



485

2017

Explaining Difference in the Quantity of Supreme Court Revisions:
A Model for Judicial Uniformity

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EXPLAINING DIFFERENCE IN THE QUANTITY OF SUPREME COURT REVISIONS: A MODEL FOR JUDICIAL UNIFORMITY

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November, 2016

Abstract

While civil law supreme courts (e.g., Italy, France, Chile) hear up to 90% of the petitions for revisions, common law supreme courts (e.g., U.S., U.K, Canada) hear as low as 1% of the same type of cases. In this study we postulate that these different commitments towards revisions are each consistent with different approaches by which the legal system provides judicial uniformity. We formulate a theoretical model that shows that a given level of uniformity in lower (or appeal) court decisions can be achieved either by fixing a given probability of judicial revision or a given monetary/non-monetary disutility associated with a reversal. Hence, despite the fact that common law legal systems are characterized by a lower probability of case revision, we cannot state *a priori* that judicial uniformity is greater in civil law systems, as this will depend upon the magnitude of the disutility associated with a reversed decision. Indeed, with the exception of the impact upon career concerns (which net effect is not clear) in terms of ideology, reputation and legal standards, reversal disutility seems to be much higher in common law systems than in civil law systems. In addition, we demonstrate that in an efficient legal system the optimal number of revisions increases with the size of the reversal disutility, but decreases with the probability that the supreme court makes erroneous decisions; the total number of cases soliciting revision and the intrinsic utility obtained by a lower court which enforces its desired rule. We also show that in an efficient legal system it is the judicial law-making role of a common law supreme court that explains why that Court revises fewer cases than a civil law supreme court.

JEL: K10, K40, K41

Key Words: Supreme court caseload — Common law vs civil law — Legal uniformity

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1. INTRODUCTION

The rule of law commands that every citizen must be judged under the same interpretation of law across all the courts within the judicial system. The ‘equality before the law’ clause requires uniformity in the criteria of judicial decision-making (BINGHAM, 2011) which on one hand requires a general decision-making criteria that can be determinate and predictable (TAMANAHA, 2004, p. 90) and on the other, depends upon a device to monitor and reduce deviations by judges from that defined decision criteria. In other words, all legal systems committed to judicial uniformity aim to minimize the variance of judicial adjudication (UZELAC & VAN RHEE, 2014, p. 3).

Conventionally, appeals are mechanisms that assure judicial uniformity through monitoring (and if necessary reversals) of lower judges’ decisions (SHAPIRO, 1980, p. 629; SHAVELL, 1995; cfr. OLDFATHER, 2010). At a national level, such appeals may end in ‘last resort’ tribunals, which, for the purposes of the current study we will call the “supreme court” (YIANNOPOULOS, 1998, p. 67-68).² From a comparative perspective, however, supreme courts exhibit a “bewildering variety” not only in their denomination but also in their characteristics (JOLOWICZ, 1998, p. 38).

This bewildering variety becomes particularly evident in the number of cases that common law and civil law supreme courts review annually (JOLOWICZ, 1999, p. 5). In principle, a court with a higher number of cases under review may be more capable of monitoring lower courts

² This is the denomination in the US and the UK. However, such national court of last resort has different names in other jurisdictions. For example, Court of Cassation (*Cour de cassation*) in France and Italy, or Federal Court of Justice (*Bundesgerichtshof*) in Germany.

decisions. Apparently for historical reasons,³ however, the supreme courts of each legal tradition adopted almost oppositional case revision strategies. While for the civil law approach, particularly in jurisdictions following the French example, the procedural regulation ensures each litigant a high probability of a supreme court revision (GARLIC, 1920, p. 8),⁴ for a common law approach, the access to this last resource tends to be tightly restricted due to the presence of “filters”, such as a requirement for permission to appeal or a discretionary certiorari (GOLDSTEIN, 1998, p. 290; CORDRAY & CORDRAY, 2004).

Civil law supreme courts, following the so called “cassation” model, hear a larger number of cases annually (TARUFFO, 1998, p. 109) than common law supreme courts (BRAVO-HURTADO 2014, p. 325). For example, in 2002 the Italian *Corte di Cassazione* received approximately 25,000 appealed petitions of which 20,000 were decided by the Court (TROCKER & VARANO, 2005, p. 264) and the French *Cour de Cassation* decided 20,613 cases of 22,700 petitions presented to it (FERRAND, 2005, p. 14). On the other hand, common law supreme courts hear fewer appealed petitions (JOLOWICZ, 1999, p. 5). In a single year the former British *House of Lords* heard only 68 of the 269 requests. The Canadian *Supreme Court* decided 96 of 658 applications (LE SUEUR, 2004, p. 271). Finally, in the U.S. *Supreme Court* 8,023 cases were presented, of which only 88 were decided (WHEELER, 2004, p. 248).

It is equally noteworthy that, despite these oppositional case revision policies, legal actors from both legal traditions appear to agree on the priority of the supreme courts contribution to

³ More specifically, the role played by the judicature during the Revolution Era of the XVII-XVIII centuries (see Dawson, 1968], 375-386; Cappelletti, 1971], 13; Merryman & Pérez-Perdomo, 2009).

⁴ The situation is different in countries following the German example. In those other countries, even if they belong to the civil law tradition, some preliminary selection policy based upon a criteria of case importance have been introduced in the twenty-first century (Domej, 2014).

the unity of the interpretation of the law (CALAMANDREI, 1920, p. 77; O'CONNOR, 1984, p. 5; WEBER, 2010b, p. 2; MUÑOZ, 2010, p. 91). Both civil law and common law understand that one primary role of the judges at the top of the judicial hierarchy is to provide society with judicial uniformity. This apparent contradiction leads us to formulate a series of interrelated questions.

In order to ensure a certain level of judicial uniformity, should the supreme court hear a large number of cases (civil law) or a small portion of them (common law)? Under what conditions can supreme courts with almost opposite revision numbers be equally effective in keeping the lower courts decisions uniform? In other words, can such different case revision policies represent alternative ways of achieving equivalent levels of judicial uniformity?

In order to answer the previous questions, here we propose a formal two-tier model comprised of a continuum of lower courts and a single supreme court. The model allows us to measure the uniformity of lower courts' decisions as the ratio of courts that enforce the legal rule over the total number of courts. Lower courts may enforce their own preferred rule (or their particular interpretation of it), instead of the legal rule (or the uniform interpretation of that rule, as settled by the central supreme court). However, in such case that the lower court applies its particular rule rather than the uniform one, their decision can be challenged, revised and reversed by the supreme court with a given exogenous probability. In the case of a reversal, the corresponding lower court (judge) faces some disutility, which is not necessarily monetary. This disutility can either be ideological (a reversal frustrates the implementation of the judge's political agenda); reputational (a reversal challenges the social status of the judge), or detrimental to career promotion (more reversals may diminish the prospect of being appointed in a higher position).

As main result we show that the same level of uniformity in lower court decisions can be achieved either by setting an optimal reversal disutility⁵ or an optimal probability of revision. These two factors define an expected revision disutility that incentivize the lower court to implement the uniform legal rule, as interpreted by the supreme court. In particular, we notice that because in the case of a revision and reversal, the uniform legal rule and not the lower court preference is finally implemented, the probability of revision has an augmented impact upon lower court incentives (the impact is not restricted to a value between 0 and 1 but to a value between 0 and infinity).

