

REGULATORY COMPETENCE ALLOCATION: THE MISSING LINK IN THEORIES OF FEDERALISM

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Over the past few decades, governance has lost its state-centric character. National or state governments are no longer the only, or the most important, players when it comes to the regulation of key issues such as climate change, the economy, consumer rights or even health care. Governance has become a fragmented activity, which involves many different, public and private, actors at various levels of government, ranging from the global to the local. Within legal scholarship, the division of powers between these regulators has been primarily discussed on the basis of case-specific constitutional legitimacy. Economic theories of federalism have provided more general guidelines for (de)centralization decisions, founded on the assumption that one actor, or governmental level, controls the entire regulatory process.

This paper sets out to show that most existing federal or multi-level governance regimes go beyond the (de)centralization paradigm: the regulatory process itself has been fragmented into distinct competences – typically, norm setting, implementation, and enforcement – which are allocated at different levels of government. Moving away from the binary choices within federalism theories, this paper develops a theory on competence allocation that combines legal and economy thought. This theory recognizes four key elements that make up existing and developing multi-level governance systems: (i) differentiation between distinct regulatory competences (rather than the generalized role of ‘policy-making’); (ii) multiple levels of public governance (rather than binary ‘(de)centralization’); (iii) a role of regulatory instruments; and (iv) dynamic interaction between governance levels and their respective competences.

Based on these elements, the ‘ideal’ allocation of competences can be determined at the hand of a normative trade-off between several policy aims. Within this paper, these aims are inspired by considerations first developed in the economic theory of federalism, namely: accommodation of heterogeneity, capture of externalities and optimizing economics of scale and/or scope. Depending on the policy problem at hand, these considerations can be substituted other policy aims such as democratic legitimacy or transparency.

[NB: The theoretical framework of competence allocation is applied to the European Union Emissions Trading Scheme. In order to limit the length of the paper, this part has been excluded from this draft – it will be discussed in the presentation.]

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The author would like to thank Giuseppe Dari-Mattiacci, Richard Stewart, Richard Revesz, Daniel Cole and Jonathan Wiener, as well as the participants of the NYU Hauser Global Fellows Forum, and the Society for Environmental Law and Economics Annual Meeting (2012) for comments on earlier versions of this paper. She would also like to thank the University of Amsterdam and the Hauser Global Scholars program of New York University School of Law (2010-11) for financial support. All the views expressed in this article and any remaining errors are the sole responsibility of the author.

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INTRODUCTION

This paper argues that existing theories of federalism and multilevel governance remain incomplete as long as they fail to expressly recognize the distinct roles of different steps within the regulatory process. Although there is a growing awareness of the fragmentation of the regulatory process over regulatory levels,¹ legal and economic theories of federalism have thus far failed to comprehensively integrate regulatory competences – specifically norm setting, implementation and enforcement – within their methodologies. This paper will show that the allocation of regulatory competences across different levels of governance is determinative in the success of a given regulatory system: regulatory competence allocation across different levels of governance may accommodate the diverging needs of the regulatory system at specific stages in the process. In doing so, it goes beyond the case-specific approach of legal scholarship, based on constitutional considerations, and adds to the economic theory of federalism by updating the assumption that the whole of the regulatory process is controlled at one governance level. The explanatory power from this approach stems from its ability to make explicit not only the role of regulatory competences within the regulatory process, but also the consequences of interactions between different regulatory agents who share the regulatory space and/or process.²

The concept of regulatory competence allocation aims to enrich a long-standing academic debate on the question as to which regulatory body, at which level of government, should carry out which regulatory function. This question has become an increasingly important part of the intellectual and political debate since the mid-eighteenth century. Inspired by Montesquieu's arguments on the virtues of the *separation* and *division* of powers, the American Founding Fathers drew strict dividing lines between the powers of the United States government and the state governments, as well as between the branches of government.³ The 1787 American Constitution provides that the United States Congress can only exercise those powers specified in the Constitution and that all other powers belong exclusively to the state governments as reserved powers: the doctrine of enumerated powers.⁴ Tocqueville considered the division of powers between the federal and state level one of the key virtues of the American legal and political system,⁵ and the federal model may be said to have inspired later systems such as the European Union, where the principle of subsidiarity strives to maintain a high level of decentralization.⁶

¹ Freedman (2011), Chowdhury and Wessel.

² Freedman (2011).

³ See Montesquieu (1748) (arguing that a separation of powers could function as a guard against tyranny).

⁴ See U.S. Constitution (1787), Article I, section 1 ("All legislative Powers herein granted shall be vested in a Congress of the United States."); Article I, section 8 (detailing 17 separate legislative powers which are expressly enumerated); the Tenth Amendment ("[t]he powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.") Cf. U.S. Constitution (1787), Article I, section 8, clause 18 (stating that Congress has the power "[t]o make all Laws which shall be deemed necessary and proper for carrying into Execution the foregoing Powers, and all other Powers vested by this Constitution in the Government of the United States, or in any Department or Officer thereof.")

⁵ Tocqueville (1835).

⁶ Within the European Union, the allocation of (legislative) competences in different policy areas is subjected to the 'subsidiarity' test which dictates that 'in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States, either at the central level or the regional or local level, but rather, by reason of the scale or effects of the proposed action, be better achieved at Union level'. See Treaty on the European Union (2008), Article 5(3).

The relative popularity of this form of government, a combination of shared and self-rule, has given rise to a rich body of economic, legal and political scholarship, which all claim the term ‘federalism’ as characteristic for their respective fields of research. Over time, great normative value has also become attached to the term. For political and legal scholars, federalism is the theory (or advocacy) of a federal political order with principles for dividing final authority between member units and common institutions. Yet within legal scholarship, drawing a comparison between the federal system of the United States and the ‘multi-level’ system of the European Union is precarious since the characterization of the European Union as a federal system continues to be rejected by some.⁷ European scholars have been keen on developing their own breed of federalism through the concept of ‘multi-level governance’, which more closely resembles a network approach to governance, rather than a hierarchical one.⁸

When viewed from the perspective of economic theory, the term ‘federalism’ becomes less of a political statement and more one of *de facto* competence division between different regulatory levels. As such, the economic theory of federalism presents a positive theory regarding the impact of (de)centralization on regulation, focusing on the efficiency of (de)centralized public good provision. That said, there is an explicit normative bias towards decentralization within the economic literature, with centralization only deemed superior in the presence of cross-boundary externalities.⁹ Some of the considerations introduced by the economic theory of federalism have become common parlance in some areas of legal scholarship engaging with federalism questions, such as the ‘race-to-the-bottom’ argument as applied in the context of environmental law.¹⁰

Part I will set out the most important economic and legal scholarship on federalism. This overview will show that existing theories of federalism may best be described as framing the question of (de)centralization as one of alternate *jurisdictions* rather than one of competences. Nevertheless, several allocation principles can be distilled from this literature, which form the basis for the discussion in the remainder of the paper. Part II moves on to show how regulatory competence allocation can be integrated within existing theories of federalism. Aside from distinguishing between different elements of the regulatory process in the form of competences (norm setting, implementation and enforcement), this Part also discusses the relevance of binary (de)centralization choices in the face of contemporary multi-level systems. Once the regulatory process is understood as existing of multiple sequential steps, each of which can be allocated at a different level of governance, which are not necessarily in a hierarchical position vis-à-vis one another, the decision to (de)centralize no longer captures the full range of regulatory choices available. Aside from reconsidering the (de)centralization terminology, Part II also discusses the impact of regulatory tools on regulatory functioning in light of competence allocation and the principles identified in Part I. It becomes clear that certain regulatory challenges, such as the accommodation of heterogeneity among jurisdictions,

⁷ Marks et al. (1996); Kohler-Koch (1996); Grande (1996). See generally Elazar (1987) and Watts (1998) (Discussing the different species of a federal order, such as federations, unions, confederations, leagues and decentralized unions).

⁸ See Phillippe Schmitter: ‘As an arrangement for making binding decisions that engages a multiplicity of politically independent but otherwise interdependent actors – private and public – at different levels for territorial aggregation in more or less continuous negotiation/deliberation/implementation, and that does not assign exclusive policy competence or assert a stable hierarchy of political authority to any of these levels.’ Fn 39 in Chowdcury.

⁹ Oates.

¹⁰ Revesz.

may be aggravated, or reduced, through instrument choice. The combination of these interrelated elements provides us with a set of competence allocation criteria that can give rise to a unitary or fragmented allocation of norm setting, implementation and enforcement over several levels of governance. In case of the latter, all competences will be allocated to the same level of governance, whereas the former sees the regulatory process shared between different levels of governance.

Part III completes this framework of competence allocation by setting out a schematic overview of the consequences of shared regulatory control. In case of fragmentation, competences within the regulatory chain are allocated to different levels of governance, which necessitates interactions between the relevant regulatory agencies. These interactions can have a positive effect when the actions of one regulatory agency strengthen that of another: for instance where the implementation activities strengthen the norms as decided upon during the norm setting stage. But the relationship between regulatory agencies can also be a detrimental one, where e.g. (lack of) enforcement action undermines implementation and norm setting. The importance of agency coordination is increasingly recognized within legal scholarship,¹¹ but has not yet been expressly linked to the issue of competence allocation, which itself is yet to be discussed in a systematic way.

In Part IV, the preliminary implications of competence allocation for policy design are discussed with respect to a case study of the European Union Emissions Trading Scheme (EU ETS). The EU ETS plays a crucial role in the European mitigation strategy for climate change and has thus far gone through two different competence allocation regimes, which has had marked effects on the functioning of the trading scheme. Part V concludes.

¹¹ Freedman (2012)/

I. FEDERALISM: A TALE OF ALTERNATE JURISDICTIONS

This Part sets out the existing theories of federalism, both legal and economic. For the purposes of this paper, the focus will lie on the way in which these theories (do not) deal with the existence of regulatory competences and their distinct roles within the regulatory process.

A. *Economic Theory of Federalism*

The term economic theory of federalism refers to an incredibly rich body of literature that encompasses various fields of economic research, including in particular public economics, fiscal federalism, public finance, and increasingly also the economics of information, organization theory, public choice and principal-agent theory.¹² The main analytical endeavor of this field has been to ‘enrich our understanding at a conceptual level of the structure and working of multi-level government’.¹³ I will discuss the main findings and contributions of these works by looking first at the initial studies that form the basis for the economic theory of federalism, also referred to as ‘fiscal federalism’, as developed some 40 years ago. After this overview, I will consider the more recent additions and developments in the field, which has been referred to as ‘second-generation theory of fiscal federalism’.¹⁴

1. First Generation: ‘Fiscal’ Federalism

In the 1950s and 1960s, Paul Samuelson, Kenneth Arrow and Richard Musgrave made important contributions to the field of public finance, which would later be the foundation for the normative economic work on (fiscal) federalism. The combination of Samuelson’s work on public goods,¹⁵ Arrow’s treatise on the conceptualization of the roles of the private and public sector,¹⁶ and Musgrave’s on public finance,¹⁷ set out a model of regulation where the public sector should step in, in case private provision of public goods had resulted in market-failure. Based on the implicit assumption that the relevant level of government would provide such goods while seeking to maximize social welfare, it followed that for public goods whose pattern of consumption is less than national, local (decentralized) provision of these goods could result in improved social welfare, as compared to a national uniform level of public good provision. In 1972, Wallace Oates formalized this proposition in his ‘Decentralization Theorem’ (DT).¹⁸ In its most basic form, the DT finds that, in the absence of spillovers, local provision of public goods will be Pareto superior to centralized provision of public goods,¹⁹ given that centralized provision is presumed to be

¹² Oates (2005); Qian and Weingast (1997).

¹³ Oates (2005), at 349.

¹⁴ Oates (2005), at 349.

¹⁵ Samuelson (1954), at 387; Samuelson (1955), at 350-356.

¹⁶ Arrow (1970).

¹⁷ Musgrave (1959); Musgrave (1939), at 213.

¹⁸ Oates (1972).

¹⁹ ‘Pareto optimality or efficiency’ refers to a state of the world where no more changes to the allocation of goods among a set of individuals could be made without at least one person being better off and no other individual worse off. If a situation is Pareto superior to another, it means that there are still Pareto improvements to be made,

synonymous to a uniform level of output across jurisdictions.²⁰ The assumption that centralization equates uniformity is justified by reference to the fact that proximity of local governments to their constituents makes it so that they have superior knowledge of their preferences and conditions,²¹ and that it might be politically costly to differentiate between jurisdictions at the central level.²²

Tiebout's well-known 'voting-with-the-feet' model also argues in favor of local provision of public goods.²³ Samuelson's earlier work claims that decentralization would not result in an efficient provision of public goods, due in part to the lack of incentives for parties to make their preferences for goods explicit;²⁴ in Tiebout's model, the decentralized provision of *local* public goods is Pareto-efficient under certain, rather restrictive, conditions.²⁵ This efficiency would be achieved through the relocation of citizen-consumers between localities which each offer a different mix of public goods, assuming there are no externalities and the number of localities is at least equal to the type of citizen-consumers.²⁶ An important difference between Tiebout's theory and Oates' DT is that Oates assumes there would exist a 'systematic difference in tastes across jurisdictions',²⁷ even without mobile individuals, whereas Tiebout partly ascribed differences in local preferences to the local differentiation of public goods supply.²⁸ Although the later may appear to be counter intuitive, following Tiebout's assumption of perfect mobility between jurisdictions, local governments may be considered as firms each offering a different mix of public goods products in order to cater to the entire range of 'consumers' (citizens).

