\delta, d(\overline{q}_B - \overline{q}_A))}{2\beta_i} \tag{8}$$

$$\overline{q}_{EU}^{*I} = \frac{\overline{q}_A + \overline{q}_B}{2} + \frac{k(\overline{q}_A) + k(\overline{q}_B) - k(\overline{q}_{EU}^{*I}) + D(\delta, d(\overline{q}_B - \overline{q}_A))}{2\beta_i} \tag{9}$$

Then, analysis proceeds very similarly to the previous section, there is a cut-off $\overline{q}_{EU}^{*I}$, such that if $\overline{q}_{EU} \leq \overline{q}_{EU}^{*I}$, firm i strictly prefers to operate in both markets on the basis of the EU standard, rather than using the two different national standards. As in the previous case, $\overline{q}_{EU}^{*I}$, may be larger than both national standards or it can be located between both.

Now we turn to partial implementability, that is, the possibility that the firm prefers to incur the costs of legal diversity and extra verification costs and to serve one market with the low national standard and the other market with the European. Notice that for partial implementation, it is a necessary condition that $\overline{q}_{EU} < \overline{q}_B$.

In a similar way to the previous characterization, we compare the cost incurred by firms in both situations, $\overline{q}_{EU}$ will be partially implementable if the following condition is satisfied.

$$k(\overline{q}_{EU}) + 2\beta_i \overline{q}_{EU} \geq k(\overline{q}_A) + \beta_i \overline{q}_A + k(\overline{q}_{EU}) + \beta_i \overline{q}_{EU} + D(\delta, d(\overline{q}_{EU} - \overline{q}_A)) \tag{10}$$

$$\beta_i \overline{q}_{EU} \geq k(\overline{q}_A) + \beta_i \overline{q}_A + D(\delta, d(\overline{q}_{EU} - \overline{q}_A)) \tag{11}$$

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[26]When the firm operates in all national markets under the European set of rules we consider that verification costs are incurred only once, even if two markets are actually served. The reasons are the following: (i) the ex-ante verification costs, involving learning and internal compliance and control are obviously incurred only once; (ii) even if it is true that the CESL does not have its own enforcement system, it clearly is relying ultimately on the system of EU courts to interpret and clarify whether a certain quality level complies or not with the standard,findings that national courts may not ignore or disregard. Therefore, this ex-post European verification would cover all European markets, without the need to repeat the exercise for a new national market; (iii) even for national litigation, the use of the European standard entails significant economies of scale. In any case, in the next section we will consider how verification costs may differ, and thus substantially any concern related to this feature of the model would be covered.

Switching the second inequality (equation(11)) to equality, we define a level of European standard such that the costs of total and partial implementation are the same. Notice, that the right hand is an increasing function of $\overline{q}_{EU}$. We have not made any assumption regarding the curvature of such function $D(\delta, d(\overline{q}_{EU} - \overline{q}_A))$. Linear and concave specifications will result in the same qualitative outcome that we have presented in the previous section of equality of verification and legal diversity costs. However, assuming a convex specification (which looks pausible: when the distance is very large the firm may be forced to use two very different technologies) may lead to a more complex set of relationships. Naturally, this leads to two cross point as it is illustrated in Figure 5 below. The first (or lower) cross point, $\overline{q}_L^{*CI/PI}$ has a very similar interpretation than $\overline{q}_{EU}^{*CI/PI}$ in the previous section. Lower standards than $\overline{q}_L^{*CI/PI}$ lead to prefer complete implementation over partial, whereas (locally) higher standards lead to prefer partial over total. However, if the standard is higher than the second cross point, $\overline{q}_L^{*CI/PI}$, the preferences reverse. Lower (locally) standards than $\overline{q}_H^{*CI/PI}$ lead to prefer partial implementation over complete, whereas higher standards lead to prefer total over partial.