The previous result regarding two ways of achieving uniformity has three direct implications. First, if two legal systems have similar levels of reversal disutility, then the one that demonstrates a higher ratio of revisions will provide a higher judicial uniformity. Second, if two legal systems have a similar ratio of revisions, then the one with a higher reversal disutility will provide a higher judicial uniformity. And third, if two systems have opposite levels of reversal disutility (high and low), then both will provide the same level of judicial uniformity as long as they revise a similarly disparate ratio of petitions (low and high). In other words, given the same level of judicial uniformity, there is an inverse relation between ratio of revisions and reversal disutility.

Given the aforementioned caseload data, it is tempting to conclude that civil law is more efficient than common law at providing judicial uniformity. But our results suggest that any conclusion in that line will centrally depend upon the levels of reversal disutility faced by lower

⁵ As we will mention in other parts of the paper, this utility can be set for example by increasing or reducing judges' visibility, increasing judges' salary differences between hierarchical levels, and by institutionalizing case reversals as a relevant factor at the moment of deciding promotions.

courts in the civil and common law systems. It is a theoretical possibility that the common law reversal disutility is sufficiently large to compensate for its comparatively low rate of revisions.

In which legal system, common law or civil law, do judges face a larger reversal disutility? The literature (which we discuss in Section 2) overwhelmingly suggests that the answer is the common law system if we exclude considerations of the “promotion concern”. As it has been argued the ideological and reputational disutility from a reversal is clearly greater in the common law than in the civil law. In addition, the non-monetary “benefits” of pursuing a career promotion — the higher ideological and reputational utilities of been sited at a higher court — appear to be much higher for the common law than for the civil law as well. Finally, each reversal in the common law setting calls the lower judge’s abilities into question in a more severe way than in the civil law setting because the standard of review of the common law appeal is much stricter.⁶

Given the inversely proportional relationship between reversal disutility and the probability of revision found in our model it follows that, if indeed reversal disutility is much larger under common law than under civil law, for common law and civil law to provide a similar level of judicial uniformity the probability of revision in common law must be lower (or much lower) than the probability of revision in civil law. Even if one believes that the implementation of common law is less uniform than the implementation of civil law, our model suggests that the difference between these two systems is much smaller than what the pure difference in the rate of revisions suggest.

⁶ Despite the previous considerations, we cannot categorically state that reversal disutility is greater in a common law legal system than in a civil law system. This is because evidence suggests that civil law judges give particular relevance to the ways that reversals will affect their ability to climb the judiciary hierarchy than their common law peers. As we argue in Section 2, the salary differences between lower and higher judges do not seem to favor one legal system over the other. The comparison largely depends upon the two specific jurisdictions being compared.

In order to arrive to a more nuanced version of our model, we consider that the supreme court can err by not correctly reversing lower court decisions. We also take into consideration the high cost to society of revisions and therefore the fact that the probability of a case revision indeed corresponds to the ratio of revisions over petitions. Within this framework we find that the optimal (from a social point of view) number of revisions is an increasing function of the size of the reversal disutility.

This last finding seems counterintuitive because, *ceteris paribus*, a high reversal disutility (common law) would induce a supreme court —that aims to maximize judicial uniformity— to revise more cases than a low reversal disutility (civil law), exactly the opposite of what happens in reality. However, we quickly notice that it is inaccurate to consider that all the key parameters of the model will be the same for a common law and a civil law system. In particular, the cost of each revision should be much higher in the former than in the later. In common law the cost of a revision not only includes fixed costs such as buildings, property and equipment or variable costs needed to keep the system operational (these same costs apply in civil law). Yet, because the doctrine of *stare decisis* is unparalleled in the civil law, in the common law the Supreme Court's role is as generator and shaper of legal precedents. Therefore, each common law supreme court revision implies a large opportunity cost due to the impact of all the precedents not settled because of the cases not revised.

We demonstrate that in an efficient legal system, the optimal number of revisions is centrally determined by the ratio of reversal disutility over “revision costs”.⁷ The larger this ratio is, the larger the optimal number of revisions will be. It follows that even when the reversal disutility may

⁷ More specifically by the ratio of reversal disutility over the square of the revision cost.

be higher in common law than in civil law, if the cost of revision is also higher in common law than in civil law then the optimal ratio of revisions will be much lower in common law than in civil law, as it happens in reality.

Previous literature on differences on supreme courts number of revisions or judicial uniformity has focused almost exclusively on common law. Much of this scholarship aims to predict supreme court decisions (SEGAL & SPAETH, 1993, p. 2002; CLAYTON & GILLMAN, 1999), and describes relationships among courts in the context of the principal-agent model (COSGEL & MICELIL, 1993; SONGER *et al*, 1994; GEORGE & YOON, 2003; HAIRE *et al*, 2003; FISCHMAN, 2006). Literature that applies these models and ideas to civil law countries is scarce (FON & PARISI, 2006; PARISI & LUPPI, 2010). But efforts to formally compare, from an economy perspective, civil law and common law in terms of number of revisions or judicial uniformity is practically non-existent. Hence, this paper seeks to contribute with a comparative study regarding the supreme courts within the two legal traditions.⁸

The rest of the paper is organized as follows. In Section 2 we provide a depth discussion of why we believe disutility associated with reversals could be higher in common law than in civil law systems. In Section 3 we present our base model. In Section 4 we present our main result. In Section 5 we derive farther results after we extend the base model. In Section 6 we conclude.

⁸ It is worth noting the importance of a paper like this for a country such as Chile. In 2004 Chile committed to modernize its civil justice system (Núñez, 2005, 2008). One objective of this reform was to move the Chilean Supreme Court closer to a court of precedents -a court similar to the common law Writ of *Certiorari* with its discretionary selection of a small proportion of cases- than to a traditional court of civil law (De La Fuente, 2011). This implicit abandonment of the “Casación en el Fondo” –broadly accessible for litigants to the final recourse– has drawn criticism among Chilean experts and practitioners. Restricting the number of cases that reach the Supreme Court, they say, does not allow effective control of the decision criteria of the lower courts, and equality before the law might no longer be protected (Delgado, 2009, 2011). This criticism seems particularly valid after we consider that in Chile, sanctions for reversals have not changed and therefore we should expect a reduction in judicial uniformity.

2. COMPARING REVERSAL DISUTILITY

Civil law and common law are different in many dimensions (GLENN, 2006; GLENDON, CAROZZA & PICKER, 2008; HEAD, 2011; LUNDMARK, 2012), and the supreme courts, as key pieces of judicial systems, represent one of these differences. For example, precedents in common law jurisdictions have a strong binding force that is considerably lower in civil law nations (MACCORMICK & SUMMERS, 1998, p. 538). While common law jurisdictions include a right to a jury in their constitutions, juries are practically absent in civil law countries. The civil law lawyers prefer a strict codified legislation, while their common law counterparts seem to give less relevance to these codes (MERRYMAN & PÉREZ-PERDOMO, 2009). While in common law the legal process is usually classified as adversarial in civil law the process is classified as inquisitorial (COOTER & ULEN, 2011; cfr. JOLOWICZ, 2003). Even culturally we find differences; common law judges enjoy a high social prestige and visibility (ZWEIGERT & KÖTZ, 1998, p. 210), while civil law judges are anonymous bureaucratic employees of the judicial system (COTTERRELL, 1992, p. 231).