These theories accumulate in an important normative finding of the economic theory of federalism: the geographical area in which the benefits of public good materialize should be matched with the geographical scope of the governmental jurisdiction, which typically results in

i.e. individuals could still be made better off without making another individual worse off. Pareto efficiency does not incorporate a sense of equity, or other socially desirable aspects of distribution.

²⁰ See also Oates (1972) and Oates (2005) ('[U]nder certain conditions, a varied pattern of local outputs in accordance with local tastes will be Pareto superior to an outcome characterized by a centrally determined, uniform level of output across all jurisdictions.')

²¹ See also Inman and Rubinfeld (2000) (argue that participation of interest groups and individuals may rise with increased decentralization and this increased political participation may place more pressure on the local regulator to conform to local preferences). Conversely, one may also argue that the likelihood of regulatory capture increases when the links between the regulator and regulated are closer. Stigler, (1971), at 3 ("as a rule, regulation is acquired by the industry and is designed and operated primarily for its benefit"); Dal Bo (2006), at 203 (regulatory capture broadly refers to "the process through which special interests affect state intervention in any of its forms". More narrowly defined, regulatory capture refers to the process "through which regulated monopolies end up manipulating the state agencies that are supposed to control them".)

²² Oates (2005), at 353.

²³ Tiebout (1956).

²⁴ Tiebout (1956), at 416-24, *cf* Samuelson (1954).

²⁵ Tiebout (1956), at 419 (These assumptions are: 1) consumer-voters are fully mobile, 2) consumer-voters have full knowledge of differences between communities, 3) there is a large number of communities to choose from, 4) no employment-related restrictions, 5) public services exhibit no external economies or diseconomies between communities, 6) for every preference pattern there is an optimal community size which is determined by the number of residents for which this bundle of preferences can be produced at the lowest average cost, 7) communities under the optimum size will seek to attract new residents to lower average costs).

²⁶ See also Mueller (2003), 192 onwards (discusses the effects of the height of the rental income of the individual joining an optimal size community. It is submitted that if an individual has a high enough rental income, the welfare of the existing member will always be increased, even if this individual brings the community over its optimal size. The full effects of rents in relation to voting-with-the-feet are beyond the scope of this paper but are well set out in Mueller, *infra*.)

²⁷ Oates (2005), at 354.

²⁸ Seabright (1998), at 214.

decentralization.²⁹ There are however cases where the provision of ‘local’ public goods produced interjurisdictional spillovers: benefits (or costs) that materialize in other jurisdictions.³⁰ In the presence of such spillovers, Oates’ Decentralization Theorem considers the decision between centralization and decentralization to be a trade-off, which depends on the extent of heterogeneity of preferences and the degree of spillovers.³¹ Nevertheless spillovers are not considered a default reason for centralization; introducing subsidies from the central government to the decentralized governments could cause them to internalize the benefits without a need for centralization.³²

In brief, the findings and recommendations of the first generation of fiscal federalism for the assignment of public responsibility to different levels of government can be summarized as follows: *“Services should be provided by the smallest jurisdiction that encompasses the geographical expanse of the benefits and costs associated with the service. In this way, all the benefits and costs are internalized, and, at the same time, we can take full advantage of tailoring service levels to the particular tastes and other circumstances that characterize the individual jurisdictions. Rather than providing a uniform level of public outputs over a large area, we can increase social welfare by differentiating these outputs in accord with local preferences and conditions.”*³³

2. The Second Generation Theory

From the 1980s onwards, the findings of fiscal federalism have been enriched and challenged by economic scholarship from other related fields, such as political economy.³⁴ The ‘second-generation theory of fiscal federalism’ covers many different aspects of fiscal federalism theory, parts of which, such as discussion regarding the structure of fiscal institutions, fall outside the scope of this overview.³⁵ Of these new perspectives, the public choice and political economy work regarding the objectives of political participants, the application of the principal-agent model, and the role of information are particularly relevant to our framework, since they go the heart of some of the assumptions underlying the first generation of the economic theory of federalism.

One of the central precepts of the economic theory of federalism, as developed in the 1950s and 1960s, was the assumption that government agencies would seek to maximize social welfare. This assumption was challenged with the emergence of public choice, starting with Niskanen in the 1970s. Niskanen formalized the theory of budget maximization, which characterized public agents as seeking to maximize their budgets, rather than social welfare.³⁶ Budgets are considered a proxy for other objectives that (employees of) governmental agencies may

²⁹ See also Olson (1969) (referring to this phenomenon as ‘fiscal equivalence’).

³⁰ Tiebout’s model (1956) relies on the explicit assumption that there are no externalities.

³¹ See also Besley and Coate (2003), at 2612.

³² Pigou (1927); Oates (2005) (on the Pigouvian theory of subsidies), cf Carlton and Loury (1980) (showing that a Pigouvian tax will only efficient allocation of resources in the long run, if it is supplemented with a lump sum tax-subsidy scheme for participating firms, then a socially efficient allocation can be achieved).

³³ Oates (1997), at 1323.

³⁴ Political economy theories will be discussed in more detail in a separate paper. The overview in this paper focuses on those part of political economy that have particular implications for the economic theory of federalism.

³⁵ For an extensive overview see Oates (2005).

³⁶ Niskanen (1968), at 293; Niskanen, (1971).

aspire to, such as power and influence, larger salaries and larger staffs. Brennan and Buchanan offered another perspective in the 1980s, describing the public sector as a 'Leviathan' that seeks to better its own position and has characteristics of a monopoly.³⁷ Moving away from the assumption that governmental agencies seek to maximize social welfare and focusing instead on the individual objectives that participants of the political process may have, changed the role of decentralization; for Brennan and Buchanan decentralization becomes a way to limit the monopoly of the government by introducing competition between decentralized governments.³⁸

Beyond these public choice insights into the incentives of elected officials and bureaucrats, the political economy approach to fiscal federalism provides additional insights into the behavior of voters. The first-generation literature provides a normative trade-off between inefficiencies due to lack of preference consideration (centralization), and inefficiencies due to spillovers (decentralization). Political economy suggests a trade-off between local 'accountability' (sensitivity to local preferences) versus 'a coordination of policies under centralization that serves to internalize interjurisdictional interdependencies' (capture of externalities).³⁹ This approach moves away from the assumption of uniformity as a result of centralization and adds further elements to the trade-off between centralization and decentralization. This does not necessarily change the outcome of the analysis but it does offer some additional and different solutions.⁴⁰ One of such solutions comes from the application of the principal-agent model to the public sector.⁴¹

The principal-agent model can be shaped in two different ways: by considering the central government as the principal and the local government as agents,⁴² or by viewing the different levels of government as agents of the electorate.⁴³ In both cases, questions as to what extent these 'contracts' between the principal (the central government or the electorate) and the agent (the local or central/local government respectively) are complete and/or enforceable prove problematic. With respect to cooperation between different (sovereign) jurisdictions in order to overcome problems of interjurisdictional spillovers – as opposed to resolving this problem through centralization – political economy scholars identify a set of problems, which complement the efficiency consideration of fiscal federalism. These problems can prevent effective cooperation between different decentralized jurisdictions,⁴⁴ leading to a situation of 'forced' centralization. Examples of such situations are those where a coordinated agreement cannot be reached due to a 'tragedy of the

³⁷ Brennan and Buchanan (1980).

³⁸ See also Oates (2005) at 355. The success of decentralization in constraining the central government has been contested by empirical work on this, see Oates (1985), (1989).

³⁹ Oates (2005), at 357.

⁴⁰ Besley and Coate (2003), at 2628 ('[T]he key insight remains that heterogeneity of preferences and spillovers are correctly at the heart of the debate about the gains from centralization.')

⁴¹ Ross (1973)

⁴² See also Inman (2003) who labels this 'administrative federalism'.

⁴³ See e.g. Tomassi (2003) (who uses a common agency model to capture the problem of the control of public officials by citizens through the design of an optimal contract, he finds that decentralization may be preferable even in case of perfect homogeneity of preferences across local jurisdictions) and Seabright (1996) (viewing elections as incomplete contracts, where centralization allows for better capture of externalities and decentralization allows for greater accountability).

⁴⁴ Seabright (1998), at 215.

commons',⁴⁵ collective action problems,⁴⁶ presence of a prisoner's dilemma,⁴⁷ or more general free-rider type situations.⁴⁸

Another addition to the federalism literature is provided by work on the role of information based on microeconomic theory and industrial organization scholarship. There are various ways in which information impacts on (de)centralization choices, going back to the problem of information asymmetries, which formed the basis for the assumption that local governments would be better informed regarding the preferences of their constituents, and the related cost functions, based on their proximity to the issues as compared to central government. A related issue is the potential for economics of scale and/or scope in centralized decision-making.⁴⁹ In situations where the regulation of public good provision requires technologies that involve large-scale investments,⁵⁰ or a high level of expertise,⁵¹ the centralization of scientific research, data collection and technical analysis may significantly reduce information costs.⁵² Moreover, economies of scope may occur when certain policy responsibilities require a fixed resource that can also be used for another policy responsibility at no additional costs.⁵³ For example, the expertise needed for banking and insurance sector regulation is comparable and may share many common costs.⁵⁴ One may also consider 'content-based' economies of scope, which occur when policies are combined to reinforce each other, or less ambitiously, care is taken to prevent policies from cancelling each other out.

The costs of information and regulation more generally forms part of the work by Victor Ostrom, who consider the nature of the public good provided, i.e. the type of services rendered, to

⁴⁵ Hardin (1968), at 1244 ('Picture a pasture open to all ... A rational herdsman concludes that the only sensible course for him to pursue is to add another animal to his herd. And another; and another... Each man is locked into a system that compels him to increase his herd without limit—in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in the commons brings ruin to all'); cf Dasgupta (1982) ("It would be difficult to locate another passage of comparable length and fame containing as many errors as the one above.") and Stavins (2011), at 88-9 ('Ruin is not the outcome of the commons, but rather excessive employment of capital and labor, small profits for participants, and an excessively depleted resource stock. Those are bad enough.');

⁴⁶ Olsen (1965); Poteete et al. (2010); Ostrom (2010); Camerer (2003) and Holt (2007) (experimental research on collective action problems).

⁴⁷ Dawes (1973)

⁴⁸ Homans and Wilen (1997) and Smith and Wilen (2003) (on the challenges of regulated open-access fishery); Ostrom (1990), at 8 (arguing that for problems which 'cannot be solved by cooperation [...] the rationale for government with major coercive powers is overwhelming.')

⁴⁹ Alesina, Angeloni and Etro (2005a) (Their paper characterizes the benefit of centralization as the possibility of exploiting economies of scale in the central allocation of policy responsibilities. It characterizes the costs of harmonization, principally, as those related to dealing with heterogeneity of preferences across the regions); Griffin (1981); Walsh (1996); Seabright (1998).

⁵⁰ Walsh (1996), at 71.

⁵¹ Hahn (1989), at 111 ('It might seem, for example, that if the problem is local, then the logical choice for addressing the problem is the local regulatory body. However, this is not always true. Perhaps the problem may require a level of technical expertise that does not reside at the local level, in which case some higher level of government involvement may be required.')

⁵² Adler (2005), at 145 (referring specifically to environmental regulation). See also Congressional Budget Office (1997).

⁵³ Carbonara, Luppi and Parisi (2008) at 3 (defining economies of scope as a situation where 'creating and enforcing two or more policies together costs less than doing so separately'.)

⁵⁴ Carbonara, Luppi and Parisi (2008), at 3.

change the relative advantages of (de)centralization.⁵⁵ Elinor Ostrom further qualifies this by stating that it is the regulatory cost involved, such as monitoring and enforcement costs, as well as costs connected to changing existing institutional arrangements, that are important in judging institutional arrangements.⁵⁶ Based on these considerations, regional and national governments are considered most useful as facilitators, providing the basic needs and boundary conditions for local governments.⁵⁷ A danger of this approach, as recognized by Ostrom, is that when these arrangements become standardized, the effectiveness and fairness as perceived by the local regulators is reduced which can result in high monitoring and enforcement costs of said rules.⁵⁸ This analysis hints at the fact that the regulatory process should be seen as involving different steps and that the (de)centralization debate should take account of more than the policy-making competences and take account of broader implementation and enforcement competences.