[Figure 5 around here]

Depending on the level of $\overline{q}_B$ and its location with respect to the two cross points we will get three different cases (instead of two in the previous section). When the national standard of country B is low, $\overline{q}_B^L$, then there will be complete implementation up to $\overline{q}_{EU}^{*L}$ and no implementation for higher European standards. When the national standard of country B is intermediate between the two cross points, $\overline{q}_B^M$, then there will be complete implementation up to $\overline{q}_L^{*CI/PI}$, partial implementation between $\overline{q}_L^{*CI/PI}$ and $\overline{q}_B^M$, and no implementation for higher European standards than $\overline{q}_B^M$. When the national standard of country B is larger than the higher cross point $\overline{q}_H^{*CI/PI}$, $\overline{q}_B^H$, then there will be four regions. There will be complete implementation up to $\overline{q}_L^{*CI/PI}$, partial implementation between $\overline{q}_L^{*CI/PI}$ and $\overline{q}_H^{*CI/PI}$, total implementation between $\overline{q}_H^{*CI/PI}$ and $\overline{q}_{EU}^{*H}$ and no implementation for higher European standards than $\overline{q}_{EU}^{*H}$. Table 2 summarizes these results.

[Table 2 around here]

3.2.2 Verification costs depend on operating in the local or the foreign market.   In this setion we consider a possible scenario in which the verification costs in the local market are

lower than European verification costs, which in turn are lower than those of operating in foreign markets, i.e $k_A < k_{EU} < k_B$. For easy tractability, we assume than verification costs are constant but satisfying the previous inequality, and also that legal diversity costs are constant, $D(\delta, d(\overline{q}_B - \overline{q}_A)) = D$.

Mirroring the analysis in previous sections, there is a cut-off $\overline{q}_{EU}^{*D}$, such that if $\overline{q}_{EU} \leq \overline{q}_{EU}^{*D}$, firm i strictly prefers to operate in both markets on the basis of the EU standard, rather than using the two different national standards.

$$\overline{q}_{EU}^{*D} = \frac{\overline{q}_A + \overline{q}_B}{2} + \frac{k_A + k_B - k_{EU} + D}{2\beta_i}$$

And the cut-off between total and partial implementation is the same as in section 3.1, $\overline{q}_{EU}^{*CI/PI} = \overline{q}_A + \frac{k_A + D}{\beta_i}$. Very similarly as in section 3.1 the location of $\overline{q}_B$ with respect to the latter cut-off defines two cases. When the foreign market standard $\overline{q}_B^L$ is lower than $\overline{q}_{EU}^{*CI/PI}$, we get total implementation up to $\overline{q}_{EU}^{*D}$, and no implementation above this level. Notice that $\overline{q}_{EU}^{*D}$ is pushed up by the difference $k_B - k_{EU}$. When the standard in country B is higher than $\overline{q}_{EU}^{*D}$, we obtain three regions. If European standards are lower than $\overline{q}_{EU}^{*CI/PI}$, we obtain total implementation. European standards lying between $\overline{q}_{EU}^{*CI/PI}$ and a new cut-off $\overline{q}_{EU}^{*PI/NI} = \overline{q}_B + \frac{k_B - k_{EU}}{\beta_i}$, generate partial implementation. Finally, European standard beyond $\overline{q}_{EU}^{*PI/NI}$ are not implementable. Notice that this threshold is larger than $\overline{q}_B$ (which was the maximun implementable level with constant verification costs). Figure 6 summarizes these results below.

[Figure 6 around here]

4 IMPLICATIONS OF THE ANALYSIS

The foregoing results present several implications for the assessment of the CESL. First, that the implementation of common European contractual standards taking the form of an optional instrument allows no easy and straightforward answer. Thus, the enthusiastically optimistic and the inevitably pessimistic views are inaccurate, since implementation of CESL is complex, but is plausible for ample values of the relevant costs for the firms deciding to adopt the European rules. It is possible to predict the likelihood and mode of implementation dependending on those values.

Second, and given the previous finding, that CESL, envisaged as an opt-in set of rules (art.