Central to our study, the literature has noticed the existence of a “fear of reversal” (POSNER, 1993, p. 14; CAMINKER, 1994, p. 77) which incentivizes both common and civil law judges to avoid reversals of their decisions (DRAHOZAL, 1998, p. 477). The question is to what extent civil law and common law judges exhibit similar or different levels of fear to reversal.⁹ As we will explain next, the literature clearly favors that reversal disutility in terms of ideological and reputational losses as well as issues related to standard of reversal is larger under common law

⁹ There are some empirical studies testing the fear of reversal. For the US, RANDOZZO 2008 [based on a sample of cases between 1925 and 1996, found that district courts constrain their decisions based on an anticipation of the court of appeal response]; cfr. KLEIN & HUME’s 2003. For the civil law, SCHNEIDER 2005 [German labor appellate courts]; and PÉREZ-LIÑAN, AMES & SELIGSON 2006 [Bolivian lower courts].

than under civil law. Instead, the literature suggests (although not conclusively) that reversal disutility associated with career concerns is larger in civil law than in common law. Hence, we conclude that, if we leave aside career concerns, reversal disutility is larger (and maybe much larger) in common law than in civil law legal systems.

2.1. Ideological disutility

First, given that common law judges are committed to the vindication of precedents, their interests in imposing their doctrinal, ideological or legal preferences in the legal community are considerable. In that line there is substantial common law literature that stresses the utility obtained by judges at making decisions (e.g. MCNOLLGAST, 1995, p. SHAPIRO & LEVY, 1995) on ideological (POSNER, 1993; SEGAL & SPAETH, 2002), rational (DRAHOZAL, 1998) and discretionary terms (COHEN, 1991). Obviously, the utility of the common law lower court which derives from the implementation of his or her doctrinal preferences through their precedents will be lost if a higher court revokes their judgments. In sum, the reversal frustrates the lower court's ideological agenda.

Civil law judges, on the other hand, are not committed to the vindication of precedents at the same level as in common law. Although it could be argued that doctrinal, ideological or interpretation disputes about the law are also present among certain civil law judges (LASSER, 2004, p. 38-39), much less frequently these disputes are expected to be resolved not through judicial decisions but by the Congress. This point directly derives from the traditional conception within the civil law legal culture that, unlike the common law, judges do not make general rulings because they should be the mere "mouth of the law" (MONTESQUIEU, 1748) that applies enacted legislation, mainly the codes. In the absence of a strong *stare decisis* doctrine, civil law judges derive less utility from imposing their own ideological view in the current case because their

judgments have considerably lower impact upon the future decision criteria. Accordingly, a reversal in the civil law does not reduce the judge's ideological utility to the same extent as in the common law because in the civil law there is, *a priori*, no high ideological utility at stake.

2.2. Reputation disutility

Second, it is a fact that common law judgments, particularly those from the highest courts, receive considerable public attention. The Supreme Court judgments are widely known by law students, law professors, judges, lawyers, politicians and even the public media (HOEKSTRA, 2003; COLLINS & COOPER, 2012). Also, the judgments in a typical common law court are individually signed by each judge (MUNDAY, 2002, p. 321). Therefore, the merits (or demerits) of each decision can be individually attributed to a specific judge. The combination of these two factors, public and signed judgments, can explain the high reputational disutility that a common law judge may derive from a reversal. Common law judges are considered to be public figures (GARAPON & PAPADOPOULOS, 2003, p. 157-158) and, thus, an important stake of that social status is at risk with a reversal. In Caminker's words, judges dislike reversals because "their professional, audience, including colleagues, practitioners, and scholars, will disrespect their legal judgments or abilities" (1994, p. 77). In sum, reversals challenge their social status.¹⁰

The judgements of a civil law court, instead, are subject to a lower level of publicity than common law courts. Only a modest number of the French Court of Cassation decisions, for example, are published in reports each year (WEBER, 2010, p. 105-106). Additionally, unlike the

¹⁰ CHOI, GULATI & POSNER's (2011) sheds more light on this aspect. Based on a data set of 2001-2002, they demonstrated that federal district judges adjust their practices of opinion-writing not only to minimize their workload, but also to maximize promotion and also reputation utility.

common law, the judgments of a court panel are not individually signed by each judge. Instead, judgments in civil law courts are dictated at the name the tribunal as a whole (GINSBURG, 2010, p. 2). Thus, the responsibility for the decision is equally and indistinguishably shared by all the members of the panel. In case of a reversal, accordingly, it is not possible to attribute the mistake to any particular judge but to the panel as a whole. This sort of “anonymous” collegial judgments, combined with the low level of publicity of the courts decisions, certainly diminish the impact of any reputational disutility that a civil law judge individually considered may derive from a reversal. Furthermore, civil law judges are not considered public figures with a high social prestige as are their common law colleagues (GARAPON & PAPADOPOULOS, 2003, p. 158-159). Therefore, for a civil law judge there is a lower stake of social status at risk with each reversal because they do not enjoy such high social status in the first place.

2.3. Promotion disutility

Besides of this ideological and reputational utility, reversals can be relevant for the career of judges. Judges may fear a high rate of reversals because it could be detrimental to their promotion (CAMINKER, 1994, p. 77). But in order to understand this point, we need to compare the relevance of judicial promotion in each legal tradition, on the one hand, and whether the rate of reversals affects judges’ chances of promotion, on the other.

2.3.1. Monetary benefit

Career promotion is certainly of concern for both judges in the civil law (MERRYMAN & PÉREZ-PERDOMO, 2007, p. 35) and the common law jurisdictions (POSNER, 1995; SHAVELL, 1995). Regarding the monetary incentives, salaries are the main source of comparison. Salaries of the

higher court judges tend to be higher than the ones of the lower courts and ergo provide a monetary incentive to climb in the system. However, evidence tends to be mixed when we compare differentials between high and low court salaries in common and civil law systems. In the U.K.-Scotland Supreme Court judges earn 133% more than a first district judge (MINISTRY OF JUSTICE, 2015), while in Spain that ratio is 100% (ELCONFIDENCIAL.COM, 2016). But in the US, the Chief Justice makes only 28.4% more than a district federal judge (USCOURTS.GOV, 2016). Therefore, if we compare the examples of Spain and the US, we should conclude that a civil law jurisdiction could have much higher monetary incentives to pursue career promotion than a common law jurisdiction.

2.3.2. Non-Monetary benefit

However, the monetary reward (salary) is not the only utility which judges enjoy from their positions, and may not be the most important one given other more profitable professional options (POSNER, 2008, p. 162-168). As discussed in the previous sections, ideological and reputational utilities should not be underestimated.

In the common law, courts have a stronger precedential force and visibility in general (see subsections 2.1 and 2.2) and the supreme court enjoys the highest power and visibility of all. In comparison the civil law courts generally have weaker precedential power and lower visibility. The civil law supreme courts also have a stronger force and visibility than civil law lower courts. But the power and visibility of a common law supreme courts will be much higher than a civil law supreme court. Therefore, a judge mostly driven by these non-pecuniary incentives, such as the ideological and reputational utilities, will find more reward in ascending to the supreme court in the common law than in the civil law.

2.3.3. *Probability of promotion*

The relevance of a reversal for the probability of promotion for a judge seems to be larger in civil law than in common law. To illustrate this we focus on the promotion of a judge from the court of appeals to the supreme court, particularly in the number of vacancies. The US Supreme Court, for example, has only nine members (GREENHOUSE, 2015, p. 25). From the perspective of the court of appeal's judges, their possibilities of promotion are limited because the next echelon in their hierarchy is extremely small. Accordingly, some US legal authors tend to emphasize that these restricted possibilities of ascending in the hierarchy, due to the reduced size of the Supreme Court itself, limit the appeal court judges concerns regarding promotion (POSNER, 2008, p. 37). In contrast, in the civil law the supreme court may have hundreds of judges. For example, there are 200 in France (CADIET, 2011, p. 186-187) and approximately 500 in Italy (SILVESTRI, 2016). The French and Italian supreme courts have a large number of judges and because of that, probably the rate of rotation among them is faster than in a common law supreme court. Therefore, the probability of promotion for a civil law appellate judge to their supreme court is likely much higher than in the common law. As a consequence, the concern for promotion could be more prominent in civil law judges.¹¹

The starting age of a judge's career can also affect their interest in promotion. In the civil law, judges hold a lifetime bureaucratic career. This means that civil law judges start their career at a younger age than in the common law, right after law school (GLENDON, CAROZZA & PICKER, 2008, p. 86). It is unlikely that these young judges will be willing to remain in low ranks of the

¹¹ This is consistent with the theory of labor tournaments applied to the judicial career (e.g., SCHNEIDER, 2004).

judiciary for long time periods. Accordingly, they will strive to be appointed to better positions as they gain experience (POSNER, 2008, p. 128-129).