A final consideration in the field of economic theories of federalism relates to risk diversification. Arcuri and Dari-Mattiacci, building on the Condorcet Jury Theorem, recently explicitly applied the issue of risk diversification to the choice between centralization and decentralization.⁵⁹ Their model shows that centralization more often succeeds at delivering the 'right' decision in terms of policy as compared to decentralized systems due to the possibility of pooling expertise at the central level, *ceteris paribus*. However, the consequences of an erroneous decision at the centralized level can be global, rather than locally confined. They conclude that in case of independent risks, the choice between centralization and decentralization depends on the level of scientific expertise available: if advanced expertise is available, centralization guarantees more accurate decisions and less risk. Centralization continues to deliver more accurate results in case of less available expertise but decentralization lowers the risk that comes with an erroneous decision.⁶⁰ Risk diversification is also mentioned in the field of organization economics where the possibility to lower risk also plays a role in deciding between coordinated and independent action of division in multidivisional organizations.⁶¹

3. Implications for Competence Allocation

The rich economic theory of federalism literature draws from various streams of economic sub-disciplines. The selective summary given here aims to highlight that there are certain shared considerations on which these different approaches base their preference for (de)centralization, even if their application and outcome is different. Essentially, these considerations can be grouped as follows: the accommodation of heterogeneous preferences and conditions of different jurisdictions; the need to capture (possible) externalities; the aim to maximize economies of scale and/or scope; and allowing for risk diversification. The theoretically optimal allocation of powers

⁵⁵ Ostrom (1974), at 68-69.

⁵⁶ Ostrom (1990).

⁵⁷ Ostrom (1990), 214.

⁵⁸ Ostrom (1990), 214.

⁵⁹ Arcuri and Dari-Mattiacci (2010), Condorcet (1785).

⁶⁰ Arcuri and Dari-Mattiacci (2010), at 374.

⁶¹ Alonso et al. (2008).

cannot be given at the hand of these principles without specific regard to the circumstances under which (de)centralization occurs – particularly with respect to the type of regulatory problem at hand.⁶² Moreover, little distinction continues to be made between regulatory competences, (de)centralization is assumed to take place for the whole of the regulatory process or not at all. Within the second generation literature on the economic theory of federalism, a move towards greater precision of the federalism models has been achieved through the understanding of governmental agencies and voters alike as groups with their own interest and maximization functions, as compared to the earlier assumption of governments as social welfare maximizers.

B. The “Legalization” of the Economic Theory of Federalism

Policymakers and jurists have been careful to underline the restricted relevance of economic considerations for (de)centralization of legal and/or political decisions. With respect to the area of environmental protection, for example, the United States Congressional Budget Office has stated that “[E]conomic analysis cannot prescribe which level of government should be making the various decisions about environmental protection.”⁶³ However, the Office qualified this statement by acknowledging that “[E]conomics does, however, help to answer the question of which level of government is most likely to make efficient choices about environmental protection – that is, choices that balance all of the relevant benefits and costs.”⁶⁴ Despite the general skepticism of the use of economics regarding the assessment of federalist decisions, some of the considerations of the economic theory of federalism have now also become part of the legal literature on federalism. Competition, financial and environmental law, in particular, have found application for these lessons. Given the application of our theoretical framework to climate change regulation, we will focus on the literature that has developed in the area of environmental law, where some of the ideas first expressed in economic and fiscal federalism have been applied and developed with great success.

1. The ‘Race-to-the-bottom’ Hypothesis & Regulatory Experimentation

The most important link between economic and legal scholarship is the race-to-the-bottom hypothesis as developed in, primarily, American legal (environmental) literature.⁶⁵ The race-to-the-bottom hypothesis posits that jurisdictions will compete with each other for investments and/or certain groups of voters/consumers by providing a relatively higher or lower level of public good provision than competing or surrounding jurisdictions.⁶⁶ Applied to environmental regulation, this

⁶² Most empirical studies remain inconclusive as to the effects of (de)centralization. See e.g. Strumph and Oberholzer-Gee (2002) (reviewing the assignment of regulatory responsibility to the various levels of government in the case of liquor control in the United States, finding that there is indeed a tendency for U.S. States with more heterogeneous preferences to decentralize liquor control); Estache and Sinha (1995); Fiske (1996); Fleurke (1995); Ostrom and Bish (1977); Prud’homme (1995); Segal (1995); and Werlin (1992).

⁶³ Congressional Budget Office (1997), at xi.

⁶⁴ Congressional Budget Office (1997), at xi.

⁶⁵ Oates (1997).

⁶⁶ In a globalised economy, there need not be geographical proximity between jurisdictions for there to be competition between them.

hypothesis predicts a downwards spiral in the provision of environmental protection in case of the decentralization of environmental policymaking since localities will have incentives to lower their standards in order to attract more (industrial) investment, to the detriment of environmental quality.⁶⁷ However, empirical evidence shows no conclusive evidence that allowing for decentralized environmental policy leads to ‘pollution havens’,⁶⁸ or ‘hot spots’.⁶⁹ When they are found, they are more likely to be created by low tax rates on capital rather than by pollution control costs, since the latter comprises a relatively small part of the total production costs of manufacturing industries and therefore does not dictate location decisions.⁷⁰ Put differently, environmental regulation is only one area of regulation in which jurisdictions can compete with each other; therefore the only complete solution for possible race-to-the-bottom behavior would be total centralization.⁷¹

Although it is still often referred to, the race-to-the-bottom phenomenon appears to have been widely discredited. Richard Revesz, one of the main legal contributors to this field, has gone as far as to state that ‘there is no compelling race-to-the-bottom justification for across-the-board federal minimum standards, which are the cornerstone of federal environmental law in both the United States and the European Union.’⁷² One of the main contributors to the fiscal federalism theory, Wallace Oates, has responded to the legal race-to-the-bottom literature on several occasions, finding that interjurisdictional competition should be considered predominantly positive.⁷³ He further submits that the failure of states to implement stringent standards in certain areas where there is also federal regulation may be due to the fact that the federal standards are already excessively stringent.⁷⁴ The later perspective also shows that there has been a growing appreciation for the possibility of a fragmented regulatory process where federal norm setting may

⁶⁷ See for instance Oates (1988); Oates (2002), at 9 (on race-to-the-bottom), 16-7 (on empirical studies on race-to-the-bottom); see also Stewart (1993), and Esty (1996), as quoted in Porter (1999).

⁶⁸ The location of emission may still be relevant for other environmental considerations such as the creation of so-called hot-spots or smog development. See e.g. Revesz (2008), at 450 (discussing the possibility of hotspots in the context of interstate air pollution), and Keohane and Olmstead (2007), at 173-77.

⁶⁹ Sigman (2007) (finds that states do not use the control of their programs to undercut federal environmental standards under ‘authorization’ by the United States federal government), at 23 (‘The results support the model’s prediction that the stronger the environmental preferences are in the state, the sooner the state will authorize. This association arises for authorization under both the CWA and the RCA. Although our main finding contradicts the conventional wisdom that authorization worsens the environment, it is consistent with other empirical literature, which often fails to find evidence that decentralization in the U.S. harms the environment.’)

⁷⁰ On this topic see Esty and Geradin (eds.) (2001), 282-294. See also Revesz and Stavins (2007), at 565 (Submit that very low capital tax rates will often be combined with high environmental standards, which are defined by equating the willingness to pay for environmental quality with the corresponding change in wages). The debate concerning the race-to-the-bottom continues but the assumption that it is a prime justification for central regulation has been widely discredited. See e.g. Revesz (1997); Revesz and Engel (1997).

⁷¹ Revesz (1997), at 1338 (‘If environmental regulation is federalized, the competition would shift to another arena and the reduction in social welfare implicit in race-to-the-bottom arguments would not be eliminated. The only solution would be total centralization of regulatory and fiscal functions, a policy that would have little, if any, support.’)

⁷² Revesz (1997), at 1337.

⁷³ Oates (1997), at 1322 (arguing that interjurisdictional competition is generally efficiency enhancing and that ‘the fear of a race to the bottom is, in my view, largely misplaced.’). Furthermore argues that any distortions, if they do occur, are likely to result in minor deviations from efficient outcomes, see Oates (2001a), at 137.

⁷⁴ Oates (1997), at 1326-27.

be complemented with state implementation.⁷⁵

There has also been considerable attention for the potential *benefits* of interjurisdictional competition, such as a regulatory experimentation, competition (race-to-the-top), and the potential facilitation of the adoption of controversial policies through phased adoption. In case of regulatory experimentation, jurisdictions may learn from each other's experiences, which may eventually improve the practice of regulation as a whole.⁷⁶ For instance, in the context of the United States, the decision of some states to establish emission trading schemes with differing designs, allowed for learning between these jurisdictions, which is beneficial both for the states themselves, and for a possible federal system that may be developed as a result.⁷⁷ Conversely, regulatory competition may give rise to certain 'information externalities' where experimental policies of one jurisdiction may generate valuable information for others, which may result in free-riding behavior.⁷⁸ Aside from regulatory learning, decentralized policymaking could even result in federal or central regulation on an issue, which would have previously been considered (too) controversial.⁷⁹ There have also been signs of regulatory competition between jurisdictions, which result in a race-to-the-top rather than bottom. An example of this can be found in foreign investment practices where regulatory regimes with a higher degree of legal certainty and better legal and economic institutions are better able to attract foreign investors.⁸⁰

A final cost-based argument, which has found its way into the legal debate, is the role of heterogeneous conditions and the availability of information regarding these conditions to different regulators. In the United States, (information regarding) the variation in environmental circumstance in the different states is considered one of the main reasons for decentralization,⁸¹

⁷⁵ Stigler (1957), at 216: 'Competition among communities offers not obstacles but opportunities to various communities to choose the type and scale of government functions they wish.'

⁷⁶ Oates (2002) (argues in favour of 'laboratory federalism'); Scott (2011), at 33 ('Just as federalism is said to offer some advantages, including the possibility for regulatory experimentation and regulatory learning, so too can the multi-level governance associated with a regime complex create incentives and opportunities for regulatory innovation and regulatory learning across different states.') Oates (1999), at 22 (arguing that decentralization can be important in offering an opportunity for experimentation). See also Buzbee (2010), at 17 (Arguing that preemption by the federal government in the area of environmental protection and especially climate change would negate the many advantages of state involvement in environmental regulation and may eventually lead to regulatory failure.) ('Institutional diversity retaining federal, state and local roles would be more stable and conducive to market and regulatory innovation');

⁷⁷ At the time of writing, there appears to be a stalemate in U.S. domestic politics regarding the development of a federal cap-and-trade system (Stavins (2011), at 101), which means that sub-national policies, such as the Regional Greenhouse Gas Initiative remains most promising (put in place by the Northeast and California's Global Warming Solutions Act (2006)).

⁷⁸ Oates (1999), at 1133 ('There exists a basic "information externality" in that states that adopt new and experimental policies generate valuable information for others. And this creates a standard sort of incentive for free-riding. From this perspective, we might expect too little experimentation and policy innovation in a highly decentralized public sector. Indeed, as Strumpet shows, it is unclear whether a centralized or decentralized outcome will result in more policy innovation.')

⁷⁹ Engel (2006), at 177 ('[R]egulatory activity at one level – state or federal – may be a stepping zone to regulation at the governing level that dual federalism proponents label "optimal". Thus, to achieve regulation at the level of government considered optimal, policymaking may need to begin at a different level of government.')

⁸⁰ See OECD (2000 onwards).

⁸¹ See e.g. Butler & Macey (1996), at 27 (critiquing the centralization of environmental regulatory authority to the federal level in the United States and arguing for reform through market-based regulation, economic property rights or greater state control.) ('We conclude that, in every area of pollution, environmental regulation has been centralized beyond any possible justification, resulting in tremendous costs.')

especially due to the information costs this variation imposes at the central level: expertise regarding local circumstances is arguably more costly to acquire at the central level and this problem is not necessarily overcome through centralization.⁸²

2. The European Principle of Subsidiarity

Most of the legal literature referred to thus far is based on experiences with the U.S. legal system. However, much of the regulatory backdrop for this paper, and accompanying papers, is formed by the European Union's legal order (EU). The academic and policy discourses in United States are not necessarily applicable to, or predictive of those in the EU. Extensive reference is made to the race-to-the-bottom hypothesis in European discussions regarding (environmental) competence allocation as well,⁸³ however, we must consider these in light of the so-called 'principle of subsidiarity',⁸⁴ which provides the legal basis or condition on which competence allocation takes place within the EU.⁸⁵ The principle of subsidiarity is set out in Article 5(3) of the Treaty on European Union and reads as follows: *'Under the principle of subsidiarity, in areas which do not fall within its exclusive competence, the Union shall act only if and in so far as the objectives of the proposed action cannot be sufficiently achieved by the Member States, either at central level or at regional and local level, but can rather, by reason of the scale or effects of the proposed action, be better achieved at Union level.'*⁸⁶ Despite its prima facie legal nature, it may be argued that the application and interpretation of the principle of subsidiarity depends in part on arguments founded in economic theory.

