

Knowledge Management for Legislative Drafting in an International Setting

Alexander Boer Radboud Winkels Rinke Hoekstra Tom M. van Engers

Leibniz Center for Law

Faculty of Law, Universiteit van Amsterdam

Amsterdam, The Netherlands

{aboer, winkels, hoekstra, vanengers}@lri.jur.uva.nl

Abstract. The processes of drafting consistent and coherent legislation and upholding and applying valid law are getting more and more complicated. In this paper we sketch the components of an integrated Knowledge Management architecture for Legislative Drafting and deployment of legislation in an international setting and discuss problems conceptual mismatches in legal vocabulary of competing legislative authorities. Such a support environment should at least provide the following functionalities: Management of references, version management, management of subsumption structures between concepts and norms, access to similar legal documents for ‘best practices’, and access to guidelines or norms about drafting. We identify the key problem of managing a large and complicated repository of legislation as the problem of comparing (models of) legislation.

1 Introduction

Increasing legal convergence between governments in the European Union, and traffic of people over borders of jurisdictions, leads to an increased interest in the problem of comparing and harmonizing legislation. Administrations need to know and understand legislation of friendly governments to be able to assist citizens and reduce negative consequences of movement. Global companies offer products and services in many jurisdictions at the same time, and the product or service has to meet the provisions of all jurisdictions in which it is offered. Different regulations can lead to differences in competitiveness for the product or service; For a financial product, for instance, it is considered important to qualify for tax deductions that make the product more attractive. For a medical product it is important to know whether it can be sold over the counter without a prescription.

This attention for comparing legal systems is evidenced by the number of consultancy firms that advertise their knowledge of multiple jurisdictions to companies. In addition, there are a number of initiatives – often initiated outside the Computer Science and Law community – for constructing international legal ontologies that expose the subsumption relations between legal vocabulary in multiple jurisdictions (e.g. [9]).

As a result the processes of drafting consistent and coherent legislation and upholding and applying valid law are getting more and more complicated. ICT has the potential of supporting both the government and citizens in dealing with this increasing body of law; In the E-POWER project¹ we tried to provide such support. A necessary precondition for ICT support is the electronic availability of legal documents from multiple sources in a structured and standard format. That is why we developed ^{META}Lex XML² (cf. [1]), and try to convince

¹IST project 2000-28125.

²See <http://www.metalex.nl>

legislators and legal publishers to adopt or facilitate it.

We also tried to use the available E-POWER ontologies for comparing ‘similar’ legislation from different jurisdictions. Employees of the Dutch Tax and Customs Administration – a member of the consortium – are increasingly confronted with requests that require them to understand European regulations and directives, and regulations of other EU member states, and they need to react to consequences of increased movement of people, products, and money between EU member states and increased harmonization between tax authorities in Europe.

In this paper we present some conclusions from our work on these subjects and try to sketch the components of an integrated Knowledge Management architecture for Legislative Drafting and deployment of legislation in such an international setting, based on an open source ^{META}Lex RDF repository. We will discuss problems of conceptual mismatches in legal vocabulary of competing legislative authorities. We identify the key problem of managing a large and complicated repository of legislation as the problem of comparing (models of) legislation.

2 Computer-assisted Legislative Drafting

Existing legislative drafting support software (cf. generally [5]; LEDA, Solon, LexEdit, Enact, etc.) is usually structured in accordance with legislation that regulates legislative drafting. This represents one important set of requirements for legislation, but many others are not explicitly taken into account. LEDA, for instance, included access to CD-ROM databases with existing legislation for reference purposes. Another category of software that claims to assist legislative drafting are legislative ‘databases’ or Content Management Systems (CMS; e.g. [4]). These projects stress that legislative drafting is a complex knowledge management task requiring access to many legal sources, but lack a coherent perspective on the role these other legal sources play in legislative drafting and offer nothing but norms about drafting to support decision making.

Most legislation builds on existing legislation and legal vocabulary. Legislative drafters take into account: information from the legislation to be replaced/amended (e.g. to decide on a transitory regime³); legislation that regulates legislative drafting; legislation that will interact with the new legislation; similar legislation from other jurisdictions; known alternative regimes from literature (or political discourse) relevant to the proposed legislation; information on external costs of changing to the new regime; and information on internal costs of changing affected (internal) business processes, decision support systems, knowledge management systems, training materials, etc.

