Convergence of Legal Rules: Comparing Cooperative and Non-Cooperative Processes

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Abstract

Legal scholars distinguish two modes of international legal cooperation: harmonization and unification. These cooperative choices imply more or less stringent requirements and are opposed to non cooperative, unilateral legal changes. This paper is an attempt to model these alternative modes of legal adjustments and to compare their properties regarding legal convergence. We show that all arrangements can lead to legal uniformity. We also show that decentralized processes can be better than more centralized arrangements.

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1 Introduction

1.1 Motivations

Legal discontinuities are a major source of international transaction costs (Rodrik, 2004). If progress toward economic integration is an objective, increasing standardization of the law is called for. What is the best way to standardize the law? Do we need legal cooperation or can we rely on a decentralized approach? This paper addresses theses issues.

Standardization in the legal field aims to render uniform the legal responses to the same facts or situations, irrespective of the place in which they occur or of the national elements involved. The result of this evolution is also called *legal convergence*. There exist different approaches to achieve it. Some of them are cooperative. In this respect, the legal literature distinguishes *legal harmonization* and *legal unification* (see Boele-Woelki, 2010). Harmonization of law seeks to promote coordination of different legal provisions or systems by eliminating major differences and creating minimum requirements or standards (de Cruz, 1999). Unification refers to the substitution of multiple rules by a new legislation (or the substitution of one legal rule for others). Harmonization is less requiring that unification and is often used in practice as a step towards it.

Other approaches to achieve convergence are non-cooperative, in the sense that they refer to unilateral decisions of legal change made at the nation-state level by national regulators or politicians. These methods can also refer to situations that appear apparently as more cooperative, but where countries indeed have to act unilaterally. For example, several nation-states have decided to ratify the United Nations Convention on International Sales of Good many years after 1980, the year when a diplomatic conference finalized the text in Vienna. It is clear that nation-states who ratified after 1980 have acted in a non-cooperative way as they only had to decide to ratify or not an existing text.[1].

While cooperative methods should rise the speed of legal convergence, the desirability of legal harmonization or unification over non cooperative choices is under debate. In this connection, international legal cooperation has been criticized in several ways. First,

[1] For a more general discussion, see Herings and Kanning (2008) who argue that the CISG itself is the result of a non-cooperative process.

for several authors centralized cooperative methods, in contrast to legal competition, do not preserve enough legal diversity (Sokol, 2011). Second, regulations which have been introduced by harmonization are in many cases more complex and less comprehensive than the regulations which were previously in force in nation-states (Higgs, 2000). Third, international agreements about legal rules are more subject to capture by regulators, bureaucrats, and politicians, than national choices are (Macey and Colombatto, 1996).

Other arguments supporting a skeptical view point of legal cooperation have been developed in Comparative Law. According to these arguments, legal harmonization and unification represent threats to the legal culture and the history of nation-states (Legrand, 1996, 1997). Moreover, they could also imply some specific costs of adaptation, which may make them undesirable. Even law and finance scholars arguing that common law systems perform better than their civil law counterparts explicitly recognize that it would be economically impossible for France or Germany to change their legal systems in favor of common law mechanisms for theses reasons (La Porta *et al.*, 1998).

1.2 Objectives and results

The feasibility and the desirability of coordinated methods of choice are then discussed in different literatures, but a consensus does not clearly emerge from them. An explanation for this may be that these literatures lack a common analytical framework. Indeed, they rely mostly on verbal arguments and do not use an analytical approach, which makes difficult to compare different modes of legal convergence. In this paper, we propose such a formal analysis. We compare different methods to achieve legal convergence by analyzing a model of legal choice derived from Crettez *et al.* (2013).[2] These author study the non cooperative dynamics of legal convergence, and we use this as a benchmark to analyze harmonization and unification. We then raise the following question. Does international legal cooperation always lead to superior outcomes ?

To address this question, the model we consider is a two-country model in which legal diversity is costly, as are the changes of national laws. Each country must then decide

[2]Specifically, we suppose that the preferences of law-makers are quadratic or consist in a mix of absolute value and quadratic. Clearly, our results depends on these specifications. But relying on specifications is instrumental to have complete comparisons results.

to adapt or not its legal rules. When countries act non cooperatively, they only take into account their own interest, avoiding any conflict on objectives. When they act cooperatively, they must take into account the interest of the other country. We study two different approaches of legal cooperation. The first approach is harmonization. We model legal harmonization following Carbonara and Parisi (2007). We assume that countries choose to maximize the sum of their payoffs, and by doing so bear some specific coordination costs (in this, we depart from Carbonara and Parisi, *ibid*). We also assume that the magnitude of these coordination cost decreases with the legal distance between countries. The second approach is unification. When countries choose to unify their legal systems, they cooperatively choose the same set of law (as in Loeper, 2011). This process also entails coordination costs, but the magnitude of these costs can be different than under harmonization.

Our approach differ from the literature in several respects. First, we study two possible modes of legal cooperation in the same framework. With respect to Loeper (2011), this means that nation-states can choose to harmonize and not only to unify. With respect to Carbonara and Parisi (2007), nation-states can choose to unify and not only to harmonize. In addition, endogenous coordination costs are taken into account and the comparison between the different legal arrangements is made in a dynamic framework, while a common feature of Carbonara and Parisi (2007) and Loeper (2011) is to use a static model (or limited to a two periods setting). Adopting a dynamic viewpoint is important to identify which legal arrangement is better today but also which will be so in the future. As stressed by Sokol (2011), the way international cooperation occurs often changes over time and we should explain why. In particular, we show that in some circumstances countries may never choose to cooperate. This result extends the findings of Crettez *et al.* (2013) (and Loeper, 2011) that legal unification may never be preferred to the non-cooperative process of legal change. Crettez *et al.* indeed do not consider legal harmonization, nor do they study the interesting case where preferences of law-makers consist in a mixed of absolute value and quadratic. Finally, in contrast to Baniak and Grajzl (2010) each country has perfect information about the preferences of the other states. These authors find that when countries have imperfect information about the preferences of their allies, interventionist harmonization is not justified unless there are structural asymmetries in the patterns of inter-jurisdictional linkages. Our result that non-cooperative strategies

may dominate legal coordination does not rely on imperfect information.