In the common law, the judiciary career does not have the life-long bureaucratic feature found in the civil law. In the common law, instead, first instance judges are usually appointed after a successful career during decades as practicing lawyers (GLENDON, CAROZZA & PICKER, 2008, p. 236-237). As a result, common law judges are appointed in their first positions at a much older age than in the civil law, in their late forties or fifties (POSNER, 2008, p. 128-129). Therefore, in the common law judge “lifespan” is much reduced. For a common law legal professional, the judicial career is a shorter final occupation of their work lifetime. With less years in the judicial career, common law judges have fewer opportunities to escalate in their positions.¹²

Judges’ access to the higher ranks of the judiciary is also central to determine the incentives faced by judges considering promotion. Civil law tends to be a “closed” bureaucratic career. This means that candidates who are external to the judicial bureaucracy are unlikely to be appointed directly at the higher ranks. In the civil law, the higher positions are reserved mainly for internal candidates (GLENDON, CAROZZA & PICKER, 2008, p. 86). Instead in the common law, the entry channels are more accessible to external candidates from different branches of the legal profession. In the civil law such “lateral entry” is rare in comparison with the common law (MERRYMAN & PÉREZ-PERDOMO, 2007, p. 35, 103).

These different entry channels are relevant in the comparison of promotion opportunities. In a closed system, such as the civil law, a candidate for promotion will be evaluated only on her

¹² Following the idea of tournaments in the judiciary, thus, the tournament is not only more difficult but also shorter in the common law than in the civil law.

previous professional performance as judge (BELL, 2010, p. 368): seniority in the position, productivity statistics and rate reversals, among other factors. While in an open system, such in the common law, the external candidate prospects may depend on her non-judicial performance or on the situation of a practicing lawyer. Hence, in this case, the rate of judgment reversal does not apply to her evaluation.

The previous three reasons — number of vacancies, starting age and channels of entry — signal that the relevance of the rate of reversal for the promotion probabilities should be lower in the common law than in the civil law.

2.4. Standard of review

Common law and civil law are also different in the procedural regulation of their appeals, particularly in their standards of review. The standard of review defines the degree of seriousness of the mistakes committed by the lower court that justify a higher court reversal. If the standard is high, then only the most severe and evident mistakes will be reversed.

In the common law, the standard of review tends to be higher than in the civil law. In the US Federal Court of Appeals, for example, the questions of fact or procedure can be reversed only if the lower judge incurred a “clear error” or “abuse of discretion”, respectively (CASTANIAS & KLONOFF, 2008, p. 182-193). A high standard of reversal as such should imply that fewer cases will be reversed. Under a high standard, the common law court of appeal will exercise its reversal power only in the case of serious errors.

A high standard of review also implies a major reprimand (disutility) to the common law lower judge that actually infringes the standard. Because the standard of review is higher, if an

error is actually reversed in the common law appeal, the reversal involves the public recognition that the lower judge incurred an extremely serious mistake (a “clear” error or an “abuse” of power).

In the civil law, to the contrary, the standard of review is lower. The consequence is that the appellate court is not limited to review only the most serious and evident mistakes. The civil law appeal has no deference to the lower court (COFFIN, 1994, p. 20) and, thus, it can reverse a judgment merely because of disagreement with the lower court. But unlike the common law, a low standard does not invoke a major reprimand to the lower court in case of a reversal. Under such low standard of review, the civil law court of appeal can reverse the first instance judgment just because of a (relatively minor) disagreement. Therefore, a reversal in the civil law does not necessarily signal that the lower court committed a serious mistake.

In sum, this comparative analysis seems to indicate that, excluding career promotion concerns, the reversal disutility suffered by judges should be higher in common law than in civil law. In the next section we develop a model that takes into account this reversal disutility difference and identifies optimal rates of supreme court revisions both in common and civil law.

3. THE MODEL

There exists a continuum of first-tier courts parameterized in the interval $[0,1]$. Court i has utility function $u(x, r_i)$ which is concave in both arguments and satisfies $u_x(r_i, r_i) = u_{r_i}(x, x) = 0$ together with $u(r_i, r_i) = u(r_j, r_j)$ for all $r_i \neq r_j$. Given a certain case, $x \in [0,1]$ represents the legal rule enforced by the court i and r_i is the legal rule it would ideally like to enforce (court i optimal rule). We assume that r_i is uniformly distributed in the interval $[0,1]$. To understand this characterization more intuitively, suppose that a company is disputing the items that should be

included in the calculation of the salary of a worker who is claiming wrongful termination of his contract.¹³ Suppose that the possible items are a fixed salary x_F ; a variable salary x_V and additional issues such as money for transportation and food x_A . According to both Chilean labor law and recent Supreme Court decisions the salary (which indeed is the average of the three last payments) includes fixed and variable payments but does not include the additional issues¹⁴, that is $r_L = (x_F + x_V)/(x_F + x_V + x_A)$. Hence a law abiding first-tier court should enforce $x = r_L$. However in the spectrum of the judiciary, there is an equal number of courts that would like to enforce any compensation, from $r_i = x_F/(x_F + x_V + x_A)$ to $r_i = 1$ instead of $r_i = r_L$.¹⁵ To simplify, we assume that $x_F \geq 0$ hence $r_i \in [0,1]$.

Consider that at time $t = 1$, all the first-tier courts face a case of the same characteristics. If the court enforces the existing legal rule r_L then the dispute ends there, there is no appeal, and court i obtains utility $u(r_L, r_i)$. Instead if court i decides to enforce rule r_i (in this basic formulation court i prefers rule r_i to any other rule) then at time $t = 2$ its decision could be appealed to the supreme court with exogenously given probability p .¹⁶ In the case of an appeal the supreme court overrules the first-tier r_i decision and replaces it with rule r_L .¹⁷ In addition, in the case of an appeal the first-tier court suffers a disutility/cost D with certainty, disutility whose meaning was explained in Section 2. We consider that there is no discount factor.

¹³ The salary is a key variable in order to calculate indemnities.

¹⁴ In MJCH_MJJ21563Rol:5675-09, the fourth room of the Supreme Court established that additional issues such as money for transportation and food should not be included in the calculation of salary as the base for calculation of compensations because they are not permanent but temporary compensations. Even more, the unification sentence MJCH_MJJ23558Rol:9603-09 from April of 2010 reaffirmed the previous sentence in that matter.

¹⁵ The uniform distribution does not seem realistic in this example but we keep it for simplicity in the exposition of our ideas. Later in the paper we discuss the sensitivity of the results to changes in the distribution of r_i .

¹⁶ We are assuming a two-tier Court hierarchical system.

¹⁷ Later we consider the case in which appeals do not always mean overruling. The strength of these results are moderated but still hold.