There has been a reduced willingness of Member States to accept centralized policymaking

⁸² See e.g. Adler (2007), at 77 ('Environmental knowledge, like economic knowledge, is highly decentralized. Specific knowledge about local ecological conditions [...] is more likely to be found at the local level than in a centralized bureaucracy. Due to the decentralized nature of knowledge, one might expect that environmental protections would be adopted first in those areas where local knowledge about the need for such protection is the greatest.') See Adler (2007), at 137. ('[T]he ecological and economic diversity of the nation requires local knowledge and expertise that is often unavailable at the federal level. A more decentralized system is better able to overcome this "knowledge problem" and ensure that regulatory measures take account of local conditions.'). See also Butler and Macey (1996), at 27 ('Federal regulators never have been and never will be able to acquire and assimilate the enormous amount of information necessary to make optimal regulatory judgments that reflect the technical requirements of particular locations and pollution sources.'). See also Kimber (1995), at 1661.

⁸³ See e.g., Brus, Raimond and Drupsteen (1994), at 647; Lenaerts (1994), at 879-82; Schemmel and de Regt (1994), at 80; Stewart (1992), at 44-46; Bergh, Faure and Lefevere, (1996), at 121, 127-29, 131-32.

⁸⁴ Treaty on European Union (2008), Article 5 (1) ('The limits of Union competences are governed by the principle of conferral. The use of Union competences is governed by the principles of subsidiarity and proportionality.') In the United States, the constitutional constraints regarding the centralization of regulation have been weakened over time due to increased inter-state trade and the development of multi-state corporations. See Lamoreaux (1985), and the Great Depression (1929). At the moment, few areas are still dominated by state laws. See e.g. Strumph and Oberholzer-Gee (2002), at 1 ('In 1900, the U.S. federal government controlled about one-third of total government expenditure. Today, this share is larger than 50 percent.'). See also United States v. Lopez (1995) (Supreme Court held that the authority of Congress under the Commerce Clause had been exceeded) and Printz v United States (1997) (holding that Congress cannot compel state officers to execute federal laws).

⁸⁵ Treaty on the European Union (2008), Articles 3 and 4. The consolidated versions of the Treaty on European Union (TEU) and the Treaty on the functioning of the European Union (TFEU) (formerly known as the Treaty on the European Community), came into force on December 1 2010, may also be referred to as the 'Lisbon Treaty'. The treaty of Lisbon (Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community, signed at Lisbon 13 December 2007, 2007/C 306/01) amended the two existing European treaties, and established several Protocols and Declarations.

⁸⁶ Treaty on the European Union (2008), Article 5(3).

at the European level, which is partly reflected by the inclusion of Protocol No. 2 to the Lisbon Treaty which provides guidance for the interpretation of the subsidiarity principle by the European Union institutions.⁸⁷ The guidelines contained in the Protocol are mainly procedural, setting out certain legislative steps for the European institutions to follow. Reference is made to an assessment of the proposal's 'financial impact' and that account should be taken that 'any burden, whether financially or administrative, falling upon the Union, national governments, regional or local authorities, economic operators and citizens 'should be minimized'.⁸⁸ Moreover, the doctrine of conferred powers aims to ensure that any competences that have not been conferred to the EU remain with the Member States.⁸⁹ Protocol No 25 on the Exercise of Shared Competences, Declaration No 18 in Relation to the Delimitation of Competences, and the subsidiarity principle combined with Protocol No 1 on the Role of National Parliaments in the European Union also help to convey the image of a stronger check on the use of competences by the EU.⁹⁰

As pointed out by Hendriks, very little has been said regarding the actual content of the subsidiarity test: what form should the qualitative and quantitative indicators take in order to successfully apply the principle of subsidiarity?⁹¹ Legal academia and the European Courts thus far provide little guidance regarding the *content* of the principle of subsidiarity, as opposed to its more general political (and strategic) role in the European debate.⁹² Grainne de Burca has developed several questions, which arguably cover the most important trade-offs under a possible subsidiarity test. Of these five questions, at least two refer explicitly to economic-based arguments: the presence of interjurisdictional externalities, for instance through negative effects on the internal market,⁹³ and possible economics of scale.⁹⁴

3. Implications for Competence Allocation

The normative framework developed in this paper is based on arguments first advanced by the economic theory of federalism, which have also found their way into the legal debate. Issues such as externalities, scale economies and information costs are increasingly recognized by legal scholars as impacting on decisions of (de)centralization of regulatory powers, even when this is

⁸⁷ Protocol No 2 (2010).

⁸⁸ Protocol No 2 (2010), Article 5.

⁸⁹ Treaty on the European Union (2008), Article 1, read together with Articles 4(1) and 5(1)(2) TEU.

⁹⁰ Vedder (2010), at 292-3.

⁹¹ Hendriks, (2010).

⁹² See for instance Maher (1995) (arguing that the subsidiarity principle has mainly symbolic and political significance, moving away from centralizing tendencies); Berman (1994) (stressing the importance of the subsidiarity principle as a normative procedural requirement); De Burca (1999) (finding that the limited impact of the principle of subsidiarity is due to the wide margin of discretion enjoyed by the European institutions in their interpretation of the Treaties and that the Protocol adds to the open-endedness and vagueness of the subsidiarity principle). Regarding the European Court of Justice's interpretation of the subsidiarity principle, see for instance Case 9/74 (1974), and Case 65/81 (1982); Case C-415/93 (1995), para 72-78. Arcuri and Dari-Mattiacci (2010) (finding that the ECJ tends to allow more decentralization in the presence of high scientific uncertainty).

⁹³ Harmonization of European Union law is often justified with reference to the protection of the internal market. See Close (1978), 470-472; Haagsma, (1989), at 355; Lomas (1988), at 511.

⁹⁴ See e.g. de Burca (1999), at 32 ('How strong and how compelling are the internal-market requirements/competitive distortions/trade restrictions/cross-border effects in question? [...] What are the countervailing arguments in favour of Member State action, e.g. such as the decision of the states to specify expressly in the Treaty that they retain national competence over a closely related or overlapping policy area?')

considered undesirable. The interpretation of legal principles that speak to the division of powers within a federal-type system, such as the European principle of subsidiarity, no longer depends solely on legal or political argumentation.⁹⁵ Moreover, the role of individual regulatory competences is increasingly explicitly discussed due to the greater attention paid to the legal particularities of different federal systems within legal literature.⁹⁶ This goes some way to addressing what may be considered the ‘missing link’ in much of the (earlier) economic literature on federalism, namely the lack of differentiation between the different tasks of government – norm setting, implementation and enforcement. Part III will construct an extended theoretical framework that incorporates a distinction between regulatory competences.

⁹⁵ Alesina, Angeloni and Schuknecht (2005) (providing empirical evidence on the expansion of the policy-making role of the European Union in the years between 1971 and 2000. They find that in the European Union something seems to have drawn the process of allocation of policy responsibilities away from the optimal balance of economies of scale and the heterogeneity of preferences. Substantial harmonization and centralization have occurred in areas where heterogeneity of preferences is predominant (like social protection or agricultural policy) whereas other areas characterized by strong economies of scale have remained in the local domain (like defence and environmental protection).)

⁹⁶ See e.g. European Commission (2009d).

II. REGULATORY COMPETENCE ALLOCATION: MISSING LINK(S)

*'It is important to emphasize that the issue is not whether environmental policy should be centralized or decentralized. [...] The issue for environmental federalism is the proper assignment of the various roles to the different levels of government.'*⁹⁷

Prima facie, both the economic and legal analysis, tend to focus on the centralization or decentralization of regulatory powers without (sufficiently) distinguishing between the different parts of the regulatory chain – i.e. norm setting, implementation and enforcement. Rephrasing the federalism question as one that considers competing competences, we can relate the issues discussed in the economic theory of federalism more precisely to the (de)centralization of specific parts of the regulatory process (regulatory competences). Put differently, the decision to (de)centralize must be taken with respect to each regulatory competence – norm setting, implementation or enforcement – individually since each of these competences will have different effects on the ability of a regulatory process to capture externalities, deal with heterogeneous conditions and preferences and achieve economies of scale. It cannot be (implicitly) assumed that the centralization of norm setting is sufficient to overcome, for instance, a collective action problem caused by the presence of externalities. The allocation of implementation and enforcement competences must also be discussed since a failure to implement or enforce may negate the centralized norm setting effort with respect to the relevant externalities.⁹⁸

This section will discuss several missing links within existing theories of federalism: the role of competences, the expansion of the previously binary choice of (de)centralization, the normative trade-off that has to be made in the allocation of competences, and the implications of instrument choice for this trade-off. Many of these issues are context specific: for instance, the trade-offs can differ depending on the policy problem that the regulation is trying to address. Given our later application to the European Union Emissions Trading Scheme, the regulation of a global transboundary environmental problem (i.e. climate change) will be taken as the regulatory backdrop to this discussion.

A. Competences

The parameters of our 'regulatory competence' variable are formed by three sets of competences that together make up the regulatory process:⁹⁹ norm setting (also referred to as policy

⁹⁷ Oates (1997), at 1329.

⁹⁸ This 'second-level' collective action problem can undermine the effectiveness of transboundary environmental policy and has been acknowledged in the academic debate but arguably insufficiently explored. See e.g. Aaken (2009), at 33-57. ('Whereas the two-level game of lawmaking procedures is well acknowledged in the scholarship, the two-level game in the second stage, the compliance decision, has not been extensively analysed.');

Pallemaerts (2009). See also Ben-Shahar and Bradford (2010). See generally Olson Jr. (1965).

⁹⁹ The term 'regulation' has become a term of convenience referring to practically any activity, mostly of public actors but increasingly also private parties, which aims to influence behaviour in order for it to conform to a given standard. Within legal scholarship, a more precise definition, which is commonly referred to, is limited to the regulatory methods of enforcement of conduct requirements or prohibitions by administrative, criminal or civil actions backed by the coercive power of the state, rather than including also norm-based practices and institutions.

making), implementation, and enforcement. This division loosely follows the distinction between *primary* and *secondary* regulatory norm setting as referred to by Richard Stewart.¹⁰⁰ *Primary* regulatory norms are those, which define the recommended or prescribed behavior for the regulated parties. Within the context of this research, those responsible for setting these behavioral norms will be referred to as 'norm setters' and/or 'policy makers'. *Norm setting* forms the foundation of the regulatory process, where decisions are taken regarding the policy goal that will be pursued. This stage may also involve the choice of regulatory instrument, and the allocation of implementation and enforcement competences to other regulatory institutions. In practice, the allocation of competences is often pre-determined by the constitutional setting of the regulatory activity. We will assume that both instrument choice and competence allocation are exogenous; norm setting thus only involves the setting of behavioral standards.

Implementation refers to the setting of *secondary* regulatory norms, which serve to set out more precise arrangements for implementation and enforcement.¹⁰¹ Implementation typically involves a further specification of the exact rules, offences and sanctions, for instance through more detailed legislation (standard-setting). Depending on the pre-existing institutional setting, this process may also include the creation of specific agencies, which are responsible for the administration of different parts of the regulatory process (administration). The dividing line between norm setting and implementation is somewhat fluid since, depending on the regulated behavior, the norm setting may define desirable behavior in different levels of specificity. For example, if a policy maker decides that the use of renewable energy by consumers must increase by 30% over the next five years, the implementer then decides how to translate this norm into concrete standards for energy providers in terms of energy mix, or a subsidy scheme for private parties, as well as deciding on potential sanctions. If however, the norm itself is already more specific, for instance lowering the maximum speed on highways from 120 km/h to 110 km/h, implementation may be limited to defining sanctions for non-compliance.

Enforcement competences encompass actions to monitor behavior in order to ensure compliance with set standards, and the sanctioning of potential violations. Enforcement may take place through both formal and informal methods, the former referring primarily to legal processes involving administrative mechanisms, civil action or criminal persecution, whereas the latter includes 'softer' mechanisms such as advice, negotiation, education and persuasion.¹⁰² Despite the arguably important role played by these informal mechanisms, the focus within this paper will be on the formal methods of enforcement provided by the relevant legal framework within which regulation is developed.¹⁰³ Traditionally, enforcement powers are strongly associated with the

See Stewart (2010), at 2 ('In defining regulation as involving enforcement of conduct requirements or prohibitions, this essay follows what Neil Walker has identified as the narrow view of regulation - one shared by most lawyers - as distinguished from a broader view of regulation that encompasses other norm-based practices and institutions that shape conduct in regular patterns, including much network regulation and elements of new governance.')

¹⁰⁰ Stewart (2010), at 3.

¹⁰¹ Stewart (2010), at 3.

¹⁰² See also Rooij (2006) ('Enforcement is here defined as the state's actions to detect violations to stop them, and to prevent further violation from occurring in the future.')