We use our result to interpret the recent use of more decentralized processes to achieve legal convergence in the European Union. In this connection, we pay attention to the proposal by the European Commision of introducing an optional Common European Sales Law for Europe (see, Ganuza and Gomez, 2013, Gomez and Ganuza, 2012).
We also give some rational to the use, in some circumstances, of legal unification, a special and extreme form of harmonization, to achieve legal convergence. Indeed, seeking unification *per se* can appear as a puzzle at first glance, since unification may formally always be achieved through maximum harmonization.

1.3 Organization of the paper

The paper unfolds as follows. Section 2 presents the basic setup and our model and the different legal arrangements. Section 3 analyzes the dynamics of legal convergence under these different arrangements while section 4 compares the utility obtained using the different modes of legal interactions. Section 5 examines the policy implications that can be drawn from the model. We discuss the results in section 6. All the proofs are in the appendices.

2 The Model

We will rely on a version of the dynamic model of Crettez *et al.* (2013). At each time, two countries must decide whether or not to adapt their legal systems (we imagine that there are non-overlapping generations of decision-makers with a decision-making horizon of one-period ahead of them). We will first present the objective of the countries. Then, we will discuss the costs associated to each cooperative approache to legal standardization. Finally we will define the different equilibria associated to these approaches.

2.1 Objectives

We let x_t^i denote the legal system of country i, $i = 1, 2$, at date t, with $x_0^1 \neq x_0^2$. Legal convergence occurs when the legal distance $\mid x_t^1 - x_t^2 \mid$ decreases.

We do not specify which parts of the laws become more similar. These parts can refer to administrative or private laws, and so forth. But the analysis is particularly suited to contract law, tort law, civil procedure, because legal diversity in these fields is costly (for instance because it increases the transaction costs for transfrontier trade). According to Wagner (2002), "there are different types of costs when we face the question of legal convergence. First, there are the costs for one country to change from period to period its legal rules and/or institutions. Second, there are the costs for the same country to adapt its legal system to its international environment. Third, under certain circumstances, the country has also to support coordination costs, for instance when it decides to cooperate with another country to harmonize certain legal standards".[3]

We incorporate these costs incrementally in the model. To do this we first consider two instances of the following utility function:[4]

$$\mathcal{U}_i(x_t^i, x_t^j, x_{t-1}^i) = - \mid x_t^i - x_t^j \mid^{\alpha} - \frac{\theta}{2}(x_t^i - x_{t-1}^i)^2, i, j = 1, 2, \ i \neq j, \tag{1}$$

where $\alpha \in \{1, 2\}$ and θ is a positive parameter (the higher θ, the higher the cost borne from choosing x_t^i different from x_{t-1}^i).

The first part of the above function represents the utility for country i of choosing legal system x_t^i when country j chooses legal system x_t^j. The second part represents the utility of changing legal system to x_t^i when the current one is x_{t-1}^i. Both parts capture the legal diversity costs identified by Wagner.[5]

• The case where $\alpha = 1$ corresponds to the absolute value-quadratic case in which, for $i, j = 1, 2, \ i \neq j$:

$$\mathcal{U}^i(x_t^i, x_t^j, x_{t-1}^i) = - \mid x_t^i - x_t^j \mid - \frac{\theta}{2}(x_t^i - x_{t-1}^i)^2. \tag{2}$$

[3]On the costs of legal changes, Gomez (2008) notes that legal drafting may be costly because one has to invest political capital to convince the relevant public of the virtues of the new legislation, and to overcome opposition from the interest groups who may be harmed by the legal reform, even when overall it enhances social welfare. Casella (2001) points out the existence of important the lobbying costs. Herings and Kanning (2008) highlight the costs for lawyers of learning unfamiliar legal solutions.

[4]The utility function is equal to the opposite of the sum of the costs of legal diversity and legal change.

[5]Namely, the utility is maximized when country j chooses the legal system of country i because in this case both the costs of legal diversity and of legal change are nil.

• The case where $\alpha = 2$ corresponds to the quadratic case, in which for $i, j = 1, 2,\ i \neq j$:

$$\mathcal{U}_i(x_t^i, x_t^j, x_{t-1}^i) = -\frac{1}{2}\left(x_t^i - x_t^j\right)^2 - \frac{\theta}{2}\left(x_t^i - x_{t-1}^i\right)^2. \tag{3}$$

The difference between the two instances can be explained as follows. When legal distance is low, the cost of legal diversity in terms of utility is higher with the absolute value-quadratic specification than with the quadratic one. The opposite occurs when legal distance is high. Following Wagner (2002), we now consider the coordination costs induced by legal cooperation.

2.2 Modeling coordination costs

If we consider the interactions between countries at the international level, we observe a continuum of possible legal arrangements. At one extreme, each country organizes its legal system in a non cooperative way. At the other extreme, legal choices are collectively chosen and common rules replace the national ones.