Under these conditions, court i expected utility when it decides r_i is given by

$$(1 - p)u(r_i, r_i) + p(u(r_L, r_i) - D)$$

It follows that court i enforces the legal rule r_L if and only if

$$\frac{p}{1-p}D > u(r_i, r_i) - u(r_L, r_i) \quad (1)$$

Due to the concavity properties of the utility function we know that (1) defines cut-off rules \underline{r} and \bar{r} such that (1) is satisfied by all $r_i \in [\underline{r}, \bar{r}]$ but it is not satisfied otherwise (see the proof of Lemma 1). The exact expressions for the cut-offs are defined by:

$$\frac{p}{1-p}D = u(\bar{r}, \bar{r}) - u(r_L, \bar{r}) = u(\underline{r}, \underline{r}) - u(r_L, \underline{r})$$

Furthermore, while \underline{r} is decreasing in p and D , \bar{r} is increasing in the same parameters. These results are summarized in the next Lemma.

Lemma 1: Judicial Uniformity

- i) Only courts with optimal rule $r_i \in [\underline{r}, \bar{r}]$ enforce the legal rule r_L .
- ii) The set of courts that enforce the legal rule increases with parameters p and D .

Proof: See the Appendix.

As we are mainly concerned with uniformity we say that a legal system is more uniform the closer parameter α is to 1. In which:

$$\alpha = \bar{r} - \underline{r} \in [0,1]$$

Evidently α is a measure of the proportion of courts that enforces r_L .

4. MAIN RESULT

Intuition suggests that judicial uniformity should be higher under a civil law system than under a common law system. The logic is that while in civil law countries the supreme court hears close to 90% of the disputes that request revision, in common law countries that number is less than 5%. This suggests that in countries with the first type of legal systems, first-tier courts have more incentives to abide by the law than their counterparts in countries with the second type of legal system. However, the simple model developed in the previous section reveals that the probability of revision is insufficient to conclude whether a legal system induces larger uniformity in the decision of its courts.

What (1) reveals is that both the probability of revision of the first-tier decision and the size of the reversal disutility D matter at the moment of determining the degree of uniformity. Although the value of parameter p tends to be higher in countries that belong to the civil law legal tradition, if the value of parameter D in these countries is much smaller than the same in countries that belong to the common law legal tradition the conclusion could be that judicial uniformity is higher in the later than in the former.

We can formally state the previous intuition by noticing that for any level of uniformity α there *always* exist parameters p^* and D^* such that for all $p > p^*$ or for all $D > D^*$ that legal system achieves legal uniformity of at least α . Notice that the result is not equivalent to consider the role played by the expected disutility, which is pD , because in the case of a reversal the enforced rule is r_L . The fact that $u(r_i, r_i) - u(r_L, r_i)$ must be larger than $pD/(1 - p)$ and not pD implies that the probability of revision can reduce or amplify the impact of D without restriction (in other words $p/(1 - p) \in [0, \infty]$ and not $[0, 1]$).

In order to exactly identify p^* and D^* notice that by definition of \underline{r} and \bar{r} we have that

$$u(r_L, \bar{r}) = u(r_L, \underline{r}) = u(r, r) - \frac{p}{1-p}D$$

Then because of its properties we can rewrite $u(r_L, \bar{r})$ as $u(r_L, \bar{r}) = h((r_L - \bar{r})^2) : \mathfrak{R}^2 \rightarrow \mathfrak{R}$ such that

$$\bar{r} = r_L - h^{-1}\left(h(0) - \frac{p}{1-p}D\right)$$

$$\underline{r} = r_L - h^{-1}\left(h(0) - \frac{p}{1-p}D\right)$$

It follows that¹⁸

$$\bar{r} - \underline{r} = \alpha = 2h^{-1}\left(h(0) - \frac{p}{1-p}D\right)$$

which allows us to identify p^* and D^* as summarized in the next Proposition.

Proposition 1: *If we express $u(r_L, \bar{r}) = h((r_L - \bar{r})^2) : \mathfrak{R}^2 \rightarrow \mathfrak{R}$ then a level of judicial uniformity α can always be achieved in two ways:*

- i) *Setting probability of revision $p^* = (h(0) - h(\alpha/2))/(h(0) - h(\alpha/2) + D)$*
- ii) *Setting disutility $D^* = (h(0) - h(\alpha/2))(p/(1-p))$*

Proof: See the previous analysis.

REMARK A parallel can be made between our analysis and BECKER'S (1968) famous conclusion that the number of criminal offenses can be achieved either by an increment in the probability of conviction (sentence revisions in our model) per offense or by an increment in the punishment (disutility associated to a reversal in our model) per offense. These two mechanisms operate as

¹⁸ Notice that $h(0) = u(r, r)$.

substitutes.

An Example: To appreciate our results more clearly here we consider the case $u(r_L, r_i) = a(1 - (r_L - r_i)^2)$ in which a is a constant that measures utility when the court enforces its first best rule. Then $\bar{r} = r_L + \sqrt{pD/a(1-p)}$ and $\underline{r} = r_L - \sqrt{pD/a(1-p)}$ which implies that $\alpha = 2\sqrt{pD/a(1-p)}$. Hence

$$p^* = \frac{a\alpha^2/4}{D+a\alpha^2/4} \text{ and } S^* = \frac{a(1-p)}{p}\alpha^2/4$$

Intuitively, the larger is the probability of revision or the reversal disutility, the less demanding is the threshold for the other key component to achieve the desired level of uniformity. Also as expected, the thresholds are increasing in α and decreasing in a . Note that p^* cannot be larger than $\alpha = (a/4)/(D + a/4)$ which implies that if the court does not care about enforcing the correct rule (parameter a is small) then a certain level of uniformity can be achieved with a very small probability of revision.

5. DISCUSSION

A rational supreme court — that is to say, a court aiming to maximize judicial uniformity — should be able to set the probability of revision by selecting the number of cases it wants to review. Its main objective is to maximize judicial uniformity while considering that a revision is costly for society. The cost of a revision not only includes direct fixed and variable costs such as judicial buildings and salaries, but also includes the reality that common law justices face a significant opportunity cost and externalities when revising cases because of the impact in future cases due to the binding force of the precedents that is settled in the current case review.

In this section we not only identify the optimal number of revisions when we consider that supreme courts can make mistakes (subsection 5.1) or lower court preferences might not be uniformly distributed (subsection 5.3) but we also determine the sensitivity of results with respect to the size of a reversal disutility. We find that the optimal number of revisions increases with the size of the reversal disutility, which might appear contradictory to the fact that common law supreme courts tend to revise fewer cases than civil law supreme courts. However, after because of the judicial law-making role of a common law supreme court, the cost of a revision should be considerably higher in common law than in civil law, hence it follows that the optimal rate of revisions in common law can be considerably lower than the optimal rate of revisions in civil law (subsection 5.2). We end by simulating the model in the cases of Chile and the United States from where we show that the ratio of reversal disutility over the cost of a revision is paramount predicting the optimal number of revisions (subsection 5.4).

5.1. Supreme court's errors and optimal number of case revision

Legal scholars usually agree that the greater the number of cases revised by the supreme court, the less reliable its decisions seem to be (e.g., CORDRAY & CORDRAY, 2004; TARUFFO, 1991, p. 172; TROCKER & VARANO, 2005, p. 264; cfr. NIEVA, 2010, p. 50). More specifically, every certain time we should expect to find errors made by the supreme court in the form of failures to revert first-tier decisions that do not follow the prevalent legal rule. That is true both for common and civil law legal systems. In addition, we can directly assume that a probability of revision relates to the ratio of cases that the supreme court decides to hear. Keeping these two considerations in mind, here we ask: What is the optimal number of cases that the supreme court should revise?