In our view a knowledge management system for legislative drafting consists of a content management and a decision support component. We classify relevant relations between legal sources as follows:

Jurisdiction and Legislative Competence Legislators are restricted by higher and lower normative systems (municipal, provincial, national, EU, UN etc.; cf. the *lex superior* principle for resolving conflicts) and “connected” by open borders to other normative systems. Proof of legislative competence, and obligation to implement a directive, are very common reasons to cite other legislation.

Norms about drafting Legislation is structured in accordance with legislation that regulates legislative drafting. This legislation may itself change as a result of legislative drafting, of

³See <http://www.lri.jur.uva.nl/rinke/leidraad/leidraad.htm> for a manual (in Dutch) about transitory legislation designed by our department.

course. In addition, judgments of advisory councils (e.g. a “Council of State”) on previous drafts of the same law, or drafts of other laws, may be important (cf. [13]).

Language Legislation is sometimes designed in multiple language versions that must remain consistent.

Time Versions are important in deciding what is valid law for a particular case (legislation applicable at the time, and the *lex posterior* principle). Versions in time may be cited. Temporal relations between legal sources always exist, obviously.

Domain Legal sources may express norms about the same thing, and these norms may be in apparent conflict (resolved by the *lex specialis* principle). Legislation may use vocabulary classifying the domain from other legislation by citing it.

Comparability Any legal source considered ‘best practice’ in some sense or any alternative versions of legislation with which it can be compared to establish preferences.

Voermans ([13]) notes that the user-unfriendliness of knowledge representations make it unattractive to check the “deontological consequences of a draft”. We are not convinced. Given the amount of effort involved in drafting legislation, evaluating consequences, adapting systems and business procedures, and training civil servants, there is no viable argument from efficiency to avoid the formalization step if that results in better legislation. There is a very good reason to formalize at this stage: it makes all next steps less costly. In the fiscal context of E-POWER, for instance, new legislation has direct consequences for software that processes submitted information and detects fraud.

3 A Framework for Comparing Legislation

Evaluation of legislation is central to the task of legislative drafting: To build a knowledge management system for legislative drafters one needs to understand how legislation compares to its alternatives. Generally, a rhetorical comparison compares a thing A (the *primum comparandum*) to a thing B (the *secundum comparatum*) on the basis of a common quality C (the *tertium comparationis*): A is like B with respect to C, or A is as C as B. The comparison is limited to a common quality, or a limited number of common qualities, that are, or should be, known in advance.

Similar regulations are compared for a number of different purposes, and in most cases of comparison the surrounding legal system is assumed to be the same. We distinguish 3 types of comparison of regulations:

Comparison of alternatives Proposals for a regulation addressing the same problem are compared to judge which one is better according to preconceived norms of analysis.

Vertical comparison in time Versions of the same regulation in time are compared to determine the effects (costs and benefits) of changes of legislation on behavior, products, etc.

Horizontal comparison between jurisdictions Two regulations addressing ‘similar’ things in different jurisdictions are compared to inform others about the effects (costs and benefits) of moving themselves, their property, products, or services over the borders of a jurisdiction.

Costs and benefits for stakeholders are quantified and ranked with a variety of evaluation criteria, sometimes called “norms of analysis”. Norms of analysis are the norms used to distinguish good from bad norms (cf. generally [8, 7] in taxation context), and represent the values the legislator has committed itself to. These values can take the form of a preference scale that can be used to rank things. To distinguish good from bad legislation, one has to deal with the additional problem of aggregation of norms in regulations, and the aggregation of the results of application of multiple norms of analysis. Tax neutrality, for instance, is a norm of analysis that postulates that taxation should not create avoidance behavior. Tax neutrality is also a norm for distinguishing good and bad combinations of legislation in the context of migration; In this form it postulates that two jurisdictions that allow free movement between jurisdictions should try to minimize differences in tax pressure.

Comparative analyses made by scholars in Comparative Law that reveal “interesting” differences between regimes are usually based on “functional” similarity[12]. To create useful computerized support, the implicit evaluation criteria used to decide what difference is interesting, and what alternative is better, must be made explicit. If multiple criteria are used, and the ranking or composition of those criteria is omitted in a misguided attempt at modesty or ‘objectivity’, the comparison only results in “differences” without a judgment. Two variations of this “functional” character of similarity can be distinguished:

Outcome similarity Two regimes can be considered similar if they cause similar interesting outcomes for the group of agents affected by the respective regimes.