¹⁰³ See Abbot (2009), at 8-9. See also Hutter (1997), as quoted in Abbot, *infra*, 8-9 ('[T]hese [informal enforcement techniques] were used by all law enforcement officials, but came into particular prominence in the

police powers of the state – one of the often-cited weaknesses of international law is the lack of comparable powers of the international institutions that create these laws, and thus a lack of enforcement potential, which may account for the fact that enforcement rarely takes place at the international level.¹⁰⁴ These discussions presume that enforcement rests with public institutions that act as agents of the government. Increasingly, however, regulation provides for private actors to supplement or replace these public actors. Within this paper, enforcement will therefore refer to both public and private actions that induce compliance on the basis of a governmental mandate. Compliance can also be increased through actions by private actors on their own behalf, for instance through tort proceedings.¹⁰⁵ These forms of private enforcement fulfill an important ancillary role to ‘public’ enforcement, both through public and private institutions, and will be discussed where relevant.¹⁰⁶

B. (De)Centralization

The terms centralization and decentralization are ubiquitous in the existing literature, and have taken on a certain ‘you know it, when you see it’ quality, with many scholars presuming that the terms require little to no formal definition.¹⁰⁷ Definitions of (de)centralization are most commonly provided in cases where one specific element or type of (de)centralization is envisaged.¹⁰⁸ Another common feature of these discussions is that (de)centralization is considered a binary choice. It must be noted however that centralization and decentralization can also be considered as two points on a continuum.

Drawing on public administration literature, we find a more general definition of (de)centralization, which makes an initial distinction between territorial and functional decentralization.¹⁰⁹ Territorial decentralization concerns the distribution of powers between different tiers of government.¹¹⁰ Functional decentralization on the other hand, refers to the dispersal of control over particular activities, and is often ‘vertical’ rather than ‘horizontal’. For example, a shift from public to private ownership could be a form of functional decentralization but does not necessarily imply anything about tiers of government.¹¹¹ Given our focus on competence

regulatory arena.’). Ideally, enforcement serves to sanction both existing behaviour and to deter actors from future violations.

¹⁰⁴ See e.g. Stewart (2010), at 10 (‘In the global setting, on the other hand, the problem is the relative weakness of institutions. Market-based and information-based programs can potentially address both types of problems.’)

¹⁰⁵ See e.g. Shavell (1984).

¹⁰⁶ See also Cooter (2000) (discussing the effects of social norms on law, specifically the fact that norms, rather than written laws, may induce changes in behaviour and similarly that social norms may have several effects on law: expression, internalization, and deterrence), and Zeben (2010) (on the role of ‘horizontal’ private enforcement in European environmental law).

¹⁰⁷ Bird (1993), at 208 (“Decentralization seems often to mean whatever the person using the term wants it to mean”).

¹⁰⁸ For instance, Arcuri and Dari-Mattiacci and take centralization to mean a concentration of experts in one single committee as compared to a distribution of the same number of experts among several jurisdictions in case of decentralization. Dari-Mattiacci and Arcuri (2010), at 2.

¹⁰⁹ Rondinelli (1981); Maddick, (1963).

¹¹⁰ Rondinelli (1981).

¹¹¹ Bray (1994), at 819.

allocation between different governmental levels, our theoretical framework clearly draws on territorial, rather than functional decentralization. There is a rich (social science) literature that further categorizes types of territorial decentralization in different ways.¹¹² The most influential has been the typology of Rondinelli,¹¹³ which distinguishes between deconcentration, fiscal decentralization, and devolution.¹¹⁴ These types of decentralization are not mutually exclusive and may take place at the same time.¹¹⁵

Deconcentration, also referred to as administrative decentralization, occurs when agents in higher levels of government move to lower levels. Fiscal decentralization describes the process when higher levels of government cede influence over budgets and financial decisions to lower levels. Devolution, or democratic decentralization, occurs when resources, power, and often tasks are shifted to lower-level authorities who are somewhat independent of higher authorities, and who are at least somewhat democratic. Decentralization is an umbrella term, which may refer to any of these processes. On the basis of this typology, the centralization or decentralization of competences takes the shape of devolution: the regulator responsible for the execution of a given competence will be presumed to have complete discretion with respect to these competences, as opposed to a situation of delegation.¹¹⁶

Having mapped the process of (de)centralization, we can reflect on the categorization of a certain regulatory level as 'central' or 'decentralized/local'. Discussions regarding federalist systems typically presume a two-layered system.¹¹⁷ The model developed in this chapter will be

¹¹² Cohen and Peterson (1999) (identify six major approaches to classify decentralization. The Historical approach (Types: French, English, Soviet and Traditional decentralization); the Hierarchy and Function approach of the Berkeley Decentralization project (Types: Territorial and Functional decentralization); the Problem and Value centered approach (Types: Devolution, Functional devolution, Interest organization, prefectural deconcentration, ministerial deconcentration, delegation to autonomous agencies, philanthropy and Marketization); the Service delivery approach presented by the United nations in 1962 (Types: Local level government systems, Partnership systems, Dual systems and Integrated administrative systems); the Objective Based Approach (Types: Administrative (deconcentration, devolution & delegation) Political, Spatial, Market decentralization); and Finally the Single country experience approach); Tiersman (2000) (defines five types of political decentralization (structural decentralization, decision decentralization, resource decentralization, electoral decentralization and institutional decentralization) and outlines five arguments about how specific types may affect governance, using collected data on up to 154 countries).

¹¹³ Rodinelli (1981); Rondinelli and Nellis. (1986). (Expand the original typology to identify four popular typologies of decentralization: devolution, delegation, deconcentration, and divestment (or privatization). Devolution, refers to a situation in which the central government transfers authority for decision-making, finance, and management to quasi-autonomous units of local government. Deconcentration occurs when the central government disperses responsibilities for certain services to its regional branch offices. This does not involve any transfer of authority to lower levels of government and is unlikely to lead to the potential benefits or pitfalls of decentralization. Delegation refers to the situation in which the central government transfers responsibility for decision making and administration of public functions to local governments or semiautonomous organizations (local governments are not wholly controlled by the central governments but are ultimately accountable to it). Finally, divestment is the transfer of public services and institutions to private companies and firms.) A simplified version of Rodinelli's typology has been adopted by the World Bank in the context of decentralization in developing countries, one of the main fields where decentralization theories have been developed. See Parker (1995).

¹¹⁴ See also Crook and Manor (2000).

¹¹⁵ Crook and Manor (2000).

¹¹⁶ The conceptual difference between harmonization and centralization must also be stressed: in the context of this book, the term 'centralization' is used to describe the conferral of discretionary decision-making powers to the central legislator whereas 'harmonization' refers to the conscious effort of the legislator to bring national (or local) laws in line with one another.

¹¹⁷ See e.g. Rose-Ackerman (1981), at 153.

applied to a multi-level system of governance in which one can distill at least three (public) levels of governance – international, European and national.¹¹⁸ We must therefore move beyond the choice of regulatory level as a binary one between the ‘central’ or ‘local’, based on the simplifying assumption that there are only two levels of governance. Furthermore, our definition of what is ‘central’ and ‘local’ must be relative to the policy area and institutional setting in question. The situation of the European Member States may be used as illustration: Until the 1970s, Member States’ national parliaments were the ‘central’ regulatory level in respect of environmental policy, with municipalities and localities serving as their ‘local’ or decentralized counterparts. However, as the European institutions increased their environmental policymaking, these national parliaments became decentralized implementers and enforcers to the central European policymaker. Put differently, the ‘central’ and ‘decentralized’ level can be defined only within a given regulatory framework and/or with respect to a certain area of regulation.¹¹⁹

With respect to the competences that we have identified – norm setting, implementation and enforcement – the terms ‘centralized’ and ‘decentralized’ then refer to the following: (i) for *norm setting*, the central and ‘local’ level are defined relative to the geographical scope of the regulated activity. Thus, if the regulated activity and its effects are restricted to one municipality, and norm setting takes place at the municipal, provincial, national or international level, norm setting may be considered centralized. If on the other hand, the (effects of the) regulated activity encompass several localities, but norms are set by individual municipalities, norm setting is decentralized; (ii) for implementation and enforcement, the decisive factor is the regulator’s relative position to the norm setting or the implementer, respectively. Put differently, if norm setting takes place at the national level, and implementation at the municipal level, implementation will be referred to as decentralized, regardless of whether norm setting itself is centralized or decentralized. Given that we allow for more than two regulatory levels in our theoretical framework, this can also mean that implementation and enforcement are both decentralized, but at different levels. For instance, in the case of a European policy – depending on the regulatory problem this could be the central level – that has been implemented by the national regulator (decentralized), and enforced by a municipality (also decentralized).¹²⁰

It is important to note that the choice to (de)centralize must be made for each individual competence. This can result in a *unified* model of regulation, where all competences are located at the same regulatory level, or a *fragmented* model where some competences are centralized and

¹¹⁸ Ylvisaker (1959).

¹¹⁹ Kumar Sharma (2006) (regarding the undesirability of the development of a more general definitions given the importance of mapping institutional specificities when giving policy advice).

¹²⁰ In this paper we take an issue specific approach to competence allocation. If one were to consider the division of competence between regulatory levels in a multi-level system in a more general way, considerations of the hierarchy between regulatory levels in terms of the possibility for interaction between levels also become relevant. I.e. whether the division of functions is fluid or pre-determined. See e.g. Rose-Ackerman (1981) at 153-4 (referring to the possibility of preemption in hierarchical federal systems.) This model should be contrasted with others, which have strict division of functions between high- and low-level governments. See e.g. Wheare (1953, p. 32-33). Recently, concern for strict division of authority has given way to scholarship that recognizes the importance of communication between levels of government. See e.g. Grodzins (1960, 1966) and Elazar (1962).

others decentralized.¹²¹ The choice to unify or fragment competences between regulatory levels is often a consequence of the more general decision to centralize or decentralize, for instance, most issues for which norms are set at the European level will be implemented and enforced at the decentralized national level due to subsidiarity concerns. Pre-existing constitutional arrangements may dictate the allocation of competences at certain levels.¹²² Distinguishing between different competences, we are left with a number of (de)centralization combinations, which can be mapped as in Figure 1.

	Norm Setting	Implementation	Enforcement
Centralized	N _C	I _C	E _C
Decentralized	N _D	I _D	E _D

Figure 1: Competence Allocation Choices

In respect of each competence, one can then choose to centralize or decentralize. Depending on these choices, we will see a unified or fragmented system of competence allocation. Since current regulatory frameworks often encompass more than two governance levels, the terms decentralized and centralized will only be used in general discussions, as soon as more than two levels of governance are involved, they will be referred to by name, e.g. international, regional, or national.

C. Normative Trade-offs

The economic theory of federalism identifies several ‘conditions’, or circumstances, under which decentralization may be preferred over centralization or vice versa. The key considerations that can be distilled from the economic theory of federalism refer to (i) the level of heterogeneity of the conditions and preferences in different localities; (ii) the presence of externalities; and (iii) the potential to achieve economies of scale and/or scope.¹²³ We can supplement these considerations

¹²¹ The assignment of all competences to the same level of governance will not preclude a fragmentation of these competences among different actors at that same level. Justification of this practice may be found in the separation of powers doctrine as first developed by Montesquieu. See Montesquieu (1748).

¹²² Such as the principle of subsidiarity in the European Union, see Treaty on the European Union (2008), art. 5(3). Despite the apparent presumption against centralization of regulatory competences, empirical studies have shown an increase in centralization since the incorporation of the subsidiarity principle into the European Treaties. See Carbonara, Luppi and Parisi (2008). Comparable constitutional arrangements exist in most federal systems, for instance in the United Kingdom. See Scotland Act (1998), section 54, section 98 and Schedule 5 (Reserved Matters) and Schedule 6 (Devolved Issues) (set out the legislative issues which are reserved or devolved to the Scottish legislator by the British government, reserved matters include foreign affairs, defence, and the registration and funding of political parties).

¹²³ Aside from the combination that we propose based on the economic theory of federalism, numerous other trade-offs are possible. See e.g. Inman and Rubinfeld (1997), at 44 ([T]hose who value a federal system

by taking into account the system's ability to minimize the risks of 'wrong' decisions regarding the optimal level of policy aims. However, the identification of these considerations only provides us with a trade-off; the optimal division of competences between different levels of governance depends on how these considerations are weighed against each other. Put differently, we must decide how much weight to give to the competing normative criteria in order to use them as a motivation, and standard, for competence allocation decisions.¹²⁴

In this section, we will show that the weighing of these considerations depends on (a) the type of regulatory problem; and (b) the regulatory tool used. The former is especially relevant in determining to what extent the presence of externalities may override the need to accommodate heterogeneous circumstances, whereas the choice of regulatory tool affects the possibilities for economies of scale and/or scope and regulatory cost more broadly. Moreover, regulatory tools that allow for (a high level of) differentiation can help to accommodate heterogeneous conditions and preferences, even if the regulatory problem is such that the capture of externalities through centralization was prioritized over a decentralized system that better accommodates heterogeneity.

