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Understanding the Time to Court Case Resolution: A Competing Risks Analysis Using Belgian Data

Abstract

Court delays are a frequent concern, yet what explains court case duration remains incompletely understood. We study the time to court case resolution by drawing on a detailed case-level dataset of civil suits filed at a major Belgian court. We utilize the competing risks regression framework to address the typically neglected heterogeneity in the modes of court case resolution and examine the role of a wide range of both time-invariant and time-varying covariates. Controlling for judge fixed effects, we find substantial disparities in the effect of party and case characteristics on the time to settlement versus trial judgment. Exploiting the de facto random assignment of cases to serving judges within the court's chambers, we further find that judge characteristics matter for time to trial judgment, but not for time to settlement. Modeling heterogeneity in the modes of court case resolution is therefore central to understanding of court case durations.

JEL-Codes: K410, K120, P480.

Keywords: court delays, competing risks, trial judgment, settlement, Belgium.

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1. Introduction

Court delays are a concern in many jurisdictions worldwide (see, e.g., Djankov et al. 2003, CEPEJ 2014). Overly long duration of court cases increases private and public legal expenditures, perpetuates the uncertainty faced by the disputing parties, redistributes wealth from plaintiffs to defendants, and provides incentives for vexatious litigation which in turn further increases court backlogs (Fenn and Rickman 2014). Slow dispute resolution has been shown to inter alia adversely impact contracting, entrepreneurship, industrial activity, credit market performance, and economic growth (Chemin 2009a, 2009b, 2012; Jappelli et al. 2005, Visaria 2009, Melcarne and Ramello 2016). Accordingly, at least in environments where basic democratic constraints prevent politically motivated show trials, the speed with which courts resolve cases has been viewed as a key dimension of court efficiency (Ramello and Voigt 2012, Voigt 2016).

Yet despite significant policy importance of the topic, rigorous empirical studies of the determinants of the time that courts take to resolve civil cases are few and limited in terms of geographic coverage (Voigt 2016). Existing analyses of factors contributing to court delays often rely on average case durations or other aggregated country, court, and judge level statistics, such as caseloads and the volume of disposed cases, which are in turn used as input for the computation of proxies for individual case disposition times (see, e.g., Buscaglia and Ulen 1997, Chemin 2009a, 2012; DiVita 2010, 2012a; Mitsopolous and Pelagidis 2007, Espinosa et al. 2015, Guerra and Tagliapetra 2017).[1] The resulting analyses have generated valuable insights about the role of court organization and resources (Buscaglia and Ulen 1997, Mitsopolous and Pelagidis

[1] A further set of studies indirectly draw inference about the determinants of the time to court case disposition by using aggregated court-level measures such as the volume of resolved cases, clearance rate, and congestion rate as the outcomes of interest. See Voigt (2016) for a recent survey of the literature on judicial efficiency.

2007, Guerra and Tagliapetra 2017), complexity of legislation (Di Vita 2010, 2012a), and economy-wide legal reforms (Visaria 2009, Chemin 2009a, 2012; Espinosa et al. 2015).

Reliance on aggregated data to measure court disposition times, however, comes at a cost. First, aggregated statistics mask the significant heterogeneity in the speed and procedural dynamics of resolution of individual cases. Second, aggregated data hide the fact that courts dispose cases via a range of modes of disposition, with trial judgments representing only one, and often not the most frequent, mode of disposition (see, e.g., Galanter 2004, Eisenberg and Lanvers 2009, Hadfield 2004, Dimitrova-Grajzl et al. 2014). In an attempt to advance our understanding of the factors influencing court disposition times, only a limited number of existing studies have been able to utilize court case-level data. Furthermore, case-level datasets utilized thus far have been either relatively small (Grembi and Garoupa 2013, Bielen et al. 2015) or comparatively scarce in terms of information about case characteristics and the procedural aspects of case resolution (Eisenberg and Farber 1997, Deffains and Doriat 1999, Heise 2000, Di Vita 2012b, Christensen and Szmer 2012, Somaya 2016).[2]

In this paper, we contribute to the literature on the determinants of the time to court case resolution by exploring a novel case-level dataset on a subset of civil disputes collected from a major court in Belgium, a EU member state where the slow pace of justice has been a persistent policy concern (High Council of Justice 2012). The combination of within-court research design, fine-grained data, and use of the competing risks approach enables us to explicitly address the largely neglected heterogeneity in the modes of court case disposition and the resulting

[2] A subset of studies using case-level data focuses exclusively on the timing of settlement (see, e.g., Kessler 1996, Fournier and Zuehlke 1996, Spurr 1997, Boyd and Hoffman 2013, Fenn and Rickmann 2014, Westeus 2014, Ayuso et al. 2015, Grajzl and Zajc 2016). Many of these studies do not use court data, but rather, for example, insurance company data to track the evolution of a dispute from its very onset.

consequence that different case, party, and judge characteristics may exhibit different effect on the timing of different modes of case resolution such as settlement and trial judgment.

To our knowledge, Eisenberg and Farber (1997) and Somaya (2016), who respectively study civil and patent suits filed in the U.S. federal courts, are the only contributions that have applied the competing risks approach to study the determinants of the time to court case disposition and accordingly examined both the time to settlement and the time to trial judgment. We, in contrast, rely on a within-court research design, but have access to more detailed information about the underlying court cases and are in comparison with previous studies thus able to offer a more comprehensive evaluation of the role of different covariates. Specifically, in addition to examining the role of a wide range of micro-level case characteristics, some of which have been found to be empirically important in prior studies on the timing of civil case resolution (e.g., Eisenberg and Farber 1997, Heise 2000, Christensen and Szmer 2012, Grembi and Garoupa 2013, Bielen et al. 2015), we are able to explore the role of thus far unexplored procedural events such as the completion of hearings, exchange of pleadings, and availability of expert reports.

Furthermore, our paper is the first to examine whether, and if so how, judge characteristics matter for the timing of alternative modes of court case resolution. As legal realists have long emphasized (Posner 1993, Stephenson 2009), the administration of justice is often critically shaped by extraneous, extralegal factors (see, e.g., Danziger et al. 2011). We would thus expect judge characteristics to possibly affect the timing of court case resolution and, moreover, specific judge characteristics to plausibly exert a different effect on the timing of settlement versus trial judgment. Importantly, to assess the ceteris paribus effect of judge characteristics, we are able to exploit the fact that the administrative assignment of filed cases to

serving judges within the court is, as we explain below, de facto random and hence independent of judge, disputing party, and case characteristics. Our estimates are therefore not confounded by the attributes of the parties and the case as they would be if the court deliberately assigned specific cases to specific judges based on the judges' observable characteristics.

The present paper also differs substantially both in scope and in breadth from a recent contribution by Bielen et al. (2017) who draw on a related Belgian case-level dataset but focus exclusively on the determinants of the length of time that judges spend deliberating on a case to articulate a verdict. In particular, in contrast to Bielen et al. (2017), we utilize a considerably larger number of court cases, make use of time-varying case-level covariates, and, most notably, examine how party, case, and judge characteristics impact the timing of settlement versus the timing of trial judgment.

To preview our results, we find that many party, case, and judge characteristics indeed exhibit a very different effect on the time to settlement versus the time to trial judgment, a result that directly justifies the use of the competing risks approach. For example, while the number of parties and the presence of government among the disputing parties ceteris paribus increase the time to trial judgment, they do not affect the time to settlement. Similarly, procedural events such as the completion of the last opening hearing and arrival of the expert report, by revealing new information about the merits of the case, all else equal reduce the time to settlement, but at the same time increase the time to trial judgment, presumably because a completed opening hearing or expert report foreshadows further time-consuming procedural steps. Finally, judge characteristics exhibit no effect on the time to settlement, a finding suggesting that the timing of settlement is primarily driven by parties' autonomous decisions rather than judicial activism. In contrast, judge's gender, age, and experience are empirically important determinants of the time

to trial judgment. Our analysis therefore suggests that modeling the typically overlooked heterogeneity in modes of court case disposition is essential to understanding the role of the factors affecting the time to court case resolution.