Between the two extremes of non cooperative and fully cooperative legal arrangements, there are other options that we qualify as "harmonization strategies" (in the terminology of Boele-Woelki, 2010). Legal harmonization is a less far-reaching process than unification in the sense that legal differences are less pronounced but are not eliminated. In practice, there exist several instruments to achieve harmonized and unified processes of legal changes. In the European Union, legal harmonization relies on model laws, restatements, principles, rules, and directives.

The distinctions made above raise a puzzle: why do countries choose unification to change their laws, as it appears as a special and less flexible form of harmonization? A reason that is worth considering is that coordination on legal changes across nations, especially on the local applications of commonly chosen principles, may be more difficult to realize and to monitor than trying to unify in a first place. This is because the number of alternatives which need to be considered is larger (and the higher the number of nations involved in the process, the higher the number of alternatives).[6] And even if legal unification actually results from the legal harmonization process, this may take a long time.

[6] As noted by Goldsmith and Posner (2005), the costs of coordination rise exponentially with the number of states.

On the other hand, harmonization often implies agreeing on some general principles *only*, whereas unification implies by definition setting a unique rule in all countries. Negotiating to tailor a unique rule that satisfies all countries may therefore be comparatively more difficult and lengthy than agreeing on a common set of general principles.

Notwithstanding this last remark, legal unification can dominate legal harmonization because it may be a sign of political unity, and as such, provides an extra political gain. Therefore, combining these two arguments, the net cost of unification, that is, legal coordination costs minus the possible extra benefit of fast legal convergence, could be lower than the coordination costs induced by legal harmonization. This conclusion, in our view, goes a long way to solve the puzzle of legal unification.

To account for the above discussion in the model, we now assume that countries bear coordination costs when they cooperate. and that the higher the decrease in the legal distance, the higher the coordination costs. This assumption captures the idea that to achieve a sharp reduction in the legal distance, long and costly negotiations are necessary. We also take into account that coordination costs may depend on the mode of cooperation.

Specifically, we assume that the coordination costs under legal harmonization are given by the following function $C^h(x^1_{t-1}, x^2_{t-1}, x^1_t, x^2_t) = \frac{\psi^h}{2}\big(x^1_t - x^2_t - x^1_{t-1} + x^2_{t-1}\big)^2$. We observe that when the legal status quo prevails, there are no coordination-costs at all.

Moving to legal unification, we assume that the coordination costs under this legal regime are given by the function $C^u(x^1_{t-1}, x^2_{t-1}) = \frac{\psi^u}{2}(x^2_{t-1} - x^1_{t-1})^2$. Again, when the legal status quo prevails, there are no coordination-costs.

To take into account the arguments advanced previously that the net coordination costs under unification may be lower than under legal harmonization, possibly because of an extra political benefit, we assume that $C^u(x^1_{t-1}, x^2_{t-1}) < C^h(x_t, x_t, x^1_{t-1}, x^2_{t-1})$ for all x_t, which implies that $\psi^u < \psi^h$.

Having laid out the way we model coordination costs, we can now briefly describe the three kinds of equilibria considered in this paper.

2.3 Equilibria

First, we will consider legal harmonization equilibria, which are solutions to the following problem:

$$\max_{x_t^1, x_t^2} \mathcal{U}^1(x_t^1, x_t^2, x_{t-1}^1) + \mathcal{U}^2(x_t^2, x_t^1, x_{t-1}^2) - C^h(x_t^1, x_t^2, x_{t-1}^1, x_{t-1}^2). \tag{4}$$

In this equilibrium, countries take into account the impact of their choices on the cost of legal diversity. By definition, legal harmonization does not require legal unification *per se*. Moreover, legal harmonization, as we shall see does not necessarily result in legal uniformity since it may be too costly to change the laws across countries.

Second, we will consider *de jure* legal unification equilibria, *i.e.*, legal systems x_t^u which solve the problem:

$$\max_{x_t} \mathcal{U}^1(x_t, x_t, x_{t-1}^1) + \mathcal{U}^2(x_t, x_t, x_{t-1}^2) - C^u(x_{t-1}^1, x_{t-1}^2), \tag{5}$$

and which are such that:

$$\mathcal{U}^i(x_{t-1}^i, x_{t-1}^j, x_{t-1}^i) \leq \mathcal{U}^i(x_t, x_t, x_{t-1}^i) - \frac{C^u(x_{t-1}^1, x_{t-1}^2)}{2}, \tag{6}$$

with $i \neq j,\ i, j \in \{1, 2\}$.

The last equation means that legal unification is only chosen if it is better than the status quo. We notice that when computing the utility of legal unification we have assume that countries share the coordination costs equally.

Last, we consider the case without cooperation, that is, the non-cooperative equilibria of the game where each nation-state i adapts its legal system by maximizing $\mathcal{U}^i(x_t^i, x_t^j, x_{t-1}^i)$ with respect to x_t^i only ($(i \in \{1, 2\},\ i \neq j)$. In this case, countries do not bear any coordination costs.

3 Legal Arrangements and Legal Convergence

In this section we now analyze the dynamics of legal convergence both when countries try to harmonize/unify their laws and when there is no legal coordination. We first study the quadratic case.

3.1 Example 1: The quadratic case

We will consider in turn the legal harmonization equilibrium, the legal unification equilibrium and the non-cooperative equilibrium.