In the context of our model we assume that $u(r_L, r_i) = a(1 - (r_L - r_i)^2)$ and we consider that $p = n/N$ in which n is the number of cases heard by the supreme court and N is the total number of cases that are requesting revision. In addition, we consider that in case of appeal, the supreme court correctly reverts the low-tier decision only with probability $p(1 - e)$ in which $e \in [0,1]$ is the error made by the supreme court.¹⁹ The supreme court faces a cost per revised case (normalized by benefit per percentage point of uniformity) of c and society wants to maximize the level of uniformity. That is, a social planner wants to solve

$$\underset{n}{\text{Max}}\{\alpha(n) - cn\}$$

In order to calculate $\alpha(n) = \bar{r} - \underline{r}$ we notice that in the context of our example,

$$\bar{r} = r_L + \sqrt{\frac{Dn(1 - e)}{a(N - n(1 - e))}}$$

and

$$\underline{r} = r_L - \sqrt{\frac{Dn(1 - e)}{a(N - n(1 - e))}}$$

which give us

$$\alpha(n) = 2 \sqrt{\frac{Dn(1 - e)}{a(N - n(1 - e))}}$$

Uniformity increases with the reversal disutility (D) because a larger “sanction” is a deterrence

¹⁹ In other formulations we have imposed that $e = n/N$. The qualitative results hold but there is a considerable increment in the complexity of the analysis. As expected the number of socially optimal cases to revise decreases under this alternative specification.

against the lower court decision to implement his own preferred legal rule. In the same way, uniformity increases with the probability of revised cases (n/N) because the expected disutility from a deviation from the legal rule also goes up. Instead, uniformity decreases with the utility obtained by the lower court judge when it enforces the rule that he would like (a) because in that case the expected reward from a deviation of the legal rule increases. Finally, uniformity also decreases with the size of the errors made by the supreme court (e) because then revision becomes less of a credible threat to lower courts. Lower court judges know that they can enforce their preferred rule and that decision will be sustained even after revision with certain probability.

It follows that the first best number of revisions is the one that solves

$$\text{Max}_n \left\{ 2 \sqrt{\frac{Dn(1-e)}{a(N-n(1-e))}} - cn \right\} \quad (2)$$

which defines F.O.C. and S.O.C. as follows

$$\text{FOC: } N \sqrt{\frac{D(1-e)}{an(N-n(1-e))^3}} - c$$

$$\text{SOC: } -\frac{N}{2} \sqrt{\frac{D(1-e)(N-4n(1-e))^2}{an^3(N-n(1-e))^5}} < 0 \forall n < \frac{N}{1-e}$$

As is shown in figure 1 (which draws F.O.C.), there are two potential scenarios with different implications for the optimal number of revised cases (n^*). We separate these scenarios in terms of the value of the disutility in case of a reversal (D).

<<Insert Figure 1 about here>>

Scenario 1: If $D < \bar{D} = n^* - \frac{2(n^*)^2}{N} (1-e)$ then (2) defines two possible solutions but only

the first one is a maximum and determines n^* .²⁰ Changes in the parameters of the model have the following impact on n^* . Because an increment in the disutility increases the expected cost associated with a revision of a lower court decision, the incentives faced by the lower courts to enforce the legal rule go up and ergo the marginal increment in uniformity due to a marginal increment in the number of revised cases also goes up. It follows that the optimal number of revisions goes up with the size of the disutility. An increment in either the total number of cases, the utility obtained by the lower court due to a deviation from the legal rule, the cost of a revision or the error that the supreme court can commit have the effect of reducing the optimal number of revisions, although for very different reasons. While a larger cost of revision discourages revisions, an increment in the total number of cases reduces the expected disutility of a revision that needs to be reverted. In addition, an increment in the utility obtained by the lower court due to a deviation from the legal rule reduces the relative cost of the expected disutility if the supreme court revises the decision.

Finally, although there are two effects associated with an increment in the probability of error committed by supreme courts, both of them push down the optimal number of revisions. On one hand, more mistakes imply a smaller expected reversal disutility or “punishment” in case of a deviation from r_L (that is because $(1 - e)Dn/N$ goes down with e), hence to compensate for the reduction in uniformity more cases should be revised. On the other hand, more mistakes also imply that a lower court benefits more if it enforces r_i instead of r_L (that is because $(1 - (1 - e)n/N)(u(r_i, r_i) - u(r_L, r_i))$ goes down with e) hence, more revisions are required to verify

²⁰ In addition there exist two complex solutions with imaginary roots.

that lower courts are enforcing r_L . The previous considerations are summarized in Table 1.

Table 1					
	Disutility (D)	Cases (N)	Cost (c)	Court (a)	Error (e)
$\frac{\partial n^*}{\partial}$	↑	↓	↓	↓	↓

Scenario 2: If $D \geq \bar{D} = n^* - \frac{2(n^*)^2}{N}(1 - e)$ then $n^* = N$.²¹ The marginal benefits associated with a new revision $\sqrt{DN^2(1 - e)/(a(N - n(1 - e)))^3}$ dominate the marginal costs c when D is large enough.²²

A non-intuitive implication of the previous analysis is that an efficient supreme court operating in a legal system in which reversal disutility for overrules is small (civil law) should revise a lesser number of cases, but an efficient supreme court operating in a legal system in which disutility for overrules are large (common law) should revise a greater number of cases. Exactly the opposite of what happens in reality. One possible explanation is that supreme courts are not as rational/efficient as we believe or that they are constrained by non-efficiency considerations (i.e. keeping legal traditions, a constitutional right to appeal, among others). A second possible explanation is that our model would benefit from the consideration that a central goal for a common law supreme court is to vindicate the judicial law-making role played by precedents in the judicial system. In the next subsection we add that possibility and readdress the question for

²¹ Strictly speaking, there are four imaginary solutions.

²² Even when the F.O.C. might define two solutions the maximum becomes a local solution because it generates less utility than revising all the cases.

the optimal number of revisions.

5.2. Judicial law-making and optimal number of case revision

An important difference in the role played by the supreme court in a common law and a civil law legal system is that for the first case the supreme court is called to constructively improve the set of laws and rules that regulate a country (judicial law-making). Independent of the precise level of activism that courts are called to play, both scholars and practitioners (legislators, judges and lawyers) understand that the decisions of higher courts will tremendously impact the future interpretations and applications of the law. *Brown vs Board of Education of Topeka (1954)*, *Roe vs Wade (1973)* and *Bush vs Gore (2000)* are only some prominent examples of the numerous U.S. Supreme Court decisions that have had huge legal and real life impact. The same cannot be said about the decisions made by civil law supreme courts. While their main role is to verify the consistency and uniformity of the decisions made by lower courts, civil law supreme courts are not called to develop law.

Our question, then, is how might we incorporate the role of a supreme court as source of law in our model? An initial temptation is to include in (2) a benefit proportional to every case decided by the supreme court that goes beyond the preservation of uniformity. However, such a benefit would distort our model in at least three ways. First, because in our formulation we are not considering other sources of law (such as Congress), the inclusion of an extra benefit would incorrectly bias common law supreme courts towards choosing more cases than civil law supreme courts. Second, as we do not have a clear measure of the quality of a decision we could be assuming that more decisions made by the supreme court will unambiguously benefit the body of law and society that is not granted. There are efficient and inefficient decisions made by the supreme court

and it is not clear whether or when the supreme court is a better source of law than the legislature. Third, as we are not considering time restrictions, if we only add a benefit associated with a case decision we would not consider the negative effect that the number of revised cases would likely have on the quality of an individual decision made by the supreme court.