The rest of the paper is organized as follows. Section 2 offers a quick overview of the Belgian judicial system. Section 3 introduces the data. Section 4 presents the variables and articulates our hypotheses. Section 5 lays out our empirical approach and presents the results. Section 6 concludes.

2. A Brief Institutional Background on the Belgian Judicial System

2.1. Courts

Belgian courts are structured into four levels. At the highest (federal) level is the Court of Cassation. The courts of appeal and the labor courts are located in each of the five judicial areas, which are in turn divided into 27 judicial districts. Each district encompasses four types of first instance courts: a first-instance court of general jurisdiction (subdivided into a civil, criminal, and family bench), a labor court, a commercial court, and a police court. The justice of the peace courts are small claim courts and are organized on the level of the 187 judicial cantons.

2.2. Civil procedure

Belgium has a civil law tradition largely influenced by the French legal system. Civil court proceedings start with the filing of a claim at the court (usually by means of a writ of summons). Forum shopping is not allowed, but the law in general allows the parties to mutually agree on the court of jurisdiction in the event of a dispute. After the claim is filed, the court schedules one or more opening hearings to discuss the basic facts of the case and the timeline of the exchange of written pleadings. In Belgium, written pleadings, which include both legal and factual arguments concerning the dispute, take precedent over oral arguments presented in court. The judge is

therefore required to motivate his or her decision based on the submitted pleadings, but is under no legal obligation to take into account the oral arguments. Setting up of the calendar for exchange of pleadings is the prerogative of the parties. The judge prepares a calendar upon his or her own motion only when the disputing parties fail to agree on a pleading calendar.

When the subject of a dispute entails an understanding of a complex or technical matter, the court appoints an expert. Court expert may be requested by one of the disputing parties or upon the judge's own motion. The expert prepares and delivers a report on the case. Quite often, disputing parties subsequently exchange further pleadings to discuss the expert's findings. The expert's advice is not binding. In practice, however, judges tend to attach considerable importance to the expert reports.

Trial hearings are completed once the judge decides that there is enough information to decide on the merits of the dispute. The judge is expected to announce the verdict within one month from the last trial hearing.

2.3. Judges

Judges are appointed for life following a selection procedure supervised by the High Council of Justice. Lawyers with sufficient professional experience are eligible to serve as a judge after passing either an aptitude exam (in the case of candidates with at least 20 years of experience) or a professional competence exam (in the case of candidates with at least ten years of experience). Candidates without any professional legal experience are required to pass an entrance exam and complete a mandatory judge training program that includes a judicial internship.

Judicial remuneration is regulated by federal law and predominantly determined by judge's experience. Except for court presidents and vice-presidents, who are granted a salary increase for performing managerial tasks, judges are not eligible for salary bonuses. Belgian law, however,

does allow a judge's salary increase to be withheld for up to six months in case of underperformance. Commitment to resolving cases without undue delay is among the key criteria for performance evaluation.

3. Data

3.1. Sample

Our sample consists of cases adjudicated at the civil bench of the Antwerp first-instance court of general jurisdiction. The Antwerp court of first instance is the largest first-instance court of general jurisdiction in the Flanders region. The court hears about ten percent of all civil cases filed at the first-instance courts of general jurisdiction in Belgium. The Antwerp court is thus one of Belgium's key adjudicative forums. For purposes of this project, we were granted confidential access to the court archives containing files on contract and construction cases that were initiated between January 1, 2008 and December 31, 2013 and were either resolved or still pending on October 1, 2014.

Contractual disputes occur across industries and societal domains and are thus widely representative of the Belgian economy and society (Bielen et al. 2017). Construction cases represent a specific type of contractual cases tracked separately by the courts. The timing of resolution of construction cases has been deemed particularly relevant in Belgium because it is expected to affect foreign investments in the industry (Iyer et al. 2008, House of Representatives 2006, High Council of Justice 2012). Together, contract and construction cases represent nearly one half of all cases filed at the civil bench of the Antwerp court of first instance and, hence, amount to a very significant portion of litigation taking place at one of Belgium's central courts.

We initially hand-collected a random sample of a more than 1,000 contract and construction cases adjudicated in four construction chambers and three contract chambers of the

civil bench of the Antwerp first-instance court of general jurisdiction. To determine the composition of the initial sample, we used stratified sampling based on case type and year of filing. We then dropped all cases that were dismissed on procedural grounds (e.g. because they were filed at a wrong court) and cases disposed via default judgment (when no real adjudication takes place). We further dropped cases for which the underlying case files entailed missing or evidently erroneous records. Our final sample consists of 939 cases (451 contract cases and 488 construction cases), 737 of which were resolved either via settlement or trial judgment and 202 of which were still pending on October 1, 2014. The dataset analyzed in this paper is therefore a very significantly expanded and more detailed version of the dataset used by Bielen et al. (2017) to study the duration of judicial deliberation.

3.2. Settlements, Trial Judgments, and Durations

Table 2 provides basic summary statistics on case duration for cases that were disposed via settlement, trial judgment, or resolved via any of the two means of disposition. Among the 737 cases that were resolved, 135 (18 percent) were disposed via settlement and 602 (82 percent) were disposed via trial judgment. The share of settlements (court judgments, respectively) in our sample is thus notably smaller (greater) than the corresponding numbers for civil cases disposed in the U.S. courts (Galanter 2004, Hadfield 2004), but consistent with the empirical patterns about the modes of civil case disposition in other European civil-law jurisdictions for which data have been reported, for example, Slovenia (Dimitrova-Grajzl et al. 2014, Grajzl and Zajc 2016).

In terms of duration, it takes on average 445 days for parties to reach an out-of-court settlement, 494 days to trial judgment, and 485 days to case resolution via any of the two modes of disposition. Thus, settlements take somewhat less time than trial judgments. The difference in average durations between the two modes of disposition, however, is relatively small and thus

not quite in line with the frequently made argument that it is trial judgments rather than settlements that primarily lead to court delays (see, e.g., Kravitz 2005).

Figure 1 provides the respective frequency distributions of the incidence of settlement, trial judgment, and resolution via any means by day since filing of the claim. All three distributions are positively skewed. A non-trivial proportion of cases took a long time to disposition. Time to disposition exceeds 900 days for 13 cases disposed via settlement (9.6 percent of all settlement); 64 cases disposed via court judgment (10.6 percent of all trial judgments); and 77 cases resolved via any of the two modes of disposition (10.4 percent of all resolved cases).

Figure 2 plots smoothed non-parametric estimate of the settlement and trial judgment hazards. Trial judgment hazard exceeds settlement hazard throughout the period since filing of the claim. Both trial judgment hazard and settlement hazard are non-monotonic. Trial judgment (settlement, respectively) hazard is greatest at around 400 (1,300) days since filing of the claim.

4. Explanatory Variables and Hypotheses

The time that a court takes to dispose a case will in general depend on a variety of factors, including the characteristics of the case, the disputing parties, and the adjudicators. Yet while litigation and administration of justice have been studied by scholars in law, economics, and political science, there currently exists no unified theoretical framework for understanding of the *timing* (as opposed to incidence per se) of alternative modes of court case resolution such as settlement and trial judgment. Thus, to justify our covariates and articulate specific hypotheses concerning the covariates' effect on the timing of settlement and trial judgment, respectively, we draw on a diverse set of arguments put forth by the different strands of the literature on litigation and administration of justice. These include (i) the rational choice theories (see, e.g., Kaplow and

Shavell 2002, Spier 2007, Farmer and Pecorino 1996) that attribute parties' decision to pursue trial over settlement to either exogenously determined or asymmetric information-induced divergent expectations[3]; (ii) the party capability theory that views court outcomes as a function of party-level resource stratification (e.g., Galanter 1974, Atkins 1991); (iii) theories of judicial decision-making that stress the importance of extralegal factors and judge characteristics (e.g., George and Epstein 1992, Danziger et al. 2011, Peresie 2005, Ramseyer 2012); and (iv) behavioral approaches to litigation that highlight the role of emotions (e.g., Kaufmann and Stern 1988, Huang and Wu 1992, Cross 2000, Blumenthal 2005).