• Legal Harmonization

In this case the objective is written:

$$-(x_t^1 - x_t^2)^2 - \frac{\theta}{2}(x_t^1 - x_{t-1}^1)^2 - \frac{\theta}{2}(x_t^2 - x_{t-1}^2)^2 - \frac{\psi^h}{2}(x_t^1 - x_t^2 - x_{t-1}^1 + x_{t-1}^2)^2,$$

and the legal harmonization equilibrium is given by:

$$\tilde{x}_t^i = \frac{(2 + \theta + 2\psi^h)x_{t-1}^i + 2x_{t-1}^j}{4 + \theta + 2\psi^h},\ i \neq j,\ i, j = 1, 2. \tag{7}$$

From this equation, we deduce that:

$$\tilde{x}_t^2 - \tilde{x}_t^1 = \frac{(\theta + 2\psi^h)(x_{t-1}^2 - x_{t-1}^1)}{4 + \theta + 2\psi^h}, \tag{8}$$

from which, we see that legal uniformity is always achieved in the long-run.

• Legal unification[7]

In a first step, we ignore the coordination costs and we study the following problem:

$$\max_x \left[-\frac{\theta}{2}\left(x - x_{t-1}^1\right)^2 - \frac{\theta}{2}\left(x - x_{t-1}^2\right)^2 \right].$$

The optimal value x_t^u of x is then:

$$x_t^u = \frac{1}{2}\left(x_{t-1}^1 + x_{t-1}^2\right).$$

Taking into account the coordination costs $C^u(x_{t-1}^2 - x_{t-1}^1) = \frac{\psi^u}{2}(x_{t-1}^2 - x_{t-1}^1)^2$, we find that the values of the utilities of both countries are the same and are equal to:

$$\mathcal{U}_t^u = -\frac{(\theta + 2\psi^u)}{8}\left(x_{t-1}^1 - x_{t-1}^2\right)^2. \tag{9}$$

Legal unification is only chosen, however, if it is a better choice than the status quo, where the utility level of both countries is equal to $-(x_{t-1}^2 - x_{t-1}^1)^2/2$. We can see that legal unification is better than the status quo if, and only if $\psi^u < (4 - \theta)/2$.

[7] The expressions of the legal unification equilibrium have already appeared in Crettez *et al.* (2013). In their paper, however, the possibility of the status quo was not considered.

• **Non-cooperative equilibrium**[8]

When the objective function is given by equation (**??**) the non-cooperative equilibrium at date t is given by the following expressions:

$$\overline{x}_t^i = \frac{1+\theta}{2+\theta} x_{t-1}^i + \frac{1}{2+\theta} x_{t-1}^j, \ i \neq j, \ i,j = 1,2. \tag{10}$$

The dynamics generated by the non-cooperative equilibria may be rewritten as:

$$\overline{x}_t^i = \frac{x_0^i + x_0^j}{2} - (\frac{\theta}{2+\theta})^t \frac{(x_0^i - x_0^j)}{2}. \tag{11}$$

Legal systems converge towards a long-run level equal to $(x_0^1 + x_0^2)/2$.

3.2 Example 2: The absolute value-quadratic case

We now consider the alternative utility function where the cost of legal distance is represented by the absolute value function. Moreover, we assume without loss of generality that $x_{t-1}^1 \leq x_{t-2}^2$.

• **Legal Harmonization**

It can be shown that[9]:

$$\tilde{x}_t^i = \begin{cases} \frac{x_{t-1}^1 + x_{t-1}^2}{2}, & \text{if } x_{t-1}^2 - x_{t-1}^1 \leq \frac{4}{\theta + 2\psi^h}, \\ \frac{(-1)^{1+i}2}{\theta+2\psi^h} + x_{t-1}^i, & \text{if } x_{t-1}^2 - x_{t-1}^1 \geq \frac{4}{\theta+2\psi^h}, \quad \text{i} = 1,2. \end{cases} \tag{12}$$

In the last case, we observe that:

$$\tilde{x}_t^2 - \tilde{x}_t^1 = x_{t-1}^2 - x_{t-1}^1 - \frac{4}{\theta + 2\psi^h}. \tag{13}$$

As a consequence, legal uniformity is achieved in a *finite* time (the legal distance being decreased by the amount $\frac{2}{\theta+2\psi^h}$ at each date as long as it is higher than $\frac{4}{\theta+2\psi^h}$).

• **Legal unification**

The only difference with the precedent legal arrangement is that we need to study when the status quo is the best choice. The status quo delivers a utility level equal to $-$ |

[8] The expressions of the non-cooperative equilibrium have appeared in Crettez *et al.* (2013).

[9] See appendix A for details.

$x^1_{t-1} - x^2_{t-1} \mid = x^1_{t-1} - x^2_{t-2}$ in the mixed absolute value-quadratic case. Therefore, legal unification is better than the status quo if, and only if :

$$x^2_{t-1} - x^1_{t-1} \leq \frac{8}{\theta + 2\psi^u}.$$

As in the quadratic case, legal unification is chosen only when the coordination costs are not too high.

• **Non-cooperative equilibrium**[10]

There exist two kinds of equilibria at date t (we assume without loss of generality that $\overline{x}^1_{t-1} < \overline{x}^2_{t-1}$):

- If $\overline{x}^2_{t-1} - \overline{x}^1_{t-1} < \frac{2}{\theta}$, there are multiple Nash equilibria satisfying:

$$-\frac{1}{\theta} + x^2_{t-1} \leq \overline{x}^1_t = \overline{x}^2_t \leq \frac{1}{\theta} + x^1_{t-1}. \tag{14}$$

  We will choose the case where:

$$\overline{x}^1_t = \overline{x}^2_t = \frac{\overline{x}^1_{t-1} + \overline{x}^2_{t-1}}{2}. \tag{15}$$

- If $\overline{x}^2_{t-1} - \overline{x}^1_{t-1} \geq \frac{2}{\theta}$, there is a unique Nash equilibrium where:

$$\overline{x}^1_t = \frac{1}{\theta} + \overline{x}^1_{t-1}, \tag{16}$$

$$\overline{x}^2_t = -\frac{1}{\theta} + \overline{x}^2_{t-1}. \tag{17}$$

The dynamics of legal convergence are as follows.