Instead of adding an additional benefit, here we consider that the common law supreme court's judicial law-making role can be better captured if we consider that the cost of deciding a case is much larger in common law than in civil law. The justification is that parameter c not only refers to the cost of resources (installations, technology, services) and salaries (justices and additional personnel) required by the judicial system to support the decision of a case but in addition that parameter refers to the opportunity cost suffered by society because of the time that the supreme court uses to solve a case. Each time that a common law supreme court resolves a case, it also resolves a substantial dispute in the interpretation, definition or update of the law. And the exercise of motivating judgments with repercussions for future cases, such as a common law supreme court dictating binding precedents, seems to be one of the most time consuming tasks for the judges (NORKUS, 2015, p. 9).

Although a similar argument can be increasingly made for civil law supreme courts, the ratio of cases that relate to contradictory interpretations of the law is considerably smaller in the last system compared to the former. In France, for example, only a minor portion of the supreme court of cassation's caseload seems important for legal clarification and development (FERRAND, 2016, p. 12). In a caseload of 20,000 total decisions per year, estimations suggest that only 120 cases in private law and 206 in criminal are necessary to create precedents (TROPER & GRZEGORCZYK,

1997, p. 106).²³

Hence, we assume here that $c_{CoLaw} > c_{CiLaw}$. But if that is the case then we can easily prove that if D_{CoLaw} is the disutility in a common law reversal and D_{CiLaw} is the disutility in a civil law reversal such that $D_{CoLaw} \gg D_{CiLaw}$ then there always exist c_{CoLaw} and c_{CiLaw} with $c_{CoLaw} \gg c_{CiLaw}$ such that the optimal number of revised cases in common law will be much smaller than the same in civil law. The next proposition formalizes and proves that result.

Proposition 2: *Suppose that a common law and a civil law legal systems have the same parameters*

(N, e, a) and $\bar{D}_{CoLaw} > D_{CoLaw}$; $\bar{D}_{CiLaw} > D_{CiLaw}$ such that $D_{CoLaw} \gg D_{CiLaw}$. Then there always exist c_{CoLaw} and c_{CiLaw} with $c_{CoLaw} \gg c_{CiLaw}$ such that $n_{CoLaw}^ \ll n_{CiLaw}^*$.*

Proof: We can re-write FOC as

$$\frac{D(1-e)}{a(N - n^*(1-e))^3 (c/N)^2} = n^*$$

Then if we define $c_{CoLaw} = D_{CoLaw} \gg c_{CiLaw} = D_{CiLaw}$ it follows that

$$\frac{(1-e)N^2}{a(N - n_{CoLaw}^*(1-e))^3 D_{CoLaw}} = n_{CoLaw}^*$$

from where it follows

$$\frac{D_{CoLaw}}{D_{CiLaw}} = \frac{(N - n_{CiLaw}^*(1-e))^3 n_{CiLaw}^*}{(N - n_{CoLaw}^*(1-e))^3 n_{CoLaw}^*}$$

or $n_{CoLaw}^* \ll n_{CiLaw}^*$ (two solutions are imaginary. In addition, the first real solution defines a

²³ In Chile, to offer another example, from a total of 461 and 522 petitions for revisions associated to Labor disputes during 2011 and 2012, only 98 (18% of the total) and 129 (20% of the total) corresponded to petitions to revise substantial issues (data collected by the authors).

maximum and the second real solution defines a minimum). **End of Proof.**

5.3. Court heterogeneity

It is direct to verify that the results from Propositions 1 and 2 hold when the distribution of preferences for the lower courts is not uniform but the function $f(r_i)$ with $\int_{-\infty}^{\infty} f(r_i) dr_i$. In that case, uniformity is given by $\alpha = \int_{\underline{r}}^{\bar{r}} f(r_i) dr_i$. Proposition 1 still holds because \underline{r} and \bar{r} are still given by $Dp/(1-p) = u(\bar{r}, \bar{r}) - u(r_L, \bar{r}) = u(\underline{r}, \underline{r}) - u(r_L, \underline{r})$ and the utility function is concave in both arguments. In addition, Proposition 2 is still true because (2) now becomes

$$\text{Max}_n \left\{ \int_{r_L - \sqrt{\frac{Dn(1-e)}{a(N-n(1-e))}}}^{r_L + \sqrt{\frac{Dn(1-e)}{a(N-n(1-e))}}} f(r_i) dr_i - cn \right\}$$

which allows us to replicate the sensitivity analysis of table 1.

A non-trivial implication of a more general formulation of lower court preferences is that now we are able to identify the legal rule r_L that maximizes judicial decisions uniformity.²⁴ To see that suppose that $f(r_i)$ is the normal distribution $N(\mu, \sigma)$ then uniformity becomes $\alpha = \int_{\underline{r}}^{\bar{r}} \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}} dx$ which first order condition with respect to μ is

$$\frac{1}{\sigma\sqrt{2\pi}} \left(e^{-\frac{(\underline{r}-\mu)^2}{2\sigma^2}} - e^{-\frac{(\bar{r}-\mu)^2}{2\sigma^2}} \right) = 0$$

which is true when $\mu = r_L$ because $\bar{r} - r_L = r_L - \underline{r}$. Hence, judicial uniformity is maximized if the legal rule is set equal to median value of the distribution of ideologies of the lower courts.

²⁴ When the distribution is Uniform then the value of r_L becomes irrelevant.

5.4. Calibrations

To better appreciate the implications of our previous considerations next we calibrate and simulate the model developed in subsection 5.1. We do that in order to determine an approximate value for the optimal number of revisions. We assume that the ratio of errors is 5% ($e = 0,05$) and we normalize $a = 1$.

First we consider the case of Chile in which $N = 5,000$. Then we consider the case of the USA in which $N = 8,023$. First we show that, according to our model, in Chile very likely the optimum is to revise a 100% of the cases. The reason is that the maximum value of n^* in Scenario 1 corresponds to 1.316 revisions which is farther away from the 3.250 that the Chilean Supreme Court actually revises. That leads us to conjecture that the solution belongs to Scenario 2 which implies that $n^* = 5,000$. Then we show that in USA the optimum of 1.09% of revisions (or 87 cases) takes place when the ratio D/c^2 is equal to 680.000.

Tables 2 and 3 show the optimum number of revisions as a function of D/c^2 when $N = 5,000$ and $N = 8,023$ respectively.

(D/c^2)	n^* [number of cases]	n^* [% of N]
100,000	20	0%
1,000,000	228	4.6%
2,000,000	562	11.2%
2,560,000	897	18%
2,640,000	978	20%

2,720,000	1,096	22%
2,760,000	1,197	24%
2,774,000	1,278	25.6%
2,800,000	5,000	100%
4,000,000	5,000	100%

Table 3. When $N = 8,023$		
(D/c^2)	n^* [<i>number of cases</i>]	n^* [% of N]
100,000	12.5	0%
400,000	50.8	0,63%%
600,000	76,9	0,96%
680,000	87,4	1,09%
700,000	90,1	1,12%

6. CONCLUSIONS

It is frequently observed and accepted that differences in the quantity of petitions revised by the supreme court in countries that subscribe to the common law versus the civil law traditions are essentially explained by historical events (WIJFFELS, 2013). Common law higher tribunals were called to actively participate in the development of the case-law instead of only applying the current legislation, as viewed in the civil law (MERRYMAN & PÉREZ-PERDOMO, 2007). Without contradicting this historical explanation, this paper elaborates a model that, developing on BRAVO-HURTADO (2014), explains the differences in the number of case revisions to supreme courts can

be also understood as two different approaches through which the common law and the civil law systems achieve and grant uniformity to the application of the law. Our model suggests that if the disutility suffered by judges due to reversals indeed is much higher in common law than in civil law, then the common law supreme court does not need to revise a large proportion of petitions in order to achieve a certain level of judicial uniformity. In a civil law legal system this is exactly the opposite. These two alternative ways of providing uniformity can be linked to a pipeline system in which two relief valves keep pressure constant. While common law tends to use one valve, civil law tends to use the other.