Some of our covariates, such as the number of disputing parties or the value of the stakes, are time-invariant in that their value does not change during case resolution. Others, such as the completion of pleadings or availability of an expert opinion, however, are time-varying in that their value changes during the course of case resolution (for example, upon the occurrence of the relevant event). Accordingly, we group our covariates into three distinct groups: time-invariant party and case characteristics, time-varying case level characteristics, and time-invariant judge characteristics. Table 1 provides variable definitions and description.

4.1. Time-Invariant Party and Case Characteristics

Table 2 summarizes the descriptive statistics for time-invariant party and case characteristics. 43 percent of the cases in our data feature multiple parties on either the plaintiff or defendant side. The presence of multiple parties increases the complexity of both settlement negotiations and adjudication, which in turn increases the scope for divergent expectations held by the disputing

[3] For the exogenous-beliefs version of the divergent expectations theory of litigation, see e.g. Landes (1971), Gould (1973), Posner (1977), Shavell (1982), and Priest and Klein (1984). For rational-choice theories of litigation that emphasize informational asymmetries as the source of parties' divergent expectations, see e.g. P'ng (1983), Bebchuk (1984), Nalebuff (1987), Reinganum and Wilde (1986), Spier (1992), Daughety and Reinganum (1994), and Friedman and Wittman (2007).

parties. We therefore expect that the presence of multiple parties ceteris paribus increases both the time to settlement and the time to trial judgment.

Three types of disputing parties appear in our sample: individuals, legal persons (businesses and non-profits in various legal forms), and government (e.g., Flemish government or municipalities). Individuals are among the disputing parties in 91 percent of the cases. Legal persons are among the disputing parties in 84 percent of the cases and government in 1.5 percent of the cases. 75 percent of cases feature some combination of individuals and legal persons as the disputing parties. 15 percent of the cases involve disputes among individuals only and 8 percent of the cases involve disputes among legal persons only. According to the party capability theory of litigation (see, e.g., Galanter 1974, Atkins 1991), different types of disputing parties possess different resources and, thus, differ in their litigation success. Businesses and government, for example, in general have deeper pockets than individuals and hence may afford to engage in prolonged litigation. In comparison with natural persons and the government, legal persons may at the same time also have an incentive to settle disputes faster because of comparatively higher opportunity costs of delayed litigation. Relative to the case where all disputing parties are individuals (i.e. natural persons), we expect the presence of a legal person among the disputing parties to either increase or decrease both the time to settlement and the time to trial judgment, ceteris paribus. All else equal, we anticipate the presence of government among disputing parties to increase both the time to settlement and the time to trial judgment.

In the vast majority of the cases, parties are represented by an attorney. At least one self-represented party appears in 23 percent of the cases. Involvement of attorneys, on the one hand, provides parties with valuable information about the merits of the case, which in turn reduces the extent of divergence of parties' expectations and facilitates faster settlement. Yet, on the other

hand, attorney compensation in Belgium very often entails hourly fees. Based on the principal-agent theory of legal representation (see, e.g., Shavell 2004), attorneys may thus also have an incentive to increase the duration of litigation. Thus, all else equal, parties' self-representation can either increase or decrease the time to both settlement and trial judgment.

The mean claim value in our sample is about EUR 32,000. However, the variation in this variable is large and the value of the claim exceeds EUR 500,000 in seven out of 939 cases. There are a number of different hypotheses that the literature has proposed concerning the effect of the stakes on litigation outcomes. According to the exogenous-beliefs version of the divergent expectations theory of litigation (Landes 1971, Gould 1973, Posner 1977, Shavell 1982, Priest and Klein 1984), higher stakes all else equal decrease the margin by which the plaintiff must be overoptimistic to pursue trial and, thus, increase the prospects of trial over settlement. In the asymmetric information-based theories of litigation, however, the effect of stakes on the prospects of trial is in general ambiguous (Farmer and Pecorino 1996); depending on the model's assumptions, stakes may either increase or decrease the prospects of trial. Furthermore, higher stakes also imply greater discounted pecuniary and non-pecuniary losses for the plaintiff from delay in adjudication; thus, higher stakes may induce the parties and the judge to speed up case disposition, whether via settlement or trial judgment. The value of the claim may thus either increase or decrease both the time to settlement and the time to trial judgment.

Court experts are appointed in 24 percent of the cases. Involvement of an expert indicates that the case is complex, which increases the scope for parties' divergent expectations about the case's merits. In addition, involvement of an expert requires the judge to invest significant effort in deliberating on the merits of the case. All else equal, we expect the involvement of an expert to increase both the time to settlement and the time to trial judgment.

In Belgium, the default arrangement is that the pleading calendar is drafted by the disputing parties (see Section 2.2). The judge seizes control over the pleading calendar only if disputing parties are unable to agree on the deadlines. In our sample, the judge is in control over the pleading calendar in 35 percent of the cases. That the judge has had to set up the calendar is often an indication of a high level of antagonism between the disputing parties and, hence, implies that the case is particularly contentious and/or complex. We expect judicial control over the pleadings calendar to increase both the time to settlement and the time to trial judgment.

4.2. Time-Varying Case Level Covariates

We use time-varying case level covariates to model ten different procedural events: the completion of the last opening hearing, the completion of the last court hearing, the arrival of the expert report, and the exchange of seven consecutive pleadings (see Table 1). All of the covariates utilized to model these events are discrete time-varying in that they change value in a discrete fashion during the course of case resolution. Specifically, for each of these covariates, we define an indicator variable that equals zero before the occurrence of the event (e.g., last opening hearing, last court hearing, arrival of expert report, or exchange of *i*-th pleading) and one after the event.

Figures 3 and 4 show the distribution of the timing of occurrence of abovementioned events. Most last opening hearings are completed rather quickly, whereas the timing of the last court hearing as well as the timing of the arrival of the expert report exhibit significant variation (Figure 3). The distributions of the timing of exchange of consecutive pleadings follow the expected pattern: cases featuring a large number of pleadings exchanges (five or more) are relatively few, and the modal time of the exchange of pleadings is longer in the case of later

pleading exchanges (that is, those that had already been preceded by multiple prior pleading exchanges) than in the case of earlier pleading exchanges (Figure 4).

Opening hearings provide an opportunity for the parties and their legal representatives to refine their information about the merits of the case. Based on the divergent expectations theories of litigation, a reduction in the extent of divergence of parties' expectations about the expected trial outcome facilitates settlement. Thus, we expect the completion of the last opening hearing to reduce the time to settlement, ceteris paribus. On the other hand, for cases where settlement is unlikely, completion of the opening hearings marks the beginning of a series of further time-consuming procedural events such as the exchange of pleadings and subsequent trial. All else equal, we thus expect the completion of the last opening hearing to increase the time to trial judgment.

The last court hearing indicates the completion of all key procedural steps in court adjudication. Typically, no substantively new information about the case is revealed at this stage. If a case has reached the last court hearing and has not been settled, the contentious nature of the case may further impede settlement. Thus, holding all else constant, we expect the completion of the last court hearing to increase the time to settlement. At the same time, completion of the last court hearing signals the beginning of the very last step of a trial: judge's deliberation to articulate a verdict. We hence expect completion of the last court hearing to reduce the time to trial judgment, ceteris paribus.