- If $\overline{x}^2_{t-1} - \overline{x}^1_{t-1} \leq \frac{2}{\theta}$, there is legal uniformity from date t on.
- If not, there is a finite date $t' > t$ at which legal uniformity is realized from this date on.

Legal convergence occurs in a finite time. When the distance between legal systems at date t is relatively large, legal uniformity is not a Nash equilibrium but countries are converging. The distance reduces over time, and when legal systems are close enough, legal uniformity may be a best-response for both law-makers.

[10] This equilibrium is studied in the online companion paper of Crettez *et al.* (2013). The URL of this companion paper is http://economix.fr/docs/715/Proofs.pdf.

4 Choosing Between Legal Arrangements

The comparison analysis will illustrate interesting possibilities of legal standardization. Both the examined above lead to a specific conclusion. While the quadratic case leads to clear implications, the absolute value case, which represents different assumptions about the costs of legal differences, has more mixed conclusions.

4.1 The quadratic case

After a few computations we obtain:

$$\mathcal{U}_t^{nc} = -\left[\frac{\theta\,(1+\theta)}{2\,(2+\theta)^2}\right]\left(x_{t-1}^1 - x_{t-1}^2\right)^2,$$
$$\mathcal{U}_t^{h} = -\left[\frac{(\theta+2\psi^h)}{2(4+\theta+2\psi^h)}\right](x_{t-1}^1 - x_{t-1}^2)^2,$$
$$\mathcal{U}_t^{u} = -\min\{\frac{(\theta+4\psi^u)\left(x_{t-1}^1 - x_{t-1}^2\right)^2}{8}, \frac{(x_{t-1}^1 - x_{t-1}^2)^2}{2}\}.$$

Assume first that $\psi^u = 0$. It is easy to show that we always have $\mathcal{U}_t^u < \mathcal{U}_t^{nc}$. Legal unification is therefore *never* preferred to no legal coordination[11]. This remains *a fortiori* true when $\psi^u \neq 0$. Eliminating the costs of legal distance never compensates the cost of adjusting one's legal system. It is noteworthy that this result does not depend on the weight given to the cost of changing one's legal system (*i.e.*, θ).[12]

The next result follows directly from the comparison of the values of the objectives.

Proposition 1. *In the quadratic case, if* $\frac{\theta^2}{2(4+3\theta)} < \psi^h$ *then countries always prefer not to cooperate rather than choosing legal harmonization or legal unification. Therefore, legal uniformity is achieved in the long-run only through non-coordinated legal changes.*

That ψ^h needs to be high for noncooperation to be better than legal harmonization is not surprising. Indeed, the higher ψ^h the higher the harmonization costs $\frac{\psi^h}{2}\left(x_t^1 - x_t^2 - x_{t-1}^1 +\right.$

[11] This is Proposition 3 of Crettez *et al.* (2013), which is itself implied by Proposition 3 of Loeper (2008). However, the proof of Lopeper's Proposition is also more involved.

[12] While legal unification is never preferred to legal non-cooperation, it is interesting to analyze under what conditions it is preferred to legal harmonization (assuming there is no status quo). Formally, we have: $\mathcal{U}^h < \mathcal{U}^u$ whenever $\frac{(\theta+4\psi^u)}{8} < \frac{\theta+2\psi^h}{2(4+\theta+2\psi^h)}$. Thus, the higher ψ^u the higher must be ψ^h for legal unification to be preferred to legal harmonization.

$x_{t-1}^2)^2$. What is interesting is that legal harmonization is not the best choice even when legal distance is low. Indeed, if there were no coordination costs, noncooperation would never be a strictly better choice than legal harmonization. This is because with legal harmonization countries can always choose the decisions of the non-cooperative equilibrium. When there are coordination costs, and when the legal distance is low, the value of these costs is negligible, albeit non nil. Though this situation is close to the case where there are no coordination costs, the gains of cooperation never compensate the coordination costs, however small there are. Indeed, when the legal distance is low, so are the coordination gains. And it turns out that the size of these gains is always lower than the coordination costs.

4.2 The absolute value-quadratic case

Given the assumptions and results presented in section 3.5, we have the following levels of utility:

$$\mathcal{U}_t^{nc} = \begin{cases} -\frac{\theta}{8}(x_{t-1}^1 - x_{t-1}^2)^2, & \text{if } x_{t-1}^2 - x_{t-1}^1 \leq \frac{2}{\theta}, \\ x_{t-1}^1 - x_{t-1}^2 + \frac{3}{2\theta}, & \text{if } x_{t-1}^2 - x_{t-1}^1 > \frac{2}{\theta}. \end{cases} \tag{18}$$

$$\mathcal{U}_t^{h} = \begin{cases} -\frac{(\theta+2\psi^h)}{8}(x_{t-1}^1 - x_{t-1}^2)^2, & \text{if } x_{t-1}^2 - x_{t-1}^1 \leq \frac{4}{\theta+2\psi^h}, \\ x_{t-1}^1 - x_{t-1}^2 + \frac{2}{\theta+2\psi^h}, & \text{if } x_{t-1}^2 - x_{t-1}^1 \geq \frac{4}{\theta+2\psi^h}. \end{cases} \tag{19}$$

$$\mathcal{U}_t^{u} = -\min\{\frac{(\theta+2\psi^u)}{8}\left(x_{t-1}^1 - x_{t-1}^2\right)^2, x_{t-1}^2 - x_{t-1}^1\}. \tag{20}$$