3 of the Regulation proposal) is indeed implementable as an optional instrument under certain general conditions. The CESL may bring advantages even beyond the social welfare gains from allowing entry of more efficient producers into foreign markets that were currently being served by less efficient firms. These advantages have been explored by us in previous work, and we do not intend to underestimate the importance of such gains. Our point here is that even if we disregard them, the optional instrument may bring other gains, in the form of welcome reductions in verification costs and in operating costs that are influenced by legal diversity, that is, by functioning under more than one set of applicable standards.

The gloomy view about the aftermath of adopting the CESL that some European legal scholars anticipate is not a theoretical prediction. Neither the social dumping view of the CESL nor the consumers' deprivation of choice idea need happen. In fact, we had already shown that under certain conditions of entry of more efficient firms, the optimal European standards adopted as optional law may well lie above the current levels of legal protection in the Member States. Now we have shown that under certain conditions, and even when the European levels are not necessarily optimal, firms may well decide to operate -to opt-in- under a CESL with a level of consumer protection that is higher than the one they are currently facing. Savings in verification and diversity costs may induce them to do so.

As to choice, the fact that the basic decision to opt-in belongs to the firms -if a firm does not want to operate under the European rules consumers or governments cannot alter this choice- does not mean that consumers have no choice and, even less, that they will be deprived of choices they now enjoy. The CESL