Expert reports provide essential new information about the case and, as such, should facilitate settlement (see, e.g., Boyd and Hoffman 2013, Fenn and Rickman 2014). On the other hand, a critical understanding of the commissioned expert report also requires cognitive effort on behalf of the judge and is sometimes followed by a further exchange of pleadings among parties,

all of which delay the pace of the trial. Ceteris paribus, we expect the arrival of the expert report to decrease the time to settlement and increase the time to trial judgment.

Finally, the consecutive exchange of pleadings, the cornerstone of Belgian civil procedure, allows the disputing parties to engage in reflection and interpretation of the merits of the case and thereby enables the opposing parties to align their respective expectations about the case outcome. At the same time, however, the very exchange of pleadings is indicative of the litigious nature of the case. Indeed, repeated exchange of pleadings may contribute to the growing hostility among the disputing parties (see, e.g., Blumenthal 2005), which in turn impedes settlement. The exchange of pleadings could therefore either increase or decrease the time to settlement. On the other hand, any information revelation that takes place via the exchange of pleadings does not per se impact the pace of procedural events when a case is awaiting trial. We thus do not expect the exchange of pleadings to exhibit a discernible effect on the time to trial judgment.

4.3. Judge Characteristics

The 939 cases in our sample are adjudicated by 21 different judges. We have information about judge's gender, age, and length of experience as a judge at the time of the filing of each case. Unlike gender, a judge's age and length of adjudicatory experience (continuously) change value during the course of litigation. However, since we are interested in the effect of a judge's age at, and experience accumulated by, the time of a case filing, we model all three observable judge characteristics as time-invariant covariates. Descriptive statistics are provided in Table 2. 33 percent of the judges are females. Evidence about the effect of a judge's gender on adjudicatory outcomes is overall mixed. Some studies (see, e.g., Davis et al. 1993, Peresie 2005, Boyd et al. 2010) find that judge's gender matters. Other studies (see, e.g., Gruhl et al. 1981, Choi et al.

2011, Dimitrova-Grajzl et al. 2012) find that it does not. We thus refrain from articulating an a priori hypothesis regarding the effect of judge's gender and let the data speak for themselves.

The average age of a judge at the time of the filing of a case is 44 years. Older judges might be less concerned about promotion and are consequently less productive than younger judges (see, e.g., Schneider 2005, Choi et al. 2012: fn. 29). Another reason for a negative relationship between judge's age and performance is the burnout effect (Teitelbaum 2006, Christensen and Szmer 2012). We thus anticipate that, in comparison with cases adjudicated by younger judges, cases adjudicated by older judges all else equal take longer to both settlement and trial judgment. Finally, a judge in our sample on average possesses more than eight years of adjudicative experience at the time of the filing of a case. All else equal, more experienced judges have the advantage of being able to resolve cases and mediate disputes using accumulated on-the-job skills and thus at a faster pace (see, e.g., Teitelbaum 2006, Choi et al. 2009, 2010; Dimitrova-Grajzl et al. 2012). We expect that, in comparison with cases adjudicated by less experienced judges, cases adjudicated by more experienced judges ceteris paribus take less time to both settlement and trial judgment. Table 3 summarizes the hypothesized effects of individual covariates discussed in this section.

5. Empirical Approach and Results

5.1. Empirical Approach

To study the determinants of the time to court case disposition we use survival analysis (see, e.g., Cleves et al. 2010). Survival analysis methods allow us to address the issue of skewed distribution of durations (see Figure 1), mitigate sample selection bias by incorporating pending

cases into the estimation (see, e.g., Finkelstein et al. 2006)[4], and model the effect of covariates that vary during the course of litigation. Indeed, only a handful of existing analyses of the duration of dispute resolution (see, e.g., Boyd and Hoffman 2013, Fenn and Rickman 2014, Grajzl and Zajc 2016) have been able to examine the role of time-varying covariates.

A court case observed in our data may be disposed either via out-of-court settlement or via trial judgment. Moreover, only one of these two modes of disposition can occur first. Settlement and court judgment are therefore competing risk events which necessitates the use of the competing risks regression framework (see, e.g., Eisenberg and Farber 1997, Somaya 2016). To estimate cause-specific hazard ratios for each of the two observed modes of case disposition (settlement and trial judgment, respectively) for the full range of available covariates, we treat the competing risk event (trial judgment or settlement, respectively) and pending cases as right-censored observations (see, e.g., Cleves et al. 2010, Ch. 17). This approach yields valid estimates of cause-specific hazard ratios without relying on any kind of assumption of independence of competing risks (Andersen et al. 2012: 869; Noordzij et al. 2013: 2673).

Our data are observed on a daily frequency, while the length of the observed case duration spells often exceeds 1,000 days and can approach 2,000 days (see Table 2). We thus use continuous-time methods. To estimate cause-specific hazard ratios for settlement and trial judgment we first explored the workhorse semiparametric Cox regression framework. However, the proportional hazards assumption was routinely rejected by standard diagnostics tests.[5] We therefore resorted to estimating parametric competing risks models expressed in log-time metric

[4] An additional concern, which complicates empirical analysis of the determinants of court outcomes, is that the sample of filed cases might not be a random sample of all disputes. Given the inherent lack of data about the disputes for which a legal claim was never officially asserted (see, e.g., Cooter and Rubinfeld 1989: 1082), our analysis alleviates this concern via the inclusion of a broad set of party and case level controls (see, e.g., Bhattacharya et al. 2007).

[5] Both the global test based on Schoenfeld residuals and the tests based on the re-estimated model, where we interacted the covariates included in the basic Cox model with analysis time (see, e.g., Cleves et al. 2010), rejected the null hypothesis that the proportional hazards assumption holds.

(also referred to as accelerated failure time (AFT) models) that do not rely on the proportional hazards assumption (see, e.g., Cleves et al. 2010). Model selection based on the Akaike Information Criterion favored the log-logistic model over log-normal and generalized gamma models.

Thus, for each event of interest (settlement and trial judgment) we let

$$\ln(t_j) = \beta_0 + \mathbf{x}_j'\beta + \ln(\tau_j) = \beta_0 + \mathbf{x}_j'\beta + u_j, \quad (1)$$

where t_j is the time to failure via the event of interest for case j, β_0 is a constant, $\mathbf{x}_j$ is the vector of covariates, and β is the vector of coefficients of interest. $\tau_j=\exp(u_j)$ follows a log-logistic distribution and hence $u_j=\ln(\tau_j)$ follows a logistic distribution with mean 0 and standard deviation $\pi\gamma/\sqrt{3}$ (Cleves et al. 2010). Based on (1), the exponentiated coefficient for the k-th covariate, e^{β_k}, then captures the ratio between the expected time to failure for a case with covariate values $(x_1,\ldots,x_k+1,\ldots,x_n)$ and the expected time to failure for a case with covariate values $(x_1,\ldots,x_k,\ldots,x_n)$. Thus, if $e^{\beta_k} < 1 \quad (e^{\beta_k} > 1)$, the expected time to failure for the event of interest decreases (increases) as a result of a unit-change in covariate x_k, ceteris paribus (see Cleves et al. 2010: 241).

For each event of interest (settlement and trial judgment) we estimate two sets of regression specifications. In the first set of specifications, we aim to elucidate the role of party and case characteristics. To this end, we control for judge fixed effects and thus identify the effects of party and case characteristics off of within-judge variation. Judge fixed effects absorb any judge-specific idiosyncratic effects on time to case disposition.