1. Regulated Activity

The regulated activity, or the regulatory problem, has immediate bearing on the normative trade-offs mentioned above since its characteristics will determine which considerations are relevant and how they should be ranked *inter se*. The most important features, given the trade-offs already identified, are:

- (i) Does the regulated activity give rise to externalities, and if so, what is the geographical scope of the activity's effects?
- (ii) Are the causes and/or effects of the regulatory problem uniform across regions?

Aside from these two questions, there are several other characteristics of the regulatory problem that will be relevant for determining the optimal regulatory action but some of these may relate more directly to the type of regulatory instrument rather than the regulatory level at which competences must be allocated, i.e.:

- (iii) What information is needed to regulate this activity?¹²⁵ Is it the information more costly to gather at the central, rather than local level?¹²⁶

typically do so for a mix of three reasons: it encourages an *efficient* allocation of national resources; it fosters *political participation* and a sense of the democratic community; and it helps to protect basic *liberties and freedoms*.'). The trade-off between efficiency and equity (distributional or otherwise) will not be part of the analysis of this paper. See e.g. Revesz and Stavins, 499, 507 ('The consensus, at least within the realm of environmental policy, is that efficiency and equity ought to be evaluated separately, but there is no consensus on specific criteria that might be used to rank alternatives from an equity perspective.'). See also Revesz and Stavins, *infra*, 508 onwards (detailed discussion of cost-benefit analysis in the context of environmental regulation).

¹²⁴ See Goulder & Perry (2008), at 1 ('Beyond the theoretical and empirical challenges involved, there is a sobering conceptual reality: the absence of an objective procedure for deciding how much weight to give to the competing normative criteria.').

¹²⁵ Hahn (1989), at 111 ('It might seem, for example, that if the problem is local, then the logical choice for addressing the problem is the local regulatory body. However, this is not always true. Perhaps the problem may require a level of technical expertise that does not reside at the local level, in which case some higher level of government involvement may be required.')

¹²⁶ See e.g. Adler (2007), at 77 ('Environmental knowledge, like economic knowledge, is highly decentralized. Specific knowledge about local ecological conditions [...] is more likely to be found at the local level

- (iv) Are the negative effects of the activity immediate or delayed?

2. Regulatory Tool

Once the decision has been taken to regulate a given activity to achieve a set regulatory norm, the regulator must decide which instrument to use. In opting for a certain regulatory tool, a rational regulator will primarily consider (a) the nature of the regulated activity (e.g. the type of damage – local or interjurisdictional, dispersed or concentrated, immediate or delayed –, the number of regulated parties, heterogeneous or homogeneous compliance costs), and (b) the costs of certain types of regulatory tools, which we argue partly depend on the allocation of responsibilities across different regulatory levels.¹²⁷ Very few attempts have been made to incorporate instrument choice into a comprehensive discussion on (de)centralization.¹²⁸ Yet, instrument choice is highly relevant for the choice to (de)centralize since it impacts on:

- (i) The ability of the regulatory system to accommodate *heterogeneous (conditions and) preferences* in terms of the regulated activity: The amount of discretion left to the implementer and enforcer in their respective tasks may differ depending on the regulatory tool, which can be a way to ‘customize’ a more general regulatory norm, and
- (ii) The ability of the regulatory system to accommodate *heterogeneous conditions* with respect to the *regulatory costs*: Regulatory and compliance costs are influenced by the choice of regulatory tool,¹²⁹ as well as by the allocation of competences at a certain regulatory level (e.g. in terms of the ability to realize economies of scale/scope).

Put differently, instrument choice may help to accommodate the different conditions and preferences of localities when norm setting has been centralized due to e.g. the presence of externalities (effect (i)). It may furthermore help to increase the cost-effectiveness of regulation, especially for those costs made by the regulator; the central implementation of a tool that requires large amounts of local information will be less cost-effective than the local implementation of that same tool. However, if the decentralization of implementation is not possible, or desirable based on other markers, the choice for a different tool may accommodate this heterogeneity in costs (effect (ii)).

A crucial preliminary assumption that must be made explicit is the place of instrument choice within the regulatory chain, i.e. at which stage – norm setting, implementation or

than in a centralized bureaucracy. Due to the decentralized nature of knowledge, one might expect that environmental protections would be adopted first in those areas where local knowledge about the need for such protection is the greatest.’) See also Huffman (2005), 1378 (Huffman observes “enforcement is inherently local”).

¹²⁷ At this point, we do not consider the motivations of the regulator stemming from capture or voting behaviour. For this aspect of the regulatory decisions, see Section III.

¹²⁸ See e.g. Inman and Rubinfeld (2000) (arguing that decentralization is often the more efficient type of regulation in terms of regulatory costs); Hahn (1989), at 111 (‘In addition to selecting an appropriate mix of instruments, attention needs to be given to the effects of having different levels of government implement selected policies.’).

¹²⁹ See e.g. Friedman et al. (2000), at 356 (‘Another measure of cost-effectiveness is at the firm level – that is, whether the instrument allows a firm to minimize its costs for compliance’).

enforcement – the regulatory instrument is chosen. In our framework, instrument choice is considered part of the implementation process, since it forms part of the secondary norms that are needed to shape the regulatory system.¹³⁰ That said, in the norm-setting phase, some parameters may already be set for instrument choice, e.g. a number of different tools is selected from which the implementer may then choose to apply one or several.¹³¹ Another important reservation that must be made before discussing the role of specific instruments is that we assume that only one method of regulation is employed to deal with a specific regulatory problem. Often several instruments are employed to deal with the same regulatory problem, especially if the regulatory problem is particularly complex and encompasses several market failures.¹³² This may result in – positive and/or negative – interactions between the different tools. Although this is an important aspect of instrument choice, it goes beyond our point of the interaction between competence allocation and instrument choice, which is why we assume the use of one method of regulation, rather than a combination of tools.

Regulatory tools are commonly divided in two groups, placed on opposing sides of the regulatory spectrum:¹³³ command-and-control regulation (such as technology standards and performance standards) and market-based regulation (such as taxes and tradeable permits).¹³⁴ Command-and-control regulation is easily the most widespread type of regulation, used in various forms in most areas of regulation.¹³⁵ As a group, command-and-control regulation broadly covers all regulation that is founded in the prohibition or prescription of specific behavior, for instance through permits.¹³⁶ Of market-based instruments, taxes and tradeable permits are most common.¹³⁷ The aim of market-based instruments is to harness the potential of economic incentives and market dynamics in order to induce the potential violator/polluter to behave in the public interest.¹³⁸ Market-based regulation is also often referred to as ‘incentive-based’ regulation, which is arguably more inclusive (not all market-based regulation makes use of a ‘market’) but also inaccurate: both

¹³⁰ See also Shapiro (2000) at 325 (‘Agencies cannot easily obtain the information necessary to determine which instrument minimizes implementation costs.’)

¹³¹ This is for instance the case in the context of the United Nations Framework Convention on Climate Change. (1994).

¹³² See generally Goulder & Perry (2008).

¹³³ See e.g. Stavins, (1998); Driesen (1998); Goulder et al., (1999); Conrad & Schroder, (1993); Nicolaisen et al., (1991), Spulber, (1985).

¹³⁴ For a discussion of further types of regulation, see Friedman et al. (2000), at 333-43.

¹³⁵ Stavins (1997), at 326 (‘[W]e may reflect on the fact that despite thirty years of normative arguments from economists, the U.S. political system has typically taken a command-and-control regulatory approach, rather than an economic incentive-based approach to environmental problems.’)

¹³⁶ These mandates may take numerous shapes, including for instance: obligation of notification, authorization, prohibition and obligation to act. For a description of these instruments, see Krämer (6-ed., 2007), at 65-69.

¹³⁷ See generally Tietenberg (2006); Stavins (1997), 302-312 (overview of market based policy instruments). On permit trading, see e.g. Van Dyke, (1991); Marchant, (1992); Stewart, (1997); Pedersen, (2004); Nordhaus & Danish, (2005); Velin Kefer, (2001). On the use of regulatory taxes, see Yandle, (2002); Verchick, (2001); Swenson, (1987); AGORA, (1992); Elliott, (1985); Keohane, Revesz and Stavins, (1998). See also Krämer, (2007), at 73-74 and 340-34 (for a general discussion on the introduction of tradable permits in European environmental regulation).

¹³⁸ Pigou (1920) (introducing corrective taxes to discourage activities that generate externalities), Dales (1968) (showed that transferable property rights could be used to protect the environment against lower aggregate costs than command-and-control regulation); see also Hahn (1992), at 464.

command-and-control regulation and market-based regulation use incentives (positive or negative) to change the behavior of regulated parties.

Given our focus on the European Union Emissions Trading Scheme, emissions trading will be taken as the benchmark case of the interaction between instrument choice and (de)centralization. In brief, this regulatory tool has these following characteristics: under *tradeable permit* programs, regulators set a *cap* that places an absolute limit on aggregate emissions for certain sectors.¹³⁹ This cap is subdivided in a number of tradeable permits that entitle the holder to emit a certain amount of e.g. CO₂, SO₂, or NO_x equivalent.¹⁴⁰ All actors included in the system are assigned a number of permits, either through grandfathering (which means that the permits are given away for free),¹⁴¹ or through auctioning. Once the initial allocation has taken place, the parties can *trade* the permits on the relevant market if they wish to emit more or less than permitted through their initial allocation.¹⁴²

Effect (i): Ability to Accommodate Heterogeneous Conditions and Preferences regarding the Regulated Activity

When the decision has been taken to centralize norm setting, for instance due to the presence of externalities, Oates' Decentralization Theorem suggests that this centralization must result in uniformity with respect to the norms for different sub-regions.¹⁴³ There are many real life examples to suggest that this presumption of uniformity does not hold in practice. However, even if we were to assume that centralized norm setting will result in a lessened ability to take account of heterogeneous conditions and preferences of different regions that fall under the central regulator's jurisdiction,¹⁴⁴ this problem can be (at least partly) resolved through instrument choice. Depending

¹³⁹ See e.g. Coase (1962); Dales (1968a) and (1968b); Baumol and Oates (1971); Montgomery (1972); Hahn and Noll (1982).

¹⁴⁰ Aside from emission trading schemes that are focussed on pollution reduction, one may also consider the system of fishing quota's that is in force in most parts of the world. Under these schemes, a maximum quota is imposed which is then divided between the different fishermen in a certain region or fleet. See e.g. European Commission (2007c).

¹⁴¹ Woerdman et al. (2008).

¹⁴² Jaffe, Ranson and Stavins (2009) ('A cap-and-trade system constrains the aggregate emissions of regulated sources by creating a limited number of tradable emission allowances, which emission sources must secure and surrender in number equal to their emissions.');

Tietenberg (2003) ('In an emissions trading or cap-and-trade scheme, a limit on access to a resource (the cap) is defined and then allocated among users in the form of permits. Compliance is established by comparing actual emissions with permits surrendered including any permits traded within the cap.');

Stavins, (2001) ('Under a tradable permit system, an allowable overall level of pollution is established and allocated among firms in the form of permits. Firms that keep their emission levels below their allotted level may sell their surplus permits to other firms or use them to offset excess emissions in other parts of their facilities.')

¹⁴³ Oates (1972). See also Buzbee (2010), at 17 (Arguing that pre-emption by the federal government in the area of environmental protection and especially climate change would negate the many advantages of state involvement in environmental regulation and may eventually lead to regulatory failure.) ('Institutional diversity retaining federal, state and local roles would be more stable and conducive to market and regulatory innovation').

¹⁴⁴ See e.g. Butler and Macey (1996), at 23-66, 27 (critiquing the centralization of environmental regulatory authority to the federal level in the United States and arguing for reform through market-based regulation, economic property rights or greater state control.) ('We conclude that, in every area of pollution, environmental regulation has been centralized beyond any possible justification, resulting in tremendous costs.'). See Adler, at 137. ('[T]he ecological and economic diversity of the nation requires local knowledge and expertise that is often unavailable at the federal level. A more decentralized system is better able to overcome this "knowledge problem" and ensure that regulatory measures take account of local conditions.'). See also Butler and Macey, *infra*, at 27

on the actual design of an emissions trading scheme, there will be much room to accommodate differences in conditions and preferences in sub-regions. If a region may decide independently how to distribute the reduction obligations of the central cap among different local industries, heterogeneity between localities can be fully observed.

Effect (ii)(a): Accommodating Heterogeneous Administrative Costs

In order to successfully implement and enforce regulation, information is needed about the nature of the regulatory problem, the regulated parties and their behavior. The costs of obtaining this information vary depending on, e.g. the relative distance between the regulator and the regulated parties/problem, the number of regulated sources, the complexity of the regulated activity, and the expertise of the regulator in a given area. Economies of scale and scope may occur through the centralization of scientific research and decision-making. Also, economies of scope occur when policies reinforce each other, provided that the central regulator is aware of the most important environmental policies within the jurisdiction. The information needed to create policy is different in nature from that which is needed to implement or enforce it. It has been argued that the economies of scale that are achieved through centralized policymaking are dwarfed by the diseconomies of scale in centralized administration of these rules.¹⁴⁵ Another issue that is frequently raised with respect to information costs is that the information needed to ascertain compliance is predominantly 'local', making centralized enforcement potentially costly.¹⁴⁶ The extent to which this is true depends on the type of information needed, the method of information collection, and whether economies of scale may be achieved. Increasingly, improved technological methods of data collecting and the harnessing of private parties' knowledge are used to reduce these regulatory costs.