Intention similarity Two regimes can be considered similar if they are both intended by the legislator to cause similar interesting outcomes for the group of agents affected by the respective regimes.

If you make assumptions about the effect of codified norms on behavior without validating them, you are confusing intended outcome with actual outcome (cf. [2]).

4 A Knowledge Management System for Legislative Drafting and Deployment

A Knowledge Management System for Legislative Drafting is in essence a Decision Support System – just like expert systems that assist in applying the law. Legislative drafting is decision making. The simplest norms of legislative drafting we are interested in are the *formal* criteria of legislation for legislative drafting. These – and procedural norms to some extent – can be automatically applied. *Substantive* criteria (restricting the content of norms) work as norms of analysis – they serve to choose between alternatives – and are approached as source material for decision support features.

We designed a knowledge management architecture for ^{META}Lex based on a content management component and a decision support component. The content management component takes care of formal criteria, document-, and conceptual and evaluation model management. Because formal norms can also be amended, and old legislation can never be expected to meet the newest criteria, formal norms are declaratively expressed and not hardwired into procedures. The decision support component uses evaluation models declaring norms of analysis to assist in decision-making for legislative drafters as well as designers of expert systems and tutoring systems. The decision support system helps to deconstruct comparative arguments for legislative drafting, and exposes norms of analysis, questionable assumptions, and overlooked counter-examples.

4.1 Content Management with MetaLex XML

The *formal* requirements of for instance the Netherlands' Regulation for Legislative Drafting (Aanwijzingen voor Regelgeving; AR) can be encoded in a normative XML schema on top of META_{Lex}, or using an XSL verification sheet for META_{Lex}. However, the application of more complex norms of analysis requires insight into the *context* of the draft legislation within the body of legislation as a whole: both on a syntactical level and at a semantical level.

The META_{Lex} XML standard for legal sources provides a generic and easily extensible framework for encoding of the structure and contents of legal and para legal documents in XML (See [1]). It differs from other existing metadata schemes for legal documents in two respects; it is language independent and it aims to accommodate uses of XML beyond search and presentation services. The same content can be written down in one META_{Lex} document using multiple languages or in different documents using jurisdiction-specific sets of XML tags. By providing structure to legal texts, META_{Lex} facilitates search and filtering on legal documents. The use of four date attributes provides a comprehensive way to determine the validity and activity of any part of a legal text: date-enacted, date-repealed, date-publication and date-effective. These metadata enable automatic generation of current and past versions of legal texts, and control automatic resolution of references (to known persons, bodies or definitions of legal concepts) and citations (of structural elements of a text) over different versions.

A META_{Lex}-based CMS will allow for browsing and retrieval, publishing, import/ export to- and from open and proprietary formats. Most importantly, it can make explicit the structure of and relations between (elements) of regulations. This greatly enhances the possibilities for legislative drafters and end-users alike for version management and reference resolution, across languages, and through time.

Information about legal sources, including concepts, evaluation models, extensions to describe the content of regulations in a logic-based framework, and indices for advanced search techniques, is specified in RDF (W3's Resource Description Framework XML). The RDF data model is convenient because it is very expressive, and can be trivially serialized as XML or SQL for relational databases; Both are key technologies for CMS's.

META_{Lex} is transparent with respect to other XML-based languages, which makes it highly suitable for integration with existing Semantic Web standards (See Figure 1). In the context of harmonization and comparison of regulations, this means META_{Lex} can be built upon to venture beyond the mere syntactical aspects of legislation. The use of META_{Lex} and semantic web technologies within a CMS enables the classification of documents by role, authority, jurisdiction and competence, as well as conceptual model and evaluation model management.

4.2 Concepts in RDF and Open Borders

To illustrate the problem of open borders between jurisdictions we can take an example from the agenda of European Parliament; A recent initiative by the Hellenic Republic concerning the application of the "ne bis in idem" principle (double jeopardy; nobody shall be prosecuted twice for the same criminal offense) in EU treaties and proposes a total of 23 amendments to clarify what the "same criminal offense" is, and what should be considered a *res judicata* (a completed trial/prosecution) in different member states. To solve these problems between two jurisdictions a third legislative authority has to settle what counts as a prosecution, and establish *subsumption relations* between crime descriptions in multiple jurisdictions – and usually multiple languages.