may well serve only -and this will be the case if no Member State makes use of the possibility granted by art. 13 (a) of the Regulation Proposal- to allow firms to serve markets they are not currently serving -and therefore allowing consumers to be served by those firms- while sticking to the local law for its home market.
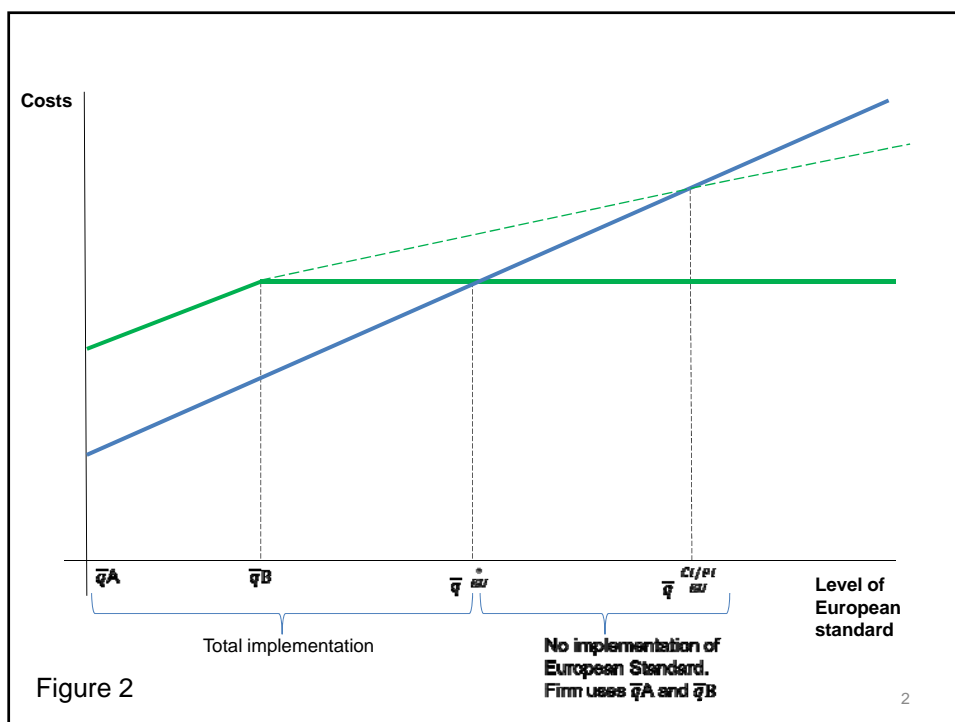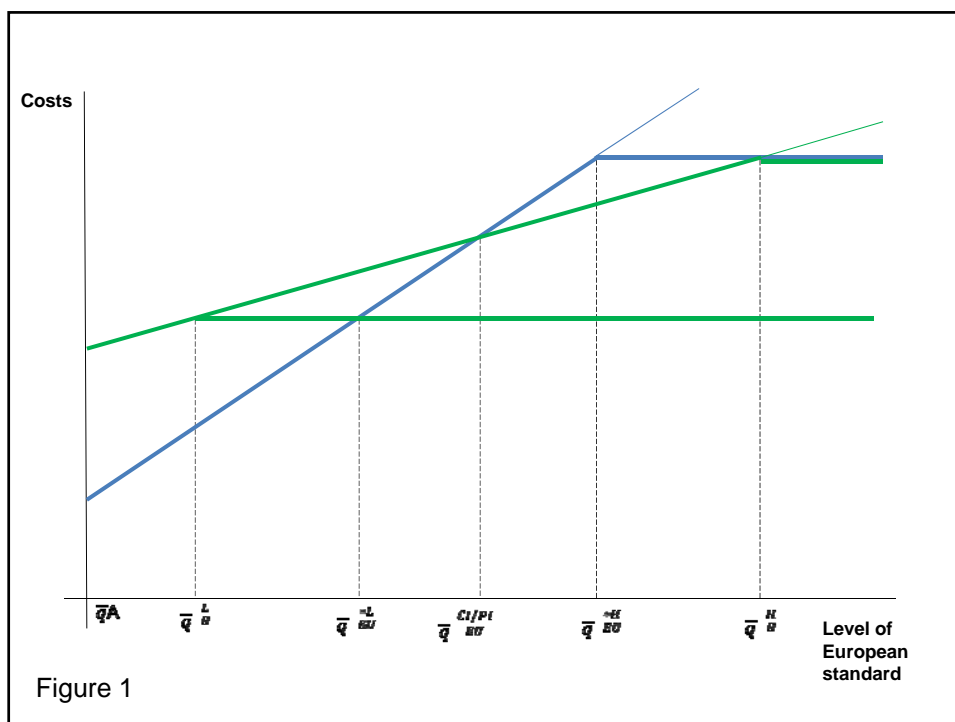
Although the level of actual use of the CESL is the object of an empirical prediction, we also conjecture that complete autarky is very unlikely to be the equilibrium outcome. When one combines the efficiency gains of lower production costs by some firms, with the savings in verification and legal diversity costs, it seems that there is at least some space for firms deciding to operate under the CESL. In fact, there are precedents in the European context of optional regimes that succesfully co-exist with national laws, when the European rules, even if more exacting than