We will concentrate on the case where: $\frac{2}{\theta} < \frac{4}{\theta+2\psi^h} < \frac{8}{\theta+2\psi^u}$.[13] This case only arises when $\psi^h < \frac{\theta}{2}$ and $\psi^u < \frac{3\theta}{2}$. Under these peculiar assumptions, noncooperation is always the best choice, as shown in the following Proposition:

Proposition 2. *In the mixed absolute value-quadratic case, when $\frac{\theta}{6} < \psi^u < \psi^h < \frac{\theta}{2}$, countries always prefer to act individually and not to cooperate. Moreover, legal uniformity is achieved in finite time.*

More precisely, when the legal distance is low (*i.e.*, when $x_{t-1}^2 - x_{t-1}^1$ is lower than $\theta/2$), it never pays to cooperate. Indeed, all legal arrangements yield legal unification, but

[13] The last inequality is always satisfied since by assumption $\psi^u < \psi^h$.

because cooperating is costly it is better not to cooperate. When legal distance is high enough (*i.e.*, higher than $8/(\theta + 2\psi^u)$), all cooperative arrangements are dominated by noncooperation if $\theta/6 < \psi^h$. In effect, under this assumption legal harmonization is dominated by noncooperation because the benefits of legal cooperation are more than compensated by the costs of cooperation. Moreover, legal unification is never chosen because the status quo prevails and the later never dominates noncooperation. For legal distances in the interval $[2/\theta, 8/(\theta + 2\psi^u)]$, legal harmonization is always dominated by either noncooperation or legal unification. Noncooperation is the best choice if $\theta/6 < \psi^u$, *i.e.*, if the coordination costs $\frac{\psi^u}{2}(x^2_{t-1} - x^1_{t-1})^2$, again, are high enough.

We have some similarities with the quadratic case. Yet, there are two differences with respect to this case. First, legal uniformity is achieved in finite time. Second, legal unification is not always dominated by legal noncooperation.[14] The absolute value-quadractic case is an interesting example since every solution can be optimal. The best legal arrangement depends on the weight nations put on the costs of legal change, and on the initial legal differences between nations. Since we are in a dynamic model, the optimal mode of interaction can evolve over time. Cooperative legal arrangements imply more important legal changes but also some specific costs. Then, when legal distance is high, cooperative behavior is interesting. When legal distance is low, countries may prefer not to cooperate to save on harmonization costs.

5 Policy Implications

We have seen that cooperative legal arrangements are not necessarily the dominant strategy to realize convergence between legal systems. Our examples establish that non-cooperative approach can dominate cooperative strategies temporarily or even definitively. The creation of more cooperative frameworks of decisions has essentially an impact on the speed of convergence, but a faster convergence is not necessarily a "good thing". The more brutal form of convergence, which in our model takes the form of an immediate uni-

[14] Legal unification is preferred to legal noncooperation when the polynomial $P(\lambda) = -(\frac{\theta+2\psi^u}{8})\lambda^2 + \lambda - \frac{3}{2\theta}$ where $\lambda \equiv x^2_{t-1} - x^1_{t-1}$, take positive values. This happens if, and only if $\psi^u < \frac{\theta}{6}$. As this polynomial reaches its maximum at $\lambda = \frac{4}{\theta+2\psi^u}$, legal unification may be preferred to legal noncooperation for some initial legal distance $\lambda = x^2_{t-1} - x^1_{t-1}$ located in the interval $[\frac{2}{\theta}, \frac{8}{\theta+2\psi^u}]$.

fication of legal systems, is an optimal choice for only in some special cases. To take its time remains a valuable option for countries, and this could explain why there are some discontents in political unions when many choices are taken in harmonized or unified fashion.

Our approach seems particularly interesting to evaluate legal convergence within the European Union context. During the first decades following the ratification of the European Treaty in 1958, the *directives*, as an harmonization mechanism, were so complete and precise that there were quasi-equivalent to regulation (*i.e.*, a unification process). In practice, the choice between directives and regulations depended on the fields of law as defined by the Treaty itself.

In the eighties, significant change occurred in favor of a "minimum" harmonization, *i.e.*, a move towards a non-cooperative approach on the continuum of international legal strategies. This move corresponds to the "new approach" of directives, which only defines the "essential requirements" for Member States (see, *e.g.*, the Council Resolution of May 2005). The "new approach" means that although directives will continue to set the basic requirements, they will be limited to setting the *essential*, that is ensuring general interests. The formal introduction of subsidiarity and proportionality into policy-making by the Maastricht Treaty and later in the Amsterdam Treaty protocol is another evidence of a less controlled evolution[15].

According to our analysis the reduction of the degree of detail and prescriptiveness in the European legislation is not necessarily an inefficient way to ensure convergence of legal rules in Member States. This is because minimum harmonization or even noncooperation can be a dominant strategy. At the same time, however, as the European Commission can declare when an issue needs a regulation (*i.e.*, legal unification) rather than a directive (*i.e.*, legal harmonization), the risk of choosing the wrong strategy for legal convergence still remains.

[15]The introduction of an optional instrument is yet another evidence of this trend. See the Harmonization and optional laws item of the next section.

6 Discussion

In this section, we discuss some assumptions used in our analysis. We will address four points. The first point relates to the modelization of the costs of legal change. The second refers to the assumption that internal costs of legal change do not depend on the method of legal convergence. The third point discusses how our comparison results would change if countries had an intertemporal criterion. Finally the fourth point considers the case where legal harmonization is realized by proposing an optional law.