The RDF concept repository distinguishes the identities of expressions, concepts, and

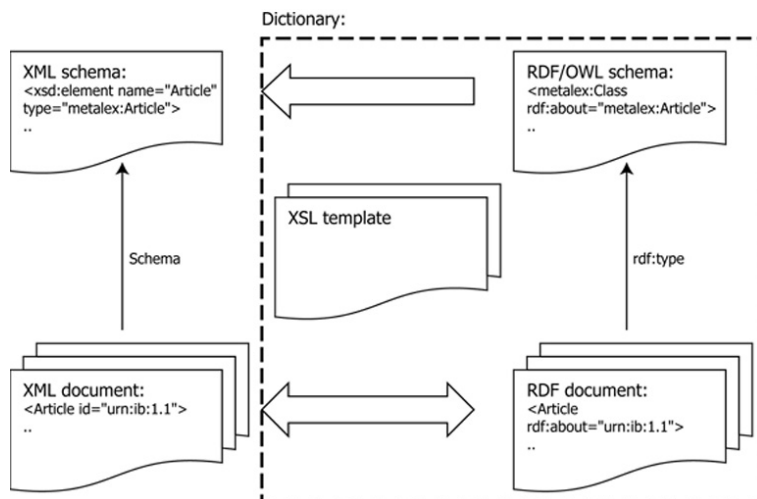


Figure 1: Hierarchical XML and relational RDF representation of Legislation

[*identity, expression, concept*] triples relative to a perspective. In addition to synonyms and homonyms, there are cases the same legal expression defined equivalently in different sources (e.g. ‘wages’ in wage tax and social insurance co-ordination laws in the Netherlands; LB64 art. 10, CSV art. 4): the reason to do this is that, although the definitions are equivalent now, they may diverge in the future⁴.

Our tests with multiple language versions of one contract (French and Dutch) in the E-POWER project shows that a reliable concept-to-concept correspondence between languages is not always achievable [2]: sometimes a word must be translated to one or more sentences. A lexical-concept-centered way of linking multilingual regulations is therefore not sufficient, and a “dictionary-style” browser is insufficient. The English concept of “Theft”, for instance, falls in a different ontological category than its dictionary synonyms “Diefstal” (Dutch) and “Diebstahl” (German) since “theft” is an act of appropriation, and “diefstal” an act of taking (and both jurisdictions do separate these notions). Pragmatically the British and Dutch legal evaluative perspectives on this crime are very similar compared to for instance the “common-sense” evaluative perspective of a libertarian who maintains that taxation is theft. The words are synonyms relative to the many contexts in which they can be interchanged, but synonyms are not equivalent.

We may believe that selected representative case positions will be classified as both “diefstal” and “theft”, but they are not in a logical subsumption relation to each other. The adjudicated case description must be a prime implicant of theft (cf. [14] and generally [10]; i.e. no “substantial” fact can be omitted without changing the judgment) or else principles like *Lex Superior*, *Stare Decisis*, and *Ne Bis in Idem* lose their logical meaning. The modeler and the judge must come to the same decomposition of case positions into “substantial” facts. Looking at the definitions only, it does seem possible to prosecute someone for theft and then for “diefstal”: each requires a substantive fact that the other does not.

For managing subsumption between norms and concepts we use two, complementary solutions: Firstly, the legislative drafter is given the opportunity to add explicit subsumption relations. Secondly, the system can try to find subsumption automatically based on detailed models of descriptive and normative content as we have demonstrated in the CLIME project (cf. [15]). The observations we made in that project about calculating descriptive subsumption and normative exceptions will be integrated into a petri-net based formalism for expressing procedures and norms (cf. generally [11]).

⁴In contracts this is a normal phenomenon: definitions are re-used instead of referred to.

4.3 Evaluation Models

Substantive criteria in regulations for legislative drafting – the ones that cannot be operationalized as restrictions on (XML) form – serve as source material for the decision support functionality. Substantive criteria work as norms of analysis – they serve to choose between alternatives. Norms of analysis are also found in other higher legislation, whether in the same jurisdiction or in the international arena, that the proposed legislation must comply with. Finally there are also important political goals – translated to norms of analysis – to be realized by the proposed legislation. All of these together make up the evaluative perspective of the legislative drafter, that forms the content of an RDF evaluation model about legislation, as described below:

Evaluation Model Some outcome is a reason to choose for or against an alternative from an evaluative perspective. The evaluative perspective is described in the evaluation model, which consists of:

Identity commitments With whose interests does the evaluator identify for the purpose of drafting. This may for instance be the communal interest of the people of the Netherlands, or those of particular vulnerable groups. Different stakeholders have different evaluative perspectives for the same legislation, but the evaluative perspective does not merely represent someone's interests: Presumably the authors serve the communal interests of the Netherlands, and those of academics, because that is part of their identity commitments. At the same time, their evaluation of the communal interests of the Netherlands is not necessarily identical because of differences in assumptions and political outlook.