In the second set of specifications, we instead aim to highlight the role of judge characteristics. To this end, we exploit the de facto random allocation of cases to judges at the Antwerp court. Specifically, at the civil bench of the Antwerp court, all newly filed cases are

allocated to the adjudicating (contract or construction) chambers by the judge presiding at the introductory court session. The key criterion of the choice of appropriate chamber is the chambers' workload. Multiple judges serve in each chamber, with each judge presiding over trial hearings on certain predetermined days of the week. Therefore, conditional on the choice of chamber, the assignment of cases to judges within any chamber is independent of case and judge characteristics and thus de facto random.[6] In the second set of specifications, we therefore control for chamber fixed effects and identify the effect of judge characteristics off of within-chamber variation. Chamber fixed effects absorb any effect of case type (contractual versus construction disputes are adjudicated in different chambers; see Section 3.1) as well as chamber-specific caseload, and, therefore, average caseload per judge.

In all of our regressions, we also include the full set of dummies for the year of filing of the case to control for any potential year-specific effects (e.g. new rules, initiatives, and practices) on the duration of case resolution. We base inference on heteroscedasticity-robust standard errors clustered at the case level to account for the dependencies that arise in the expanded data format suitable for survival analysis. Specifically, 939 cases (resolved via settlement or trial judgment or still pending) in our sample give rise to 5,862 distinct observations where an observation is defined as a time interval during which no failure event takes place and, at the same time, there is no change in the value of any of the time-varying covariates. Given the comparatively large size of the sample, we interpret the results as statistically significant only if they are significant at the five percent or lower significance level.

[6] We assessed the validity of this claim by performing tests of independence between judge identity and predetermined party and case characteristics (see Section 4.2) while conditioning on the chamber. We found no systematic deviation from the assumption that cases within a chamber are assigned to judges randomly. Detailed results are available upon request.

5.2. Results: Party and Case Characteristics

The results for both time-invariant party and case characteristics and time-varying case characteristics are presented in Table 4. Columns (1) and (2) show the results for the competing risk events of settlement and trial judgment, respectively. For completeness, column (3) shows the results for the (pooled) risk of case resolution via either settlement or trial judgment. Given the relative abundance of trial judgments in our sample, the results for time to resolution via either settlement or trial judgment largely mimic the results for the time to trial judgment; we thus do not discuss the former results separately.

For many of the party and case characteristics the effect on the time to settlement is different from the effect on the time to trial judgment both in terms of the sign and in magnitude, a finding that directly justifies the use of the competing risks approach. For instance, the presence of multiple parties on either plaintiff or defendant side and the presence of government among the disputing parties, as hypothesized (see Table 3), increases the time to trial judgment. Neither of these party characteristics, however, affect the time to settlement. In contrast, party self-representation increases the time to settlement, but exhibits no statistically significant effect on the time to trial judgment. Completion of the last opening hearing and arrival of the expert report, consistent with our hypotheses, ceteris paribus decrease the time to settlement, but increase the time to trial judgment. In contrast, completion of the last trial hearing, as anticipated, increases the time to settlement, but reduces the time to trial judgment.

Exchange of pleadings has, as expected, no effect on the time to trial judgment. Interestingly, only the initial (i.e. first) exchange of pleadings affects the time to settlement. The estimated effect of the initial exchange of pleadings on the time to settlement, however, is positive and not negative, as the rational-choice theories of litigation that emphasize divergence

of expectations might predict. One potential interpretation of this result, consistent with the behavioral approaches that stress the role of emotions (see, e.g., Kaufmann and Stern 1988, Huang and Wu 1992, Cross 2000, Blumenthal 2005), is that the very intent to exchange pleadings captures the parties' preference to proceed with litigation over settlement; the initial exchange of pleadings may therefore actually increase the time to settlement. Based on this reasoning, the documented lack of an effect of subsequent (i.e. second and further) exchange of pleadings on the time to settlement may then be due to the balancing out of the opposing information revelation and emotions effects. An alternative explanation for the lack of an effect of subsequent pleadings on the time to settlement, consistent with the rational choice view, however, is that it is not the revelation of information per se that matters for the timing of settlement, but rather who reveals the information. Perhaps the disputing parties view the analysis of the court-appointed expert as more credible than the information entailed in the pleadings drafted by the opposing party, and thus only the arrival of the expert opinion, but not the availability of the opposing party's pleadings, reduces the time to settlement.

Finally, some of the covariates exhibit the same effect, or lack thereof, on the time to settlement and on the time to trial. The appointment of an expert and judicial control over the pleadings calendar, as anticipated (see Table 3), increase both the time to settlement and the time to trial judgment. In contrast, the value of the claim and the presence of a legal person among the disputing parties, in contrast to our expectations, in our data affect neither the time to settlement nor the time to trial judgment.

5.3. Results: Judge Characteristics

The results for judge characteristics are presented in Table 5. For each event of interest (settlement, trial, resolution), we report results based on two specifications. The odd-numbered

columns in Table 5 ((1), (3), (5)) show the results when we omit the time-varying case level controls. The even-numbered columns ((2), (4), (6)) show the results when we include the time-varying case level controls. Much like in Section 5.2, we again refrain from separately highlighting the results for case resolution that occurs either via settlement or via trial judgment (columns (5) and (6)).

The results in columns (1) and (2) of Table 5 indicate that judge's gender, age, and experience exhibit no effect on the time to settlement. This finding suggests that the time to settlement is primarily a function of disputing parties' autonomous decisions, and that any judicial involvement plays a lesser role. In particular, our empirical results do not support the frequently made argument that experienced judges may actively facilitate early settlement and thereby reduce court delays (see, e.g., Denlow 2014).

In contrast, judge characteristics matter for the time to trial judgment (columns (3) and (4)). First, we find a robustly statistically significant effect of judge's gender. Based on the specification in either column (3) or (4), time to trial judgment is all else equal shorter for cases adjudicated by female judges than for cases adjudicated by male judges. In fact, when we include the time-varying case level controls (column (4)), the effect of gender becomes even more statistically significant and increases somewhat in magnitude (the magnitude of the time ratio in column (4) is smaller than in column (3), and always smaller than one). This indicates that the effect of a judge's gender does not operate primarily through the timing of those procedural events that we are able to control for in our analysis. One potential explanation for the gender effect on time to trial judgment is that female judges are better than their male peers at managing other procedural steps in the course of litigation that we do not observe in our data, such as for example the postponement of hearings. Another possibility, however, is that our gender variable

is highly correlated with a specific type (rather than length) of judicial experience that we are unable to control for and which reduces the time to trial judgment.

Second, we find evidence that judge's age and experience exhibit an effect on the time to judgment. Specifically, when we omit the time-varying case level controls (column (3)), the effect of judge's age and experience is as hypothesized (see Table 3): all else equal, the time to trial judgment is statistically significantly longer (shorter, respectively) when the adjudicating judge is older (younger) or less (more) experienced. The effect of judge's age and experience on the time to trial judgment, however, becomes statistically insignificant when we include the time-varying case level controls. Because judge's age and experience are positively correlated (correlation coefficient measured at the case level equals 0.74), we also estimated specifications where we omitted one of the two variables while controlling for time-varying case level covariates. The effect of the included variable (age or experience) was still statistically insignificant. Thus, limited independent variation does not explain the documented lack of an effect of judge's age and experience. One explanation for this finding is therefore that judge's age and experience matter, at least in part, by influencing the timing of completion of procedural steps in court adjudication, which in turn affect the time to trial judgment (Table 4, column (2)). It may be, for example, that younger or more experienced judges are able to complete hearings and deliberation earlier than their older or less experienced peers, which in turn reduces the time to trial judgment.

5.4. Alternative Model Specifications

Despite the wide range of explanatory variables and fixed effects that we employ in our analysis, a concern for our analysis may be that our results are in part driven by unobserved heterogeneity. In the specifications in Sections 5.3 and 5.4 we take into account the likely correlation of

observations for a given case by adjusting standard errors to allow for clustering at case level. In this section, we instead explicitly model such case-level unobserved heterogeneity. Thus, we estimate a series of shared frailty models in which the effect of case-level unobserved heterogeneity takes on the form of an inverse Gaussean-distributed (with mean one and variance θ) random effect (see, e.g., Gutierrez 2002, Cleves et al. 2010).