This simple principle can be extremely important if countries implement reforms that change either the probability of revision or unilaterally affect reversal disutility. For example, there is a current trend of restricting the number of revisions at the supreme court of civil law jurisdictions (GALIC, 2014b), such as German speaking jurisdictions (DOMEJ, 2014); Eastern-Europe (GALIC, 2014a) and in Latin-American countries like Chile (BRAVO-HURTADO, 2013). These reforms usually include, on the one hand, some kind of ‘access filter’ which allows their supreme court better control of their docket and, on the other hand, an increase in the force of precedents that guides future judicial decision-making. According to the model developed in this paper, we can suggest that, if that trend is not complemented with adjustments of the lower judges’ reversal disutility (ideological, reputational or career promotion), the result could be an important alteration in the level of uniformity in the application of the law. Measures that can increase the reversal disutility are an increment in the visibility of judges, an increment in their incentives to move up in the hierarchical system or the establishment of more formal links between reversals and hierarchical promotions.

Further extensions of this line of research might include the modelling of the decisions of

the parties, specifically whether to litigate or appeal the lower court decisions. As rational agents, the parties will internalize the probability of a revision, plus the lower's judge reversal disutility, and this should endogenously determine the number of appeals. In addition, questions of levels of uniformity in the application of the law might be tested empirically if, for example, exogenous changes in the number of case revisions to supreme courts were taking place in the context of broader procedural reforms that affect access filters.

7. APPENDIX: MATHEMATICAL PROOFS

7.1. Proof of Lemma 1

(i): Take any judge with optimal rule $r_i \in [\underline{r}, \bar{r}]$, we want to show that he enforces legal rule r_L . That is

$$u(r_L, r_i) > u(r_i, r_i) - \frac{p}{1-p} D$$

In order to see that, notice that there exists $\pi \in [0,1]$ such that $r_i = \pi \underline{r} + (1-\pi) \bar{r}$. It follows because of the concavity of the utility function that

$$u(r_L, r_i) > \pi u(r_L, \underline{r}) + (1-\pi) u(r_L, \bar{r})$$

and because $u(r_L, \underline{r}) = (\underline{r}, \underline{r}) - \frac{p}{1-p} D$ and $u(r_L, \bar{r}) = (\bar{r}, \bar{r}) - \frac{p}{1-p} D$ and also

$u(r_i, r_i) = u(\underline{r}, \underline{r}) = u(\bar{r}, \bar{r})$ then

$$u(r_L, r_i) > \alpha \left(u(r_i, r_i) - \frac{p}{1-p} D \right) + (1-\alpha) \left(u(r_i, r_i) - \frac{p}{1-p} D \right) = u(r_i, r_i) - \frac{p}{1-p} D$$

which proves what we wanted. Now take the case in which $r_i \notin [\underline{r}, \bar{r}]$, we want to prove that

$$u(r_L, r_i) < u(r_i, r_i) - \frac{p}{1-p} D$$

but that also follows directly after we notice that

$$u(r_i, r_i) - \frac{p}{1-p} D = u(\underline{r}, \underline{r}) - \frac{p}{1-p} D = u(r_L, \underline{r}).$$

Hence the inequality that we want to prove

is equivalent to $u(r_L, r_i) < u(r_L, \underline{r})$ which is evidently true because of the concavity of u .

(ii) We only have to prove that $\frac{\partial \bar{r}}{\partial D} > 0$; $\frac{\partial \bar{r}}{\partial p} > 0$ and $\frac{\partial \underline{r}}{\partial D} > 0$; $\frac{\partial \underline{r}}{\partial p} < 0$. But that follows

immediately after we notice that

$$\frac{\partial \bar{r}}{\partial D} = \frac{-p/(1-p)}{\partial u / \partial r_i \big|_{(r_L, \bar{r})}} > 0; \quad \frac{\partial \bar{r}}{\partial p} = \frac{-D/(1-p)^2}{\partial u / \partial r_i \big|_{(r_L, \bar{r})}} > 0$$

$$\frac{\partial \underline{r}}{\partial D} = \frac{-p/(1-p)}{\partial u / \partial r_i \big|_{(r_L, \underline{r})}} < 0; \quad \frac{\partial \underline{r}}{\partial p} = \frac{-D/(1-p)^2}{\partial u / \partial r_i \big|_{(r_L, \underline{r})}} < 0$$

In which $\frac{\partial u}{\partial r_i} \big|_{(r_L, \bar{r})} < 0$ and $\frac{\partial u}{\partial r_i} \big|_{(r_L, \underline{r})} > 0$ because of the concavity of the utility function.

End of Proof.

7.2. Proof of Table 1

If we derivate FOC implicitly with respect to n^* and the other parameters we get

$$-\frac{N}{2} \sqrt{\frac{D(1-e)(N-4n^*(1-e))^2}{a(n^*)^3(N-n^*(1-e))^5}} dn^* - dc = 0 \Rightarrow \frac{dn^*}{dc} = -\frac{2}{N} \sqrt{\frac{a(n^*)^3(N-n^*(1-e))^5}{D(1-e)(N-4n^*(1-e))^2}} < 0$$

$$-\frac{N}{2} \sqrt{\frac{D(1-e)(N-4n^*(1-e))^2}{a(n^*)^3(N-n^*(1-e))^5}} dn^* + \frac{N}{2} \sqrt{\frac{(1-e)}{Dan^*(N-n^*(1-e))^5}} dD = 0 \Rightarrow$$

$$\frac{dn^*}{dD} = \frac{n^*}{D(N-4n^*(1-e))} > 0$$

$$-\frac{N}{2} \sqrt{\frac{D(1-e)(N-4n^*(1-e))^2}{a(n^*)^3(N-n^*(1-e))^5}} dn^* - \frac{N}{2} \sqrt{\frac{D(1-e)}{a^3 n^*(N-n^*(1-e))^3}} da = 0 \Rightarrow$$

$$\frac{dn^*}{da} = -\frac{n^*(N-4n^*(1-e))}{a(N-n^*(1-e))} < 0$$

$$-\frac{N}{2} \sqrt{\frac{D(1-e)(N-4n^*(1-e))^2}{a(n^*)^3(N-n^*(1-e))^5}} dn^* + \sqrt{\frac{D(1-e)}{an^*(N-n^*(1-e))^3}} \left(1 - \frac{3N}{2(N-n^*(1-e))}\right) dN = 0 \Rightarrow$$

$$\frac{dn^*}{dN} = -\frac{n^*(N+2n^*(1-e))}{N(N-4n^*(1-e))} < 0$$

$$-\frac{N}{2} \sqrt{\frac{D(1-e)(N-4n^*(1-e))^2}{a(n^*)^3(N-n^*(1-e))^5}} dn^* - \frac{N}{2} \sqrt{\frac{D(N+2n^*(1-e))^2}{an^*(1-e)(N-n^*(1-e))^5}} de = 0 \Rightarrow$$

$$\frac{dn^*}{de} = -\frac{n^*(N+2n^*(1-e))}{(1-e)(N-4n^*(1-e))} < 0$$

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9. FIGURES

Figure 1: Optimal number of revisions (FOC)