Norms The metrics that make it possible to identify what alternative serves relevant interests better. These are often relative to the identities committed to: economic growth may be good in general, but the legislative drafter may only be interested in economic growth in the Netherlands – not somewhere else. In other cases they are universal.

Evaluative Concepts The norms of analysis will usually be defined in terms of evaluative concepts; Theft is a typical example – descriptive and prescriptive. The application of the concept is guided by descriptive restrictions and it is an argument against the facts described by it. A label such as “illegal” can be applied to anything, whereas a label like “appropriation” is not an argument against the thing described by it.

Descriptive Concepts Evaluative concepts are defined in terms of descriptive concepts that are understood well enough to recognize their instances.

Causal Assumptions Since evaluative concepts often evaluate situations that cannot be directly controlled, they are often accompanied by certain causal assumptions about how the situations judged undesirable are brought about. Regularities of behavior are the most important class of these assumptions.

Descriptive and evaluative concepts are imported from RDF models that contain fragments of ontology. A comparison between two regulations involved three evaluation models: Two evaluation models that describe the norms expressed in the regulation that serve as *comparatum* and *comparandum*, and a third that serves as *tertium comparationis*. Norms can be considered as a motivator of (my) behavior, or as descriptions of regularities in behavior – a norm that “works” causes a regularity in behavior. Lets take a very simple case. The *tertium*

comparationis expresses $[\neg \textit{smoking}] \prec [\textit{smoking} \wedge \neg \textit{inside}] \prec [\textit{smoking} \wedge \textit{inside}]$, the *comparatum* expresses $[\textit{smoking} \wedge \neg \textit{inside}] \prec [\textit{smoking} \wedge \textit{inside}]$ and the *comparandum* is silent on the issue. The norm in the *comparatum* can be assumed to work as a behavior regularity $\textit{smoking} \Rightarrow \neg \textit{inside}$, in which case the comparatum is better, or not, in which case we are indifferent. Alternatively, there may be a known probability that people will comply with the norm, or there may be categories of people that do, and categories that don't comply. The norms of the comparatum and comparandum become a basis for assumptions about behavior in the *tertium comparationis*.

Because legislation is essentially a tool for evaluating behavior, it is not surprising that it can be represented itself as an evaluation model. In addition to the basic deontic binary distinction *allowed* \prec *disallowed* attached to a situation description, there are explicit evaluative distinctions such as *reasonable* \prec *unreasonable* for behavior, *admissible* \prec *inadmissible* for evidence, and implicit evaluative distinctions such as *status offense* \prec *delinquent act* \prec *crime*, or *verified by evidence* \prec *verified by oath*. Some of the rare cases where the legislator explicitly uses (almost) continuous evaluative scales occur in criminal law (days in prison or amount of fine) and consumption taxes (percentage added) where such taxes are intended to cause evasive behavior.

4.4 Decision Support

Theory construction about law can be treated as an enormously complex system of assumptions about the likelihood of, and preferences for outcomes. Decision support systems (DSS) help us to manage the complicated interactions between our preferences for outcomes and the likelihood that those outcomes come about. Sometimes we choose if we want one thing *or* another, establishing preferences. Sometimes we choose if we want one thing *before* another, establishing priorities. Preference and priority rankings can always be established by comparison of pairs of alternatives. DSS technologies formalizes the problem to be solved in terms of possible choices, likelihood of choices, possible outcomes of choices, likelihood of outcomes of choices, and preference for outcomes.

Legislation expresses norms, and norms express a preference of the legislator, *ceteris paribus*, of case P over Q as long as the legislation exists, given that description P is *ceteris paribus* preferable ([6]) to description Q if all alternative situations p_1, p_2, \dots, p_n are preferable to alternatives q_1, q_2, \dots, q_n and one is otherwise indifferent between those alternatives. This expression of preference is limited to situations that can be caused by a group of people addressed by the legislator and is optionally accompanied by a threat of punishment for disobedience. The punishment is effected by norms that instruct others (police, etc.) to react.