Tables 6 and 7 present the results for shared frailty models using specifications otherwise identical to those presented in Tables 4 and 5, respectively. The likelihood ratio (LR) tests reject the hypothesis that the shared frailty variance (θ) equals zero for eight out of nine specifications at five percent significance level. Thus, there is evidence that case-level unobserved heterogeneity is important. Overall, however, the results in Tables 6 and 7 are both qualitatively and quantitatively very similar to the results reported in Tables 4 and 5. If anything, the results when explicitly modeling case-level unobserved heterogeneity are somewhat more statistically significant than the results when we instead allow for clustering and adjust standard errors. For example, while statistically insignificant in column (2) of Table 4, the effects of party self-representation on reducing the time to judgment and of completion of the first pleading on increasing the time to judgment are now statistically significant (column (2) in Table 6). The comparison of results in Tables 7 and 5 further reveals that explicitly modeling case-level unobserved heterogeneity does not affect any of the conclusions concerning the effect of judge characteristics on the time to settlement and the time to trial judgment, respectively.

6. Conclusion

Contributing to the scarce empirical literature using case-level court data to advance our understanding of the determinants of the time to court case resolution, we examine a novel dataset on civil disputes adjudicated at a major Belgian court. The detailed nature of our data

allows us to examine the role of a wide range of both time-invariant and time-varying features of a case and, importantly, utilize the competing risks approach in order to take into account the generally neglected heterogeneity in the modes of court case disposition.

Our results show that even upon controlling for judge fixed effects, different features of a case, such as the number of disputing parties, their legal form and representation, the completion of hearings and the availability of an expert report, in general exhibit a very different effect on the time to trial judgment versus the time to settlement. Furthermore, exploiting the de facto random administrative assignment of filed cases among the serving judges within the court's chambers, we find that while the time to trial judgment depends on judge's gender, age, and experience, the time to settlement is, in contrast, entirely unaffected by these judge characteristics. Thus, since trials and settlements give rise to different private and public costs (see, e.g., Hadfield 2004, Weinstein 2009, Dimitrova-Grajzl et al. 2014), explicitly modeling heterogeneity in the modes of court case resolution is essential for drawing policy conclusions concerning the time that courts take to dispose cases.

Our within-court research design allows us to focus on the role of a wide range of micro-level features of a case, but at the same time prevents us from examining the role of court-level and economy-wide factors that may also influence the time to court case resolution (see, e.g., Voigt 2016). Given the significant diversity in court organization and legal procedure both within and across different jurisdictions, future work could extend our analysis by examining case-level data collected across multiple jurisdictions and by explicitly modeling the role of associated cross-jurisdictional differences. Finally, while excessive delays in court case resolution necessitate policymakers' attention, for policy-making purposes it is important to keep

in mind that the gains from any reforms aimed at reducing court delays must be carefully weighed against the costs due to a possible decrease in the quality of court outcomes.

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Figure 1: Timing of Settlement, Trial Judgment, and Resolution

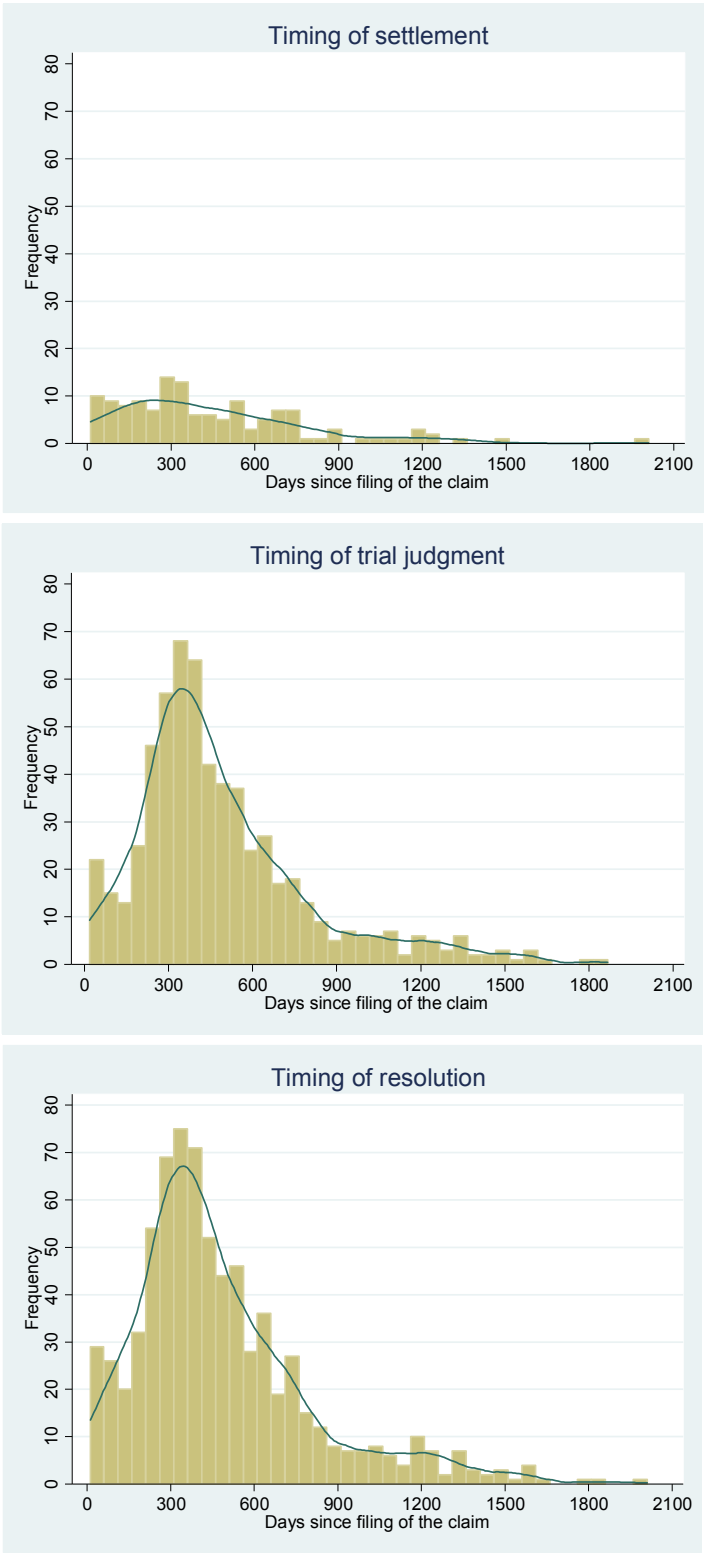

Figure 2: Hazard of Settlement and Trial Judgment

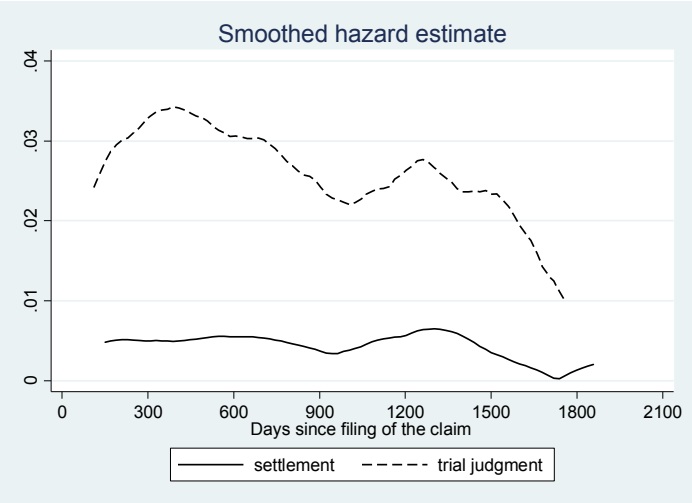

Figure 3: Timing of Last Opening Hearing, Last Hearing, and Expert Report Arrival