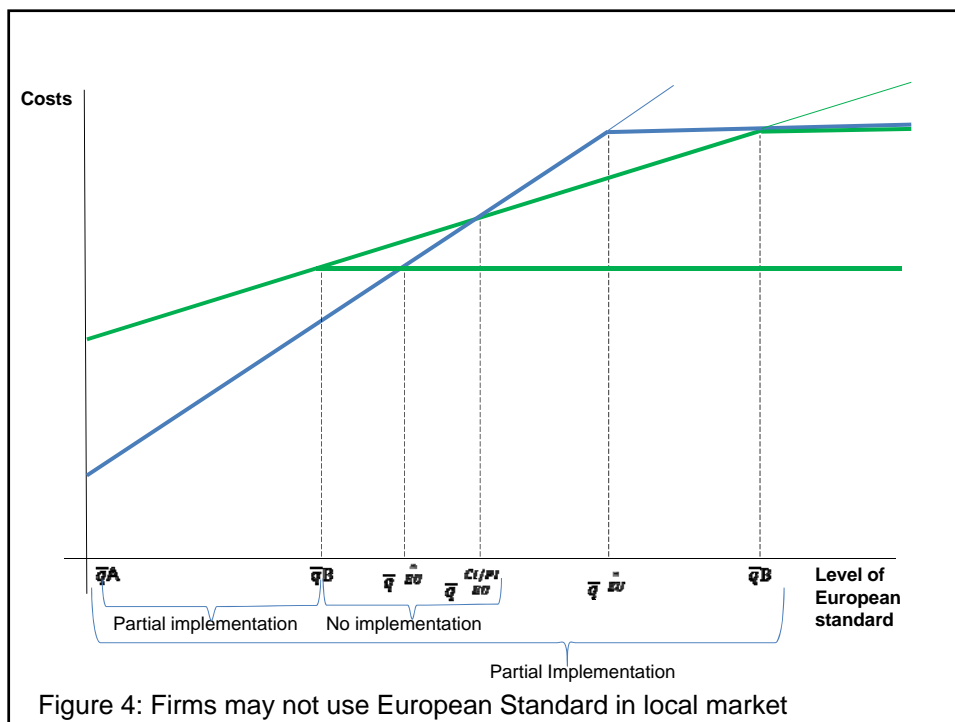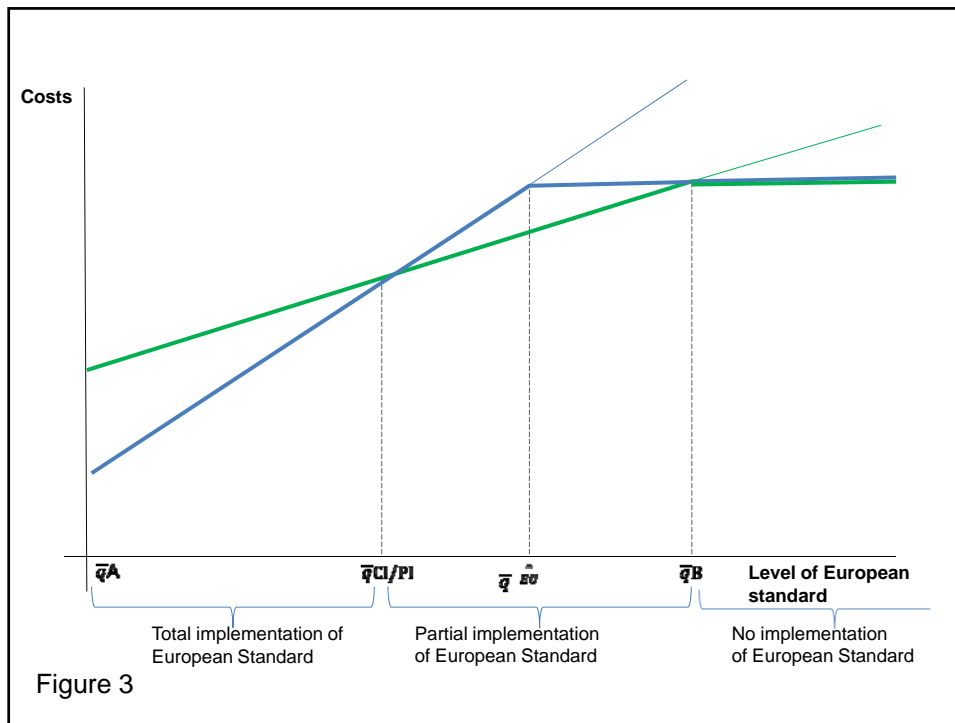
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many, if not all, pre-existing national ones, allow firms to save legal costs. This is the case of the "European" patent established by the Europan Patent Convention (EPC) of 1973. Arguably the patentability requirements under the EPC are higher than those that were in place in the various patent systems of the European countries, but this has not prevented firms from filing their applications with the European Patent Office instead of with the national patent authorities, due to the timing and cost savings brought about by concentrating examination and grant of the patent within one single European Institution.
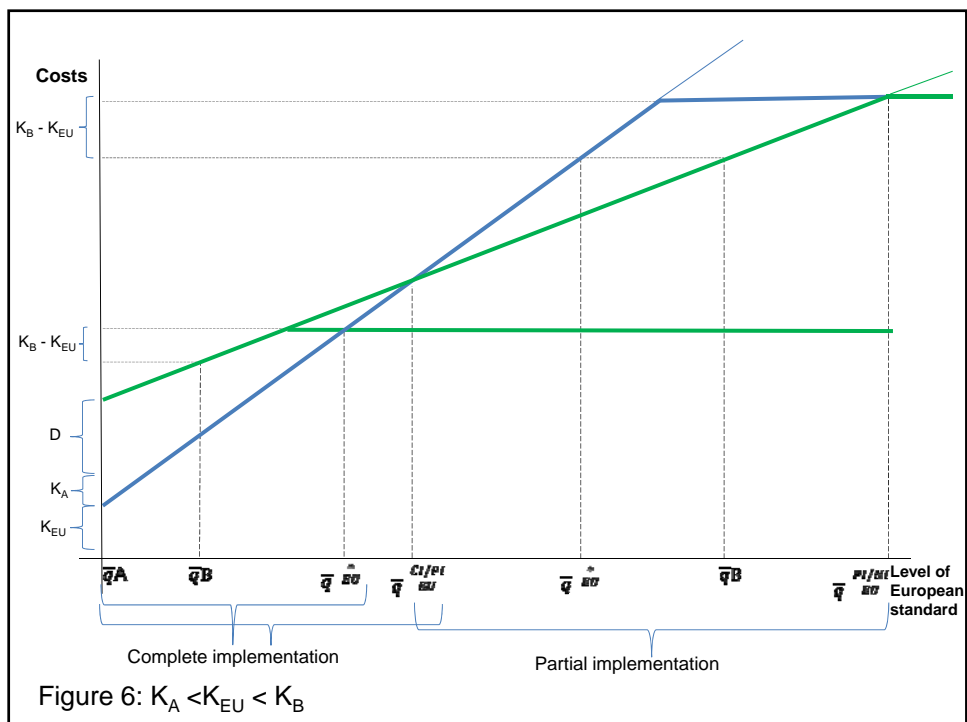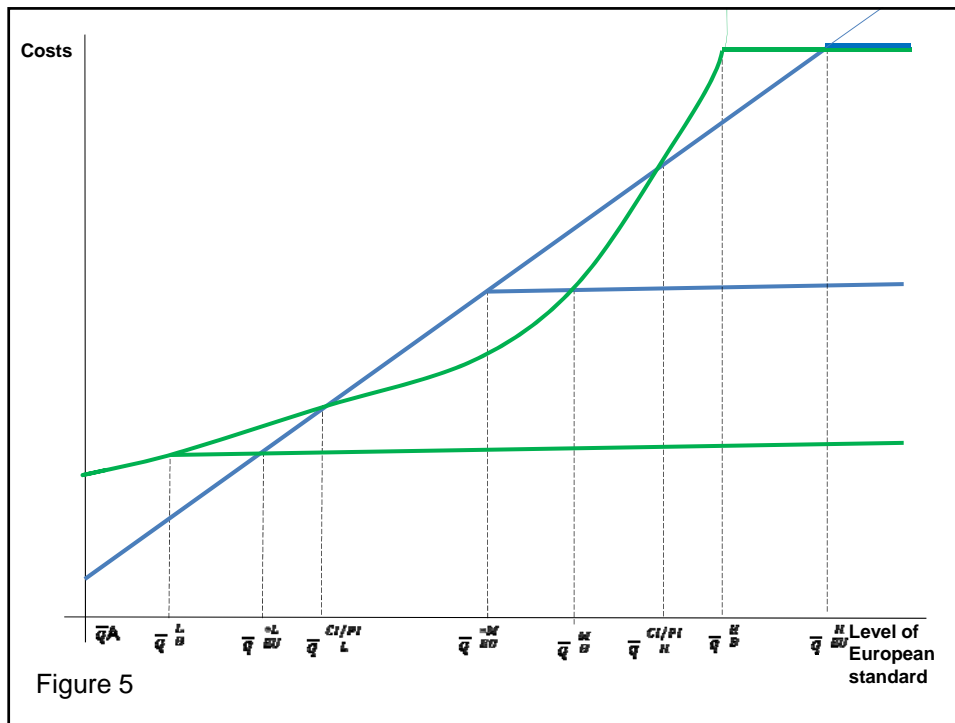
5   Conclusions