The norms aim to change existing preferences between choices displayed by that group – sometimes by adding a new cost or benefit to a choice. The value of the legislation is primarily based on its results on behavior. The expected desirable effect of legislation on behavior is based on beliefs about people's preferences between alternatives without the legislation, and beliefs about how the new legislation will affect people's preferences (through mechanisms such as mimesis and conditioning). The field of taxation is a shining example of people's ability to adapt their choices in unforeseen and undesirable ways to new legislation.

When multiple, incompatible norms have to be applied to a case, we can choose between the norms, or weigh the relative importance of the norms. The standard criteria for choosing between norms in a norm application context are the authority of the source of the norm (*Lex Superior*) and the cognitively valid rules of belief revision (*Lex Specialis*, *Lex Posterior*).

Since norms, as expressed, are often indicative of underlying preference dimensions that meet criteria such as decomposability, mutual preferential independence, or even mutual util-

ity independence, there is often a standard method (additive value function, multiplicative utility function) for weighing their importance. There are also a number of procedures to reconcile incompatibilities between preferences of different decision-makers (one of the simplest ones being the “anonymous voter” procedure of representative democracy). Using such methods and procedures is usually not acceptable in an application context, but they can, and do, play a role in the context of drafting and evaluation.

A very well-known and standard method assigns utilities and probabilities to outcomes and evaluates alternative choices as alternative “lotteries”. Assigning probabilities gives the whole exercise a sense of exactness that is often undeserved: the real problem is one of coming up with the alternatives and foreseeing the possible outcomes. For this purpose an ontology of the problem domain, like the criminal ontology of our department ([3]), is useful. In the context of law – or almost anywhere outside lotteries – the actual outcome of your choice usually depends on other people’s choices. This can be approached with statistics or, better, with assumptions about the evaluative perspective of others. Legislators typically assume that the norms of analysis of its subjects are largely the same, and the identity commitments are different in that they are selfish. This assumption underlies the simple approaches to game theory that dominate political argument. Civil servants are on the contrary expected to adopt the norms of analysis of legislation, and the identity of the community they serve.

5 Discussion and Conclusions

We have expressed the need for knowledge management support for legislative drafting. Such a support environment should at least provide the following functionalities: Management of references, version management, management of subsumption structures, access to other (similar) legal documents (‘best practices’), and access to guidelines or norms about drafting. Prerequisite for such support is a standard way for describing legal sources. Since legislative drafters are more and more working in an international setting, this standard should be independent of language and jurisdiction. With ^{META}Lex we have proposed such a standard in XML.

Since an important subtask of legislative drafting is the comparison of normative systems, we have explored the usability of ^{META}Lex models of structure and RDF models of content for this purpose. Even in the trivial case of theft a reliable concept-to-concept correspondence is not achievable on purely logical grounds. The feasibility of ‘legal dictionary’ attempts like the ones in the LeXML (cf. [9]) and Legal XML communities is doubtful for more than the most trivial applications. Looking for correspondence at the level of ‘norms’ appears to be more promising.

In a comparison context, civil servants are usually expected to adopt the norms of analysis of legislation, and the identity of the community they serve, unless the comparison concerns civil servant integrity policy. In economic analysis of taxation the rule-following behavior of civil servants is usually abstracted away completely (see e.g. [8, 7]), and the tax administration is described as a machine. Computer-assistance of administrative procedures – expert systems for instance – on the contrary usually coerces the civil servant (internal perspective on obligations), and passively monitors the actions of actors on the outside (external perspective on obligations). This shows that different contexts lead to different assumptions about the norms as motivators of behavior. Often different assumptions in different analyses are reasonable, but it easily leads to confusing intentions with expectations, for example if we assume in one context that a tax on diesel intended to generate income generates income, and in another that a tax on diesel intended to cause evasive behavior causes evasion to another fuel.

An obvious criticism of our focus on codified legislation is that we must assume that the surrounding legal systems are the same for the results to be meaningful. The same can of course be said of the legal theorist who compares legal systems with the intention of a so-called “legal transplant” of interesting (foreign) concepts to another situation: it is another jurisdiction with another culture, another vocabulary, even another role of codified legislation, etc. The freedom of expression granted by the Soviet constitution and the U.S. constitution are for instance clearly not equivalent. In Comparative Law the results are equally restricted by simplifying assumptions.

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