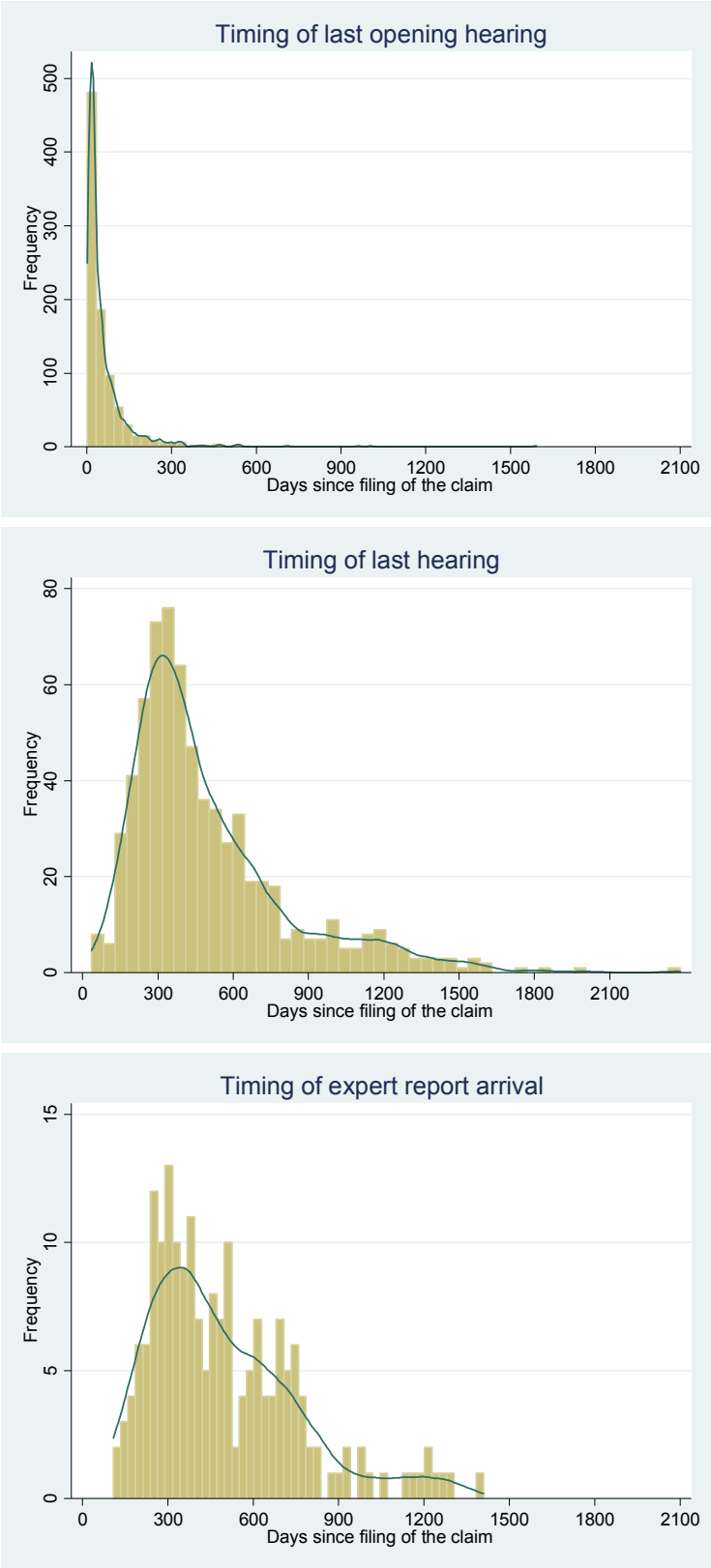

Figure 4: Timing of Pleadings

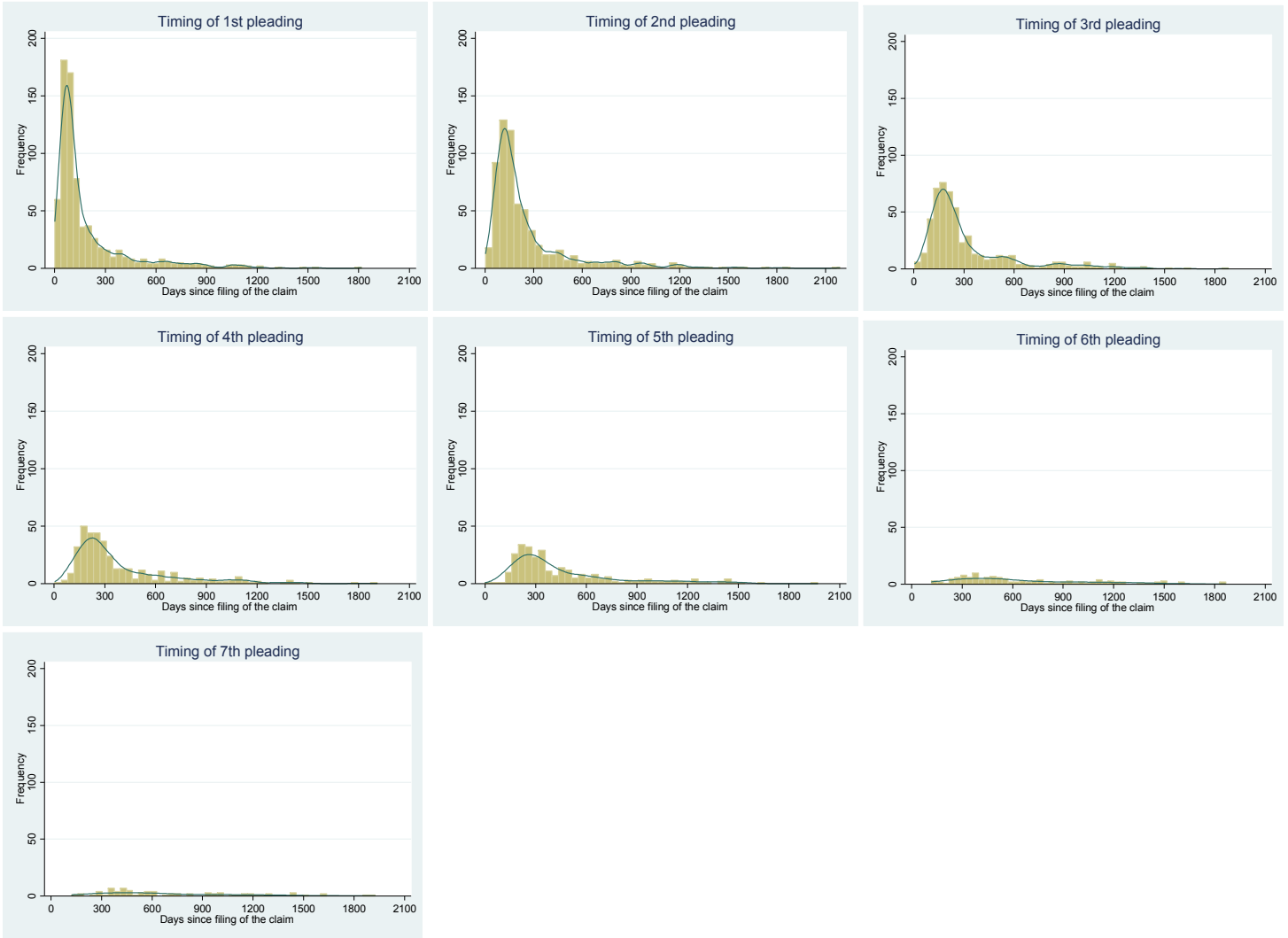

Table 1: Variable Definitions and Description

Variable Name	Description
Case duration	
Time to Settlement	Number of days from filing of the claim to resolution via settlement.
Time to Trial Judgment	Number of days from filing of the claim to resolution via trial judgment.
Time to Resolution	Number of days from filing of the claim to resolution via either settlement or trial judgment.
Time-invariant party and case level	
Multiple Parties	Dummy equal to 1 if there is more than one party on either the plaintiff or the defendant side.
≥1 Legal Person	Dummy equal to 1 if at least one party to the case is a legal person.
≥1 Government	Dummy equal to 1 if at least one party to the case is government.
≥1 Party Self-Represented	Dummy equal to 1 if at least one party to the case is not represented by a lawyer.
Claim Value	Value of the claim, in EUR.
Expert	Dummy equal to 1 if a court expert was assigned to the case.
Pleading Calendar Judge	Dummy equal to 1 if the judge set up the pleading calendar.
Time-varying case level	
Last Opening Hearing	Dummy equal to 1 if last opening hearing has been completed.
Last Hearing	Dummy equal to 1 if last court hearing has been completed.
Expert Report	Dummy equal to 1 if expert report has been turned in.
Pleading *i*	Dummy equal to 1 if *i*-th pleading has been exchanged, $i \in \{1,2,\ldots,7\}$.
Time-invariant judge level	
Female	Dummy equal to 1 if judge is a female.
Age	Judge's age in the year of the filing of the case.
Years of Experience	Judge's years of experience as a judge in the year of the filing of the case.

Table 2: Descriptive Statistics: Case Durations and Time-Invariant Covariates

Variable	No. Obs.	Mean	Std. Dev.	Min.	Max.
Case duration					
Time to Settlement	135	444.8	344.8	11	1997
Time to Trial Judgment	602	494.0	315.9	17	1854
Time to Resolution	737	485.0	321.7	11	1997
Party and case level covariates					
Multiple Parties	939	0.4302	0.4954	0	1
≥1 Individual	939	0.9105	0.2855	0	1
≥1 Legal Person	939	0.8424	0.3646	0	1
≥1 Government	939	0.0149	0.1213	0	1
≥1 Party Self-Represented	939	0.2290	0.4204	0	1
Claim Value (in EUR)	939	31,955.2	146,740.1	200	3,278,249
Expert	939	0.2364	0.4251	0	1
Pleading Calendar Judge	939	0.3546	0.4786	0	1
Judge level covariates					
Female	939 [21]	0.5101 [0.3333]	0.5002 [0.4830]	0 [0]	1 [1]
Age	939 [21]	41.2 [43.9]	8.0 [8.0]	30 [30]	62 [62]
Years of Experience	939 [21]	5.2 [8.4]	4.1 [6.6]	0 [0]	27 [27]

Notes: The numbers in the brackets report descriptive statistics for judge characteristics at the judge level (as opposed to case level).

Table 3: Summary of Hypothesized Effects of Individual Covariates

	Hypothesized effect on time to…	
Explanatory Variables	…settlement	…trial judgment
Time-invariant party and case level		
Multiple Parties	↑	↑
≥1 Legal Person	?	?
≥1 Government	↑	↑
≥1 Party Self-Represented	?	?
Claim Value	?	?
Expert	↑	↑
Pleading Calendar Judge	↑	↑
Time-varying case level		
Last Opening Hearing	↓	↑
Last Hearing	↑	↓
Expert Report	↓	↑
Pleading i=1,…,7	?	0
Time-invariant judge level		
Female	?	?
Age	↑	↑
Years of Experience	↓	↓