Optional laws raise more complex issues as concerns adoption and implementation than legal rules whose application is imposed upon firms or other economic agents. In this paper we have tried to show, using a simple economic model, how an optional instrument such as CESL may be voluntarily adopted by firms, depending on the level of consumer protection embodied in it, and the resulting costs, as well as other costs for the firm that the use of the harmonized set of rules may determine. In particular, we look at the costs of verifying compliance with a given level of consumer protection, and to the costs of doing business under more than one applicable set of rules or legal diversity costs. Depending on how those cost functions will be, given the level of the relevant standards (national and/or European) implementation will be feasible or not, and, in the former case, in the form of complete implementation -firms will operate solely with the European standards- or partial implementation -firms will operate with the European standards in one market and with the national standard in the other market. We characterize how the different cost function specifications will lead to different values of European standards that are completelly or partially implementable.

The simple economic analysis undertaken in the paper allows us to revisit the theoretical undepinnings of some widely shared critical views among European legal scholars about the effects of the optional instrument on Contract Law, raising doubts about the consistency of the foundations of such criticisms.

Figure 1

Total implementation

No implementation of European Standard. Firm uses $\overline{q}$A and $\overline{q}$B

Figure 2

Figure 3

Figure 4: Firms may not use European Standard in local market

Figure 5

Figure 6: $K_A < K_{EU} < K_B$

	Complete implementantion of EU Standard	Partial implementation of EU Standard	No implementation of EU Standard
Case 1 $\bar{q}_{EU}^{CI/PI} \geq \bar{q}_B$	$\forall \bar{q}EU \leq \bar{q}_{EU}^{*}$	Never	$\forall \bar{q}EU > \bar{q}_{EU}^{*}$
Case 2 $\bar{q}_{EU}^{CI/PI} < \bar{q}_B$	$\forall \bar{q}EU \leq \bar{q}_{EU}^{CI/PI}$	$\forall \bar{q}EU \in [\bar{q}_{EU}^{CI/PI}, \bar{q}_B]$	$\forall \bar{q}EU > \bar{q}_B$

Table 1 : Linear production cost and constant verification and legal diversity operation cost

	Complete implementantion of EU Standard	Partial implementation of EU Standard	No implementation of EU Standard
Case 1 $\bar{q}_{L}^{CI/PI} \geq \bar{q}_B$	$\forall \bar{q}EU \leq \bar{q}_{EU}^{*}$	Never	$\forall \bar{q}EU > \bar{q}_{EU}^{*}$
Case 2 $\bar{q}_{L}^{CI/PI} < \bar{q}_B \leq \bar{q}_{H}^{CI/PI}$	$\forall \bar{q}EU \leq \bar{q}_{L}^{CI/PI}$	$\forall \bar{q}EU \in [\bar{q}_{L}^{CI/PI}, \bar{q}_B]$	$\forall \bar{q}EU > \bar{q}_B$
Case 3 $\bar{q}_{L}^{CI/PI} < \bar{q}_{H}^{CI/PI} \leq \bar{q}_B$	$\forall \bar{q}EU \leq \bar{q}_{L}^{CI/PI}$ $\forall \bar{q}EU \in [\bar{q}_{H}^{CI/PI}, \bar{q}_{EU}^{*}]$	$\forall \bar{q}EU \in [\bar{q}_{L}^{CI/PI}, [\bar{q}_{H}^{CI/PI}]$	$\forall \bar{q}EU > \bar{q}_{EU}^{*}$

Table 2 : Convex verification and legal diversity operation costs

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