• Absence of endogenous switching costs

Carbonara and Parisi (2007) assume endogenous switching costs. If before cooperating, countries can increase the size of their legal switching costs, they may shift the burden of legal adaptation to their partners (by claiming that it would be too costly for them to adapt). When there are endogenous switching costs two outcomes are possible. First, legal convergence can be lower with endogenous switching costs than without (even when countries cooperate on the choice of the legal rules). Second, with endogenous switching costs, countries can be better if they do not cooperate. This is what Carbonara and Parisi (2007) call the "paradox of harmonization". Here, we disregard the possibility for a country to increase or decrease *ex ante* the value taken by the functions $\mathcal{U}^i$. In our view, this possibility is perfectly relevant in a static framework, but in a dynamic framework, with repeated interactions, it is plausible that cooperation would also extend to the choice of switching costs. This is likely to be the case since some switching costs are of a legal nature (*e.g.*, the use of national referendums as a barrier to adopt laws decided at an international level). To simplify the analysis, however, *i.e.*, to keep it one-dimensional, we leave out the possibility of endogenous switching costs.

• Invariance of internal costs of legal change with respect to the chosen method of legal convergence

In general, internal costs might not be invariant to the chosen method of legal convergence (namely, functions $\mathcal{U}^i$ might depend on whether legal changes occur through cooperative or non-cooperative methods). For instance, having legal change imposed from outside may rise nationalistic feelings, increasing the political internal costs of change (the French and Dutch rejections in 2005 of the so-called *Treaty establishing a Constitution for Europe*

are instances of this fact). This would make cooperative methods more costly. But we may also consider that coordination reduces the costs of legal change, for instance because a country can negotiate to retain rules that are very important for its citizens (like fundamental principles of law, deeply rooted in the national tradition). Moreover, changes through international coordination often lower internal political costs. Having to adopt a rule "because the EC forces us to" sometimes is an argument that cuts through political resistance to change. Therefore, the relevance of the results of this paper is limited to the cases where these kind of benefits/costs of international coordination are limited.

• Comparison of the alternative legal regimes with an intertemporal criterion

An alternative assessment of the different methods to achieve legal convergence can be made by comparing the sum across times of the values taken by the utility functions. If a legal arrangement is preferred to another one and achieves legal convergence more quickly, such regime will remain the best using the intertemporal criterion. The interesting case arises when the dominated regime achieves convergence earlier than the dominating one. Then, the dominated regime can be the best according to the intertemporal criterion, because even if the per-period costs are larger in the transition period, total welfare may be higher as it eliminates the costs of legal differences earlier. This last property can be satisfied with legal harmonization since the speed of convergence may be larger in cooperative regimes. This is not always the case, however, since high coordination costs can slow legal convergence. For instance in the absolute value-quadratic case the dynamics of legal distance are given by $\overline{x}_t^2 - \overline{x}_t^1 = \max\{x_0^2 - x_0^1 - t\frac{2}{\theta}, 0\}$ under noncooperation, and $\tilde{x}_t^2 - \tilde{x}_t^1 = \max\{x_0^2 - x_0^1 - t\frac{4}{\theta+2\psi^h}, 0\}$, under legal harmonization. We see that if coordination costs are high, if *i.e.*, $\psi^h > \frac{\theta}{2}$, the speed of convergence is higher with noncooperation than with legal harmonization.

• Harmonization and optional laws

In the recent period, the European Commission has launched a *regulation* proposal on a Common European Sale Law as an *optional* instrument for European firms and consumers. This proposal has been studied by Ganuza and Gomez (2013) and Gomez and Ganuza

(2012).[16] Ganuza and Gomez (*ibid*) consider a model where firms can choose between different national contract laws and an optional European law. They show that these firms can use the European contract law only, because this reduces the compliance cost and the cost of producing under different law requirements. Moreover, the European law can be better than both laws (*i.e.*, the safety requirement, or the warranty period may be higher).

The model of the present paper is more in line with the approach of Gomez and Ganuza (2012), where countries, rather than firms, choose the laws. But in fact, we can consider that when firms of a given country choose a new law, everything is as if this choice were made by the lawmakers of this country. Indeed, if in equilibrium the firms of a given country choose the optional instrument, we can say that when this country accepts the principle of the optional instrument, this acceptation is equivalent for the country to choose *directly* the content of the optional law.[17]

The main difference, however, between the models of Ganuza and Gomez (2012) and Ganuza and Gomez (2013) and our's is that we allow more choices for countries.[18] Here, the relevant choice is not only between the prevailing national laws and the optional instrument. We add indeed the possibility for countries to change their national laws in many different ways. In this respect, the case where both countries would choose an optional law is formally equivalent to a legal unification equilibrium (because there would be no reason to choose an optional instrument different from this equilibrium– except, of course, if there were multiple equilibria). In the same perspective, the case where one country chooses the legal instrument and the other country a different law is formally equivalent to our harmonization equilibrium. Therefore, our approach can take into account, at least in a first analysis, the possibility for countries to choose an optional law.

[16] Formal analysis of optional law have also been presented in Crettez and Deloche (2006), pages 206-207 and Carbonara and Parisi (2009).

[17] Of course, if there are multiple equilibria, this conclusion is less clear-cut.

[18] Another difference is that the model used by Ganuza and Gomez has attractive micro-foundations.