Notes: The table summarizes the hypothesized effects of different covariates on the time to settlement and the time to trial judgment based on the discussion in Section 4. ↑ indicates that the covariate is hypothesized to increase the time to a given mode of case resolution. ↓ indicates that the covariate is hypothesized to decrease the time to a given mode of case resolution. ? indicates that the effect of the covariate on the time to a given mode of case resolution is in general ambiguous. 0 indicates that the covariate is expected to exert no effect on the time to a given mode of case resolution.

Table 4: Regression Results, The Role of Case and Party Characteristics

	(1) Settlement		(2) Trial Judgment		(3) Resolution	
Explanatory Variables	Time Ratio	Std. Error	Time Ratio	Std. Error	Time Ratio	Std. Error
Time-invariant party and case level						
Multiple Parties	0.8214	(0.0970)	1.1968*	(0.0877)	1.0563	(0.0622)
≥1 Legal Person	0.9581	(0.1493)	0.9612	(0.0748)	1.0066	(0.0637)
≥1 Government	1.0432	(0.5184)	2.8888*	(1.4433)	2.1715*	(0.8199)
≥1 Party Self-Represented	1.3662*	(0.2174)	0.8441	(0.0762)	0.9957	(0.0785)
Claim Value (in EUR 10,000)	0.9997	(0.0025)	1.0018	(0.0016)	1.0019	(0.0013)
Expert	2.2991***	(0.3810)	3.4326***	(0.3331)	3.0039***	(0.2201)
Pleading Calendar Judge	1.5018***	(0.1788)	1.4478***	(0.0984)	1.4494***	(0.0819)
Time-varying case level						
Last Opening Hearing	0.4045***	(0.0606)	2.3827***	(0.3187)	1.4953***	(0.1468)
Last Hearing	1.9973***	(0.3562)	0.2126***	(0.0182)	0.3255***	(0.0205)
Expert Report	0.5932*	(0.1232)	4.1912***	(1.4168)	1.4937**	(0.2164)
Pleading 1	1.8166***	(0.2639)	1.5044	(0.3176)	2.2228***	(0.2960)
Pleading 2	1.1581	(0.2164)	0.7949	(0.0943)	0.9487	(0.0914)
Pleading 3	1.3405	(0.3256)	0.9705	(0.0839)	1.0248	(0.0723)
Pleading 4	0.9777	(0.2757)	1.0267	(0.0755)	1.0212	(0.0651)
Pleading 5	1.0812	(0.3365)	1.0915	(0.0822)	1.0731	(0.0722)
Pleading 6	0.9179	(0.4617)	1.0164	(0.1032)	1.0998	(0.1038)
Pleading 7	1.3178	(0.6994)	1.1470	(0.1295)	1.1034	(0.1147)
Chamber FE	No		No		No	
Judge FE	Yes		Yes		Yes	
Year of Filing FE	Yes		Yes		Yes	
Observations	5,862		5,862		5,862	
Cases	939		939		939	
Failures	135		602		737	
Censored	804		337		202	
Log pseudolikelihood	-326.94		-292.07		-611.44	
γ	0.4872		0.2995		0.3260	

Notes: The table presents time ratios and their standard errors based on the log-logistic accelerated failure time (AFT) regression models. Competing risk events and pending cases are treated as right-censored observations. Resolution refers to disposition either via settlement or via trial judgment. The omitted category for parties' legal form is all parties are individuals. γ is a parameter of the log-logistic distribution. Reported standard errors are heteroscedasticity-robust and clustered at case level. ***, **, and * indicate significance at the 0.1%, 1% and 5% levels, respectively.

Table 5: Regression Results, The Role of Judge Characteristics

	(1) Settlement		(2) Settlement	
Explanatory Variables	Time Ratio	Std. Error	Time Ratio	Std. Error
Time-invariant judge level				
Female	1.1995	(0.2775)	1.1558	(0.1988)
Age	0.9679	(0.0226)	0.9946	(0.0176)
Years of Experience	0.9951	(0.0290)	0.9866	(0.0221)
Time-invariant party and case level controls	Yes		Yes	
Time-varying case level controls	No		Yes	
Chamber FE	Yes		Yes	
Judge FE	No		No	
Year of Filing FE	Yes		Yes	
Log pseudolikelihood	-423.66		-333.94	
γ	0.6644		0.4900	
	(3) Trial Judgment		(4) Trial Judgment	
Explanatory Variables	