The preference of many economists for these market-based instruments is based on the fact that economic theory suggests a much higher cost-effectiveness of these tools as compared to command-and-control regulation.¹⁴⁷ However, the theoretical cost-effectiveness of market-based

("Federal regulators never have been and never will be able to acquire and assimilate the enormous amount of information necessary to make optimal regulatory judgments that reflect the technical requirements of particular locations and pollution sources."). Some have even argued that this is the case regarding air pollution, which is typically considered a transboundary problem. See Dwyer (1995), at 1218 (noting that "[t]he knowledge necessary to administer any air pollution control program...can be found only at the local level.") See also Kimber (1995), at 1658, 1661.

¹⁴⁵ Butler and Macy (1996), at 145 ("[W]hatever economies of scale associated with the centralization of environmental policy, they are surely overwhelmed by the diseconomies of scale in centralized administration.").

¹⁴⁶ Adler (2007), at 77. ("Environmental knowledge, like economic knowledge, is highly decentralized. Specific knowledge about local ecological conditions [...] is more likely to be found at the local level than in a centralized bureaucracy.") See also Huffman (2005), at 1378 (Huffman observes that "enforcement is inherently local").

¹⁴⁷ See e.g. Buchanan and Tullock (1975), at 1 ('Economists agree on the superior efficacy of penalty taxes as instruments for controlling significant external diseconomies which involve the interaction of many parties. However, political leaders and bureaucratic administrators, charged with doing something about these problems, appear to favour direct controls.'). Richards (2000), at 222 ('One consistent message from the environmental economics literature is that incentive-based instruments are more cost-effective means to achieve environmental goals than alternative policy instruments such as technology-based standards.'). See also Stewart (2010), at 9 ('Because of the dysfunctions encountered by governments in attempting to extend and intensify command and control requirements to meet increasingly ambitious regulatory goals, many developed and some developing

instruments is often not achieved in practice.¹⁴⁸ The implementation of these mechanisms may prove equally challenging as that of command-and-control regulation since a market may need to be established,¹⁴⁹ or a tax rate determined. Moreover, especially in case of market-based instruments, sophisticated monitoring and administration is needed, which is costly.¹⁵⁰ For both types of regulatory tools, the type of information needed for implementation and enforcement is an important factor in deciding whether centralized or decentralized competence allocation is preferable. Economies of scale may be achieved in standard setting and information gathering, but enforcement may prove most cost-effective at the decentralized level. In the most basic model, emissions trading and taxes are symmetric in terms of their cost-effectiveness but when faced with actual implementation and enforcement, significant differences appear.¹⁵¹ In short, (de)centralized norm setting, implementation or enforcement of these different tools will affect the administrative costs involved, and the extent to which this is the case depends on the type and amount of information that is needed.

Effect (ii)(b): Accommodating Heterogeneous Compliance Costs

If one is faced with heterogeneity of regulated sources and corresponding differences in abatement costs (such is the case with climate change), command-and-control regulation in the form of technology standards may be overly rigid and give rise to excessive compliance costs.¹⁵² One of the key theoretical advantages of tradeable permits (or 'emissions trading') is the fact that regulated parties (a company or installation) have the flexibility to make a situation specific calculation regarding the marginal abatement cost and can decide to buy allowances or abate

countries have adopted market-based and information-based regulatory instruments as a supplement or alternative to traditional approaches.').

¹⁴⁸ Hahn (1989), at 107 (stresses that most market-based instruments are implemented based on existing regimes, which explains a lot of the difficulties. It also means that their cost savings is generally a lot lower than their theoretic potential.); Hahn (1990), at 28 ('As several scholars have noted, emissions fees are rarely implemented in ways even remotely resembling their pure form. Consequently, this instrument choice comparison may not be terribly revealing.')

¹⁴⁹ Hahn (1989), at 96 ('Naturally these results are subject to the usual cautions that a competitive market actually must exist for the results to hold true. Perhaps more importantly, the results assume that it is possible to easily monitor and enforce a system of permits or taxes.')

¹⁵⁰ Hahn (1992), at 467 ('Much of the work on markets and emission taxes assumes that there is a reasonably sophisticated environmental control agency that can administer incentive-based programs. '); Shapiro and McGarity (1991), at 748-49 ('Emissions trading [...] require[s] inspectors to monitor constantly the amount of pollution that a plant emits.')

¹⁵¹ Seabright (1998), at 8 ('First, permits fix the level of pollution control while charges fix the costs of pollution control. Second, in the presence of technological change and without additional government intervention, permits freeze the level of pollution control while charges increase it. Third, with permit systems as adopted, resource transfers are private-to-private, while they are private-to-public with ordinary pollution charges. [...] permit systems may be more susceptible to strategic behaviour, because of the barriers to entry that implemented forms of these systems frequently provide. [...] finally, in the presence of uncertainty, either permits or charges can be more efficient, depending upon the relative slopes of the marginal benefit and marginal cost functions and any correlation between them.')

¹⁵² See e.g. Scott (1998), at 36 (explaining that In case of extremely detailed and overly prescriptive standards, dynamic efficiency may suffer and reduce incentives for technical innovation or other cost effective responses, which can lead regulated parties to comply in the most minimal way with the set standards.); Lee (2001); Holder and Lee (2007), at 417; Sunstein (1994) (labelling command-and-control regulation as 'futile and self-defeating'). See also Driesen (1998), at 289-350 (in-depth discussion of critiques of command-and-control). See generally on the inefficiency of C&C regulation: Tietenberg, (1985); Ackerman and Stewart (1985); McGartland and Oates (1985); Stewart (1985). See also Hepburn (2006).

based on this calculation. This flexibility should lead to a lower overall cost of abatement and the correct allocation of abatement costs to the companies or actors who have lowest marginal abatement costs.¹⁵³ In theory, either price-based (taxes) or quantity-based instruments (permits) can be used to meet an abatement goal at the same marginal price, provided there is perfect information.¹⁵⁴

D. Allocating Competences

What does the above imply for the normative trade-off between (i) the level of heterogeneity of the conditions and preferences in different localities; (ii) the presence of externalities; and (iii) the potential to achieve economies of scale and/or scope? The nature of the regulated problem should be considered paramount in deciding which criteria should rank first, and which should come second. If the problem is inherently local, without any externalities, accommodating interjurisdictional differences in conditions and preferences will be the first-order consideration out of the three. Instrument choice can then be used to minimize regulatory costs and achieve economies of scale and/or scope. Conversely, if the problem is a transboundary one, the capture of externalities will be the first order consideration, and the accommodation of heterogeneity and realization of economies will be second order. Also here, clever instrument choice may help optimize second order considerations. Since each competence represents a different step in the regulatory process, these considerations typically do not apply to each competence in the same way. For instance, the externalities caused by the regulated activity may have been captured through the norm setting process, which would make the accommodation of heterogeneous conditions and preferences more important considerations for the implementation and enforcement stages.

¹⁵³ See e.g. Weitzman, (1974).

¹⁵⁴ See Richards (2000), at 244; Weitzman (1974), at 480 ('In an environment of complete knowledge and perfect certainty there is a formal identity between the used of prices and quantities as planning instruments.') Cf. Hahn (1989), at 108 ('On the whole, there is more evidence for cost savings with marketable permits than with charges.') Hahn argues that this is due to the different role that taxes and permits play in meeting environmental objectives, since charges are used primarily to improve environmental quality by redistributing revenues, whereas marketable permits are used primarily to promote cost savings.

III. INTERACTING JURISDICTIONS: CONSEQUENCES OF FRAGMENTATION

Thus far, we have discussed the optimal allocation of competences through focusing on each competence individually. The underlying assumption that these competences, and the agencies to which they are allocated, in fact function independently of each other is reconsidered in this part of our theoretical framework, where we look at potential interactions between agencies. Competence allocation decisions can result in a unified or fragmented regulatory system. In case of a unified system, we assume there are no strategic interactions: there will either be a single regulator exercising all competences or a number of different regulators whose actions are perfectly coordinated. In case of fragmented competence allocation, we assume that interactions will take place, which may undermine the considerations that led to the specific allocation of competences. This could in turn necessitate a change in the competence allocation that was considered optimal based on the relative (dis)advantages of (de)centralization of the individual competences considered in isolation. In sub-section A, we consider how the type of regulatory agency, e.g. a benevolent as opposed to a rent-seeking agency, will affect the interaction between different types of competences. For this interaction, the nature of the authority allocated with the agency must also be determined. Sub-section B discusses how instrument choice affects the possibility for competences to interact, especially with respect to the externalization of certain costs.

A. *Interacting Regulators*

In our competence allocation analysis, we set out a number of considerations that guide our decision to allocate certain competences at a specific regulatory level. The consequent allocation decisions are based on, among other things, the specific characteristics of the norm setting, implementation and enforcement process, and made for each competence independently. The combination of these individual competence allocation decisions can result in either a 'unitary' or 'fragmented' system.¹⁵⁵ In the former, all competences are assigned to the same level,¹⁵⁶ whereas

¹⁵⁵ In the existing literature, a (competitive) interaction between regulatory agencies or levels is typically discussed as a manifestation of the constitutional framework underlying a specific federalist system, and/or refers to the competence to regulate a specific policy area as a whole, rather than to specific competences (competing jurisdictions). See *generally* Corwin (1950) (introducing the term cooperative federalism); Elezar (1962) (introduces the idea that dual federalism is no longer applicable to the federal relationships in the United States but rather cooperative federalism); Grodzins (1966). More recently, see Zimmerman (2001), at 30 ('[T]he postulates of a more general federalism theory of national-state relations include dual, cooperative, and coercive elements, and emphasize the importance of the national political process to states and their political subdivisions in preventing enactment of or obtaining relief from preemption statutes, their implementing rules and regulations, and mandates and restraints, protection against the exercise of coercive powers by Congress, and enactment of statutes desired by states.') For federalist work on systems other than the United States, see Watts and Hobson (2000). For environmentally based empirical work, see Sigman (2005), at 96: '[M]y empirical results suggest that federal standards do not prevent free riding. Allowing states discretion in implementation and enforcement of standards appears to be sufficient for free riding to continue. Second, problems with free riding must be weighed against the benefits of decentralization. Because free riding costs only \$ 17 million, it may not overcome the greater flexibility and informational advantages of decentralization. In addition, the optimal response to free riding may not be centralization, but rather decentralization in combination with more targeted responses to spillovers. [...] Finally, free riding may not be detrimental if pollution control policies are inefficient. Recent studies suggest that CWA may not pass a cost-benefit test. If so, the observed free riding could provide a net benefit by reducing overcontrol of pollution.'

a fragmented system is characterized by an allocation of competences to different regulatory levels.¹⁵⁷ Broadly speaking, we can distinguish between two types of agencies: benevolent and rent-seeking agencies.¹⁵⁸ A regulator that is acting benevolently (and with full information) may be assumed to act in a social welfare maximizing way.¹⁵⁹ Conversely, rent-seeking set out to create value for themselves, which is likely to lead to socially inefficient regulatory outcomes.¹⁶⁰ Both characteristics are considered to be social welfare diminishing and should therefore be mitigated.¹⁶¹ Depending on the type of agency, fragmentation may mitigate or aggravate some of the inefficiencies caused by rent-seeking agencies.

For the purpose of the type of interactions that we will focus on in this section, we assume that the preferences of different actors functioning at the same regulatory level are perfectly aligned. Put differently, we assume that in case of unified allocation, all agencies are the same type, whereas in fragmentation, there can be as many different types as there are regulatory levels. This is not a necessary consequence of fragmentation; the type of agency is an exogenous factor, independent from the type of competence allocation.

A first best scenario would assume a benevolent agency with full information. In this case, the allocation of competences can be based purely on the (dis)advantages of (de)centralization of the individual competences since there will be no distortions by the agencies as their actions are fully informed and welfare maximizing. For the other types of agencies, certain types of allocations are better than others, depending on the type of regulatory authority exercised by the agency, and the relationship between the competences. Parisi et al. formalized these relationships in a model, which considers the welfare implications of the institutional environment of competence allocation.¹⁶² In their model, 'regulatory competence' refers to an agency's ability to e.g. permit or restrict a certain activity, rather than a specific step in a larger regulatory chain. The following subsection will set out the main findings of their model, some of which inspire our intuitions about interactions regarding competence allocation.

¹⁵⁶ We recognize that in case of unitary competence allocation, competences may still be allocated to different actors at the same regulatory level.

¹⁵⁷ Assuming two levels of governance – centralized (C) and decentralized (D), six different fragmented scenarios can be constructed as the vectors (C, D, C) (C, C, D) (C, D, D) (D, C, C) (D, D, C) and (D, C, D).

¹⁵⁸ Parisi, Schulz, and Klick (2006), at 63-4. (They identify one additional group of agencies, so-called shirking agencies, which lack sufficient incentives to intervene or regulate, which will lead to an inefficient level of regulation. We will focus on rent-seeking and benevolent agencies since these two categories cover the vast majority of agencies in our regulatory context of climate change and helps reduce the complexity of our analysis.)

¹⁵⁹ Social welfare refers to the overall welfare of society. See Sen (1963), at 771-78; Sen (1982); Samuelson (1947); Arrow (1951, 2nd ed., 1963); Bator (1957).

¹⁶⁰ See e.g. Bowman (2004), at 544, on horizontal interstate cooperation in the United States, arguing that this cooperation can offer an alternative to federal legislation. Finds that the cooperative aspect of horizontal federalism is relatively unstable: 'more capable states cooperate by engaging in multistate legal action, and less capable states cooperate by adopting uniform state laws'. Moreover: 'Because self-interest is the impetus for state action, the likelihood of coordinated, collaborative action across the fifty states is always problematic.' (at 545).

¹⁶¹ The determination as to whether an agency is a certain type is an empirical question, which must be decided for each individual regulatory context. See e.g. Yang (2006), at 1156 ('As a public good, treaty enforcement must overcome collective action difficulties in getting states to contribute to the cost of enforcement.')

¹⁶² Parisi, Schulz, and Klick (2006).

1. Regulatory Competition

Parisi et al.'s model of regulatory competition distinguishes between positive and negative types of regulatory authority (i.e. different effects of regulatory action), and between alternative and concurrent regulatory competences (i.e. ways in which different competences relate to each other).¹⁶³ Positive authority refers to the permitting of a certain activity that would otherwise be restricted, whereas negative authority involves the restriction of an otherwise permissible activity.¹⁶⁴ In case of alternative competences, an action of 'one among multiple bodies is sufficient to give effects to a regulatory act':¹⁶⁵ i.e. an 'either/or' situation. In case of complementary competences, all regulatory agents must choose to e.g. permit or restrict an activity in order for the regulatory act to take effect:¹⁶⁶ i.e. an 'and/and' situation.

Given these parameters of regulatory activity and competences, regulatory competition between agencies takes place based on the possibility of rent-extraction. Rent-extraction is a positive externality which one regulatory agent creates for another by taking a certain course of action. For instance, in case of a positive authority and concurrent competences, the approval of a permit by one regulator increases the value of the second approval for the applicant, which in turn increases the exploitable rent for the second regulator.¹⁶⁷ One can also imagine circumstances where the exploitable rents for the second agent are reduced, for instance in case of positive authority coupled with alternative competence, where the approval by one agent destroys the rents for the other agent: a negative regulatory externality. Generally speaking, in case of alternative competences, the decision of one regulator to permit or restrict an activity destroys the exploitable rent of the other competence holder since the activity can only be permitted or restricted once. If on the other hand, the competences are concurrent, the activity can only be permitted if all regulators agree, which means that the approval of the 'first' competence holder increases the exploitable rent for the second regulator.

From this follows that regulators will seek to maximize their rents through over- or under-regulation of a certain activity: in situations of alternative competence, agencies will exercise their regulatory power more than optimal from the point of view of the regulators' joint interests, and less than optimal in concurrent competence situations.¹⁶⁸ The answer to the question as to whether this over- or under-regulation is welfare improving or diminishing goes back to the type of agency we are dealing with.

The welfare implications of competence allocation to benevolent and rent-seeking agencies under the Parisi et al. model are summarized in Table 1. The welfare outcomes under different competence allocations are ordered relative to the baseline of unified regulatory

¹⁶³ Parisi, Schulz, and Klick (2006), at 58. See also Buchanan and Yoon (2006), and Buzbee (2003) ('The regulatory commons dynamic creates analogous disincentives [to the tragedy-of-the-commons] for potential regulators to make such political investments where a regulatory opportunity is shared by many.') (Arguing that these dynamics may give rise to regulatory gaps rather than over-regulation.)

¹⁶⁴ Parisi, Schulz, and Klick (2006), at 57.

¹⁶⁵ Parisi, Schulz, and Klick (2006), at 58.

¹⁶⁶ Parisi, Schulz, and Klick (2006), at 58.

¹⁶⁷ For other examples see Parisi, Schulz, and Klick (2006), 59 onwards.

¹⁶⁸ Parisi, Schulz, and Klick (2006), at 61.

competence (W_0). The first two rows assume that the allocation of competence (in the sense of the competences being alternative or concurrent) is held fixed, and only the type of authority may be chosen. The third and fourth rows assume the opposite. From this follows that, for example, the first line under rent-seeking agencies should be read as stating that: assuming there are rent-seeking agencies with alternative competence, positive authority (W_P) is welfare increasing as compared to a unified (W_0) or negative authority (W_N), whereby unified allocation is preferred to negative authority. In case of benevolent agencies, we find that unified allocation is always welfare improving over a fragmented system.

	Welfare results	
	Rent-seeking Agencies	Benevolent Agencies
Alternative competence	$W_P > W_0 > W_N$	$W_0 > W_P \quad W_0 > W_N$
Concurrent competence	$W_N > W_0 > W_P$	$W_0 > W_P \quad W_0 > W_N$
Positive action	$W_A > W_0 > W_C$	$W_0 > W_A \quad W_0 > W_C$
Negative action	$W_C > W_0 > W_A$	$W_0 > W_A \quad W_0 > W_C$

Table 1: Welfare Implications¹⁶⁹

2. Interacting Regulatory Competences

The Parisi et al. model is highly informative but there are certain ways in which it does not fit our framework of competence allocation. First of all, we distinguish between three different competences, which, under a fully fragmented system, result in two sets of interactions: one between the norm setter and the implementer, and one between the implementer and the enforcer.¹⁷⁰ Secondly, we find that the nature of the regulatory competences dictates the nature of the relationship between them, i.e. whether they can be considered alternative or concurrent. In the Parisi et al. model either the nature of the regulatory activity or the type of competence can be taken as exogenous.¹⁷¹ In our framework of competence allocation, the relationship between the competences is endogenous. In addition, the relationship between implementation and enforcement is imperfectly alternative/ concurrent.¹⁷² Implementation and enforcement are not

¹⁶⁹ Adapted from Parisi, Schulz, and Klick (2006), at 64.

¹⁷⁰ We do not consider the possible feed-back effect between the enforcer and the norm setter. A further possible extension is that due to the content of the competences, enforcement action necessarily follows implementation, and implementation follows norm setting, i.e. the actions are sequential, not simultaneous. If we were to formalize this situation in the same way as the Parisi et al model, we would have to account the fact that the authority exercised under implementation and enforcement are sequential rather than simultaneous, which may alter the Nash equilibria; and, we would have formalize the effect of the interaction between norm setting and implementation on that between implementation and enforcement.

¹⁷¹ Parisi, Schulz, and Klick (2006), at 64.

¹⁷² For norm setting and implementation the situation is closer to one of perfect complementarity: Under negative authority, the competence are imperfectly concurrent since a blanket restriction of behaviour would destroy rents. However, in most cases, norm setting determines to what extent the behaviour must be reduced or which behaviour must be prohibited, and the implementer determines to whom the prohibition applies, or which parties must restrict their behaviour.

perfectly alternative since the action to permit or prohibit by the implementer does not destroy all exploitable rents for the enforcer: under both positive and negative authority, the enforcer could choose to non-enforce against non-compliant behavior if provided with side-payments or other types of rents. However, since the enforcer cannot enforce against behavior that has not already been either permitted or prohibited by the implementer, the competences are also not concurrent.

Nevertheless, we may draw certain implications regarding the impact of competence interactions for norm achievement. Depending on (i) the type of regulatory agency, and (ii) the type of regulatory authority, the fragmentation of competences among different levels of governance can be welfare increasing or decreasing relative to a situation of unified competence allocation (see third and fourth line of Table 1). One of the implications could be that even if the fragmentation of competences is preferable based on the competence allocation considerations, unification may be welfare improving. The actual consequences of these interactions will depend on the specific regulatory context. In the next section, we consider to what extent instrument choice may influence the exploitability of certain rents.

B. Instrument Choice

The choice of regulatory tool is instrumental in the relationship between the implementer and the enforcer since it determines to what extent under- or over-permitting or restricting is able to take place.¹⁷³ With respect to enforcement, the pay-offs of enforcement agents are influenced by the (perceived) likelihood that implementers will detect or correct their (in)action. This problem will manifest itself differently depending on the level of governance: sovereign parties to an international agreement may be less respondent to pressure to enforce than states in a federal setting where there may be specific provisions for failure to enforce.¹⁷⁴ Regardless of the governance level, the two main factors that influence the relationship between implementer and enforcer are information and flexibility. These two factors are interrelated since tools that allow for a greater amount of flexibility are typically applied to more complex regulatory situations where the information is relatively asymmetrical.

Another important factor is the possibility to externalize certain regulatory costs onto others. For instance, the likelihood of under-enforcement is increased when the costs of this under-enforcement can be externalized onto other parties. In the case of fines that are paid to the enforcer and form part of that enforcer's budget, the pay-offs of non-enforcement in the form of rents has to be higher since the costs of non-enforcing the rents is the lowering of the enforcer's budget. Alternatively, when the enforcement takes the form of market-oversight, as is the case for

¹⁷³ The relationship between norm setter and implementer is not influenced in the same way by instrument choice since we assume that the implementer, not the norm setter, makes the choice of instrument. The norm setter may give a range of regulatory tools to choose from by this choice will not influence the relationship between the norm setter and the implementer in the way it does the implementer and enforcer relationship. Allowing for multiple interactions between the norm setter and the implementer, the range of regulatory tools allowed for by the norm setter could be influenced by the implementer/enforcer interaction once it becomes clear that certain instruments enhance sub-optimal results.

¹⁷⁴ See e.g. Lin (2010), at 13; Burniaux et al. (2009) (arguing that the difficulty of enforcing international rules against sovereign states makes international carbon trading dependent on negotiation and consensus building).

tradeable permits, the non-enforcement of certain types of market abuse will be externalized to other market participants, some of which may even be located out with the jurisdiction of the enforcer in case of an international market with national or regional enforcers. In this case, the pay-offs to the enforcer can be lower than in the case of fines since the costs of non-enforcement is externalized.

In general terms, it may be argued that the more a regulatory tool allows for flexibility at the side of the enforcer or the regulated party, the more likely it is that information asymmetries exist or are created. Flexible instruments are typically applied in situations where there is a high level of technical complexity, and/or heterogeneous circumstances among the regulated parties, which makes it difficult and costly to determine the right standard or type of activity for each party.¹⁷⁵ Depending on the relative levels of governance on which the implementer and the enforcer are active, the relative distance between the implementer/enforcer to the regulated party in these cases may mean that e.g. the implementer has relatively less insight into the activities of the regulated party, which plays into possible rent-seeking behavior at the enforcement level. The safeguards that can be put in place to limit these risks depend on the legal framework in which these competences are exercised, and the way in which competences have been delegated to different actors. Some forms of decentralization leave far more room for discretion than others, which will also influences the methods of oversight.

C. *Interacting Competences*

The theoretical framework developed in this section questions the existing approach to (de)centralization decisions, which fails to distinguish between different stages in the regulatory process. By differentiating between norm setting, implementation and enforcement, the distinctive characteristics of these processes are highlighted and a more precise recommendation of (de)centralization per competence can be given. These recommendations are based on the normative trade-off between accommodating heterogeneous conditions and preferences, capturing externalities, and maximizing economies of scale/scope, based on the economic theory of federalism and legal federalism scholarship. Whether this optimal allocation takes the shape of a fully (de)centralized allocation or a fragmented allocation among several levels of governance depends on the regulatory problem at hand, and the instrument used for its regulation.

Aside from the competence dimension, we also consider the role of interactions between these competences, taking account of different types of authority, and the alternative or concurrent nature of the regulatory competences. Instrument choice plays an important role with respect to interactions as well since it may mitigate or aggravate to what extent these interactions can play themselves out. Instruments with higher levels of flexibility and discretion, combined with information asymmetries make it more likely for interactions between the implementer and the enforcer to occur. The effect between the norm setter and implementer is less pronounced since we assume that instrument choice is part of the implementation stage.

¹⁷⁵ See Richards (2000), at 237 (on the allocation of regulatory and abatement costs).

The optimal allocation of competences across different governance levels will depend on the concrete regulatory context and the nature of the regulatory problem itself. In the next sections, we apply the theoretical framework to the regulation of climate change, in particular the mitigation of climate change through emissions trading.

[Excluded from current version due to length of paper:]

IV. THE EUROPEAN UNION EMISSIONS TRADING SCHEME: A CASE STUDY

CONCLUSIONS