7 Conclusion

Since the emergence of the Nation-state, law-making has primarily been a task for national legislatures and courts. They "make" law for relatively homogeneous societies that are usually characterized by a common language and culture. As a result of increasing globalization, this is now rapidly changing. An important problem of law-making in a globalizing world is how to deal with the diversity national legal cultures.

In this paper, we have studied the dynamics of legal convergence and the comparison between different instruments of legal convergence based on cooperative or non-cooperatives strategies.

We have first shown that legal uniformity may be achieved in the long-run through whatever the way countries interact. Cooperation is then not a prerequisite to realize legal convergence.

Second, we have also shown that for many configurations legal convergence is not necessary the best way to achieve legal standardization. More cooperative arrangements essentially have an impact on the speed of convergence, but not on the fact that convergence will occur. A faster convergence, however, is not necessarily a "good thing", and in many configurations, there is no interest for countries to boost the process of convergence.

Our model can represent a first step to model the cooperative processes of legal standardization in a dynamic setting. It would be interesting to extend the analysis to the case where there are more than two countries. On the one hand non coordinated processes could be more costly, but on the other hand, coordination costs would be also higher. It would also be interesting to know if a decentralized approach can still be the best choice to achieve legal convergence. It would also be interesting to consider different ways to model legal harmonization. A promising approach could be that of Loeper (2012), who, consider the interplay of local/national discretion with federal/union directives.

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A Study of the harmonization equilibrium in the mixed absolute-value-quadratic case

One can check that the maximum of:

$$-2 \mid x_t^1 - x_t^2 \mid -\frac{\theta}{2}(x_t^1 - x_{t-1}^1)^2 - \frac{\theta}{2}(x_t^2 - x_{t-1}^2)^2 - \frac{\psi^h}{2}\left(x_{t-1}^2 - x_{t-1}^1 - x_t^2 + x_t^1\right)^2,$$

under the constraint $x_t^1 \geq x_t^2$ (and $x_{t-1}^1 \leq x_{t-1}^2$) is reached when:

$$x_t^1 = x_t^2 = x = \frac{x_{t-1}^1 + x_{t-1}^2}{2}.$$

Now, it is also easy to see that the maximum of

$$-2 \mid x_t^1 - x_t^2 \mid -\frac{\theta}{2}(x_t^1 - x_{t-1}^1)^2 - \frac{\theta}{2}(x_t^2 - x_{t-1}^2)^2 - \frac{\psi^h}{2}\left(x_{t-1}^2 - x_{t-1}^1 - x_t^2 + x_t^1\right)^2,$$

under the constraint $x_t^2 \geq x_t^1$ is reached at:

$$x_t^1 = x_t^2 = x = \frac{x_{t-1}^1 + x_{t-1}^2}{2},$$

when $x_{t-1}^2 - x_{t-1}^1 \leq 4/(\theta + 2\psi^h)$, and at:

$$x_t^1 = \frac{2}{\theta + 2\psi^h} + x_{t-1}^1,$$
$$x_t^2 = -\frac{2}{\theta + 2\psi^h} + x_{t-1}^2.$$

otherwise. Equation (**??**) follows then easily.

B Proof of Proposition ??

Proof. Let us define $\lambda \equiv x_{t-1}^2 - x_{t-1}^1$.

Let us first assume that $\frac{8}{\theta+2\psi^u} \leq \lambda$. In that case $\mathcal{U}_t^{nc} = -\lambda + \frac{3}{2\theta}$, $\mathcal{U}_t^h = -\lambda + \frac{2}{\theta+2\psi^h}$ and $\mathcal{U}_t^u = -\lambda$. Then, the non-cooperative solution is preferred to legal harmonization if, and only if:

$$-\lambda + \frac{3}{2\theta} > -\lambda + \frac{2}{\theta + 2\psi^h} \iff \frac{\theta}{6} < \psi^h. \tag{21}$$

This inequality is true by assumption. The, we readily check that noncooperation is always chosen.

Next let us assume that $\lambda \in [\frac{4}{2+\psi^h}, \frac{8}{\theta+2\psi^u}]$. Then $\mathcal{U}_t^{nc} = -\lambda + \frac{3}{2\theta}$, $\mathcal{U}_t^h = -\lambda + \frac{2}{(\theta+2\psi^h)}$ and $\mathcal{U}_t^u = -\frac{(\theta+2\psi^u)}{8}\lambda^2$.

Legal unification is preferred to non-cooperation when the polynomial $P(\lambda) = -(\frac{\theta+2\psi^u}{8})\lambda^2 + \lambda - \frac{3}{2\theta}$ where $\lambda \equiv x_{t-1}^2 - x_{t-1}^1$. This polynomial takes positive values if, and only if $\psi^u < \frac{\theta}{6}$. By assumption this is impossible. Therefore, legal noncooperation is always preferred to legal unification. We can readily check that noncooperation is preferred to legal harmonization. We then conclude that noncooperation is always preferred to the other legal arrangements.

Third, let us assume that $\lambda \in [\frac{2}{\theta}, \frac{4}{\theta+2\psi^h}]$. Then $\mathcal{U}_t^{nc} = -\lambda + \frac{3}{2\theta}$, $\mathcal{U}_t^h = -\frac{(\theta+2\psi^h)}{8}\lambda^2$ and $\mathcal{U}_t^u = -\frac{(\theta+2\psi^u)}{8}\lambda^2$.

By the same reasoning as in the preceding case, we can show that noncooperation is preferred to legal unification. Moreover, since legal harmonization is always dominated by legal unification, again, noncooperation is always chosen.

Finally, it is easy to see that when $\lambda \leq \frac{2}{\theta}$, noncooperation is never dominated by the two modes of legal cooperation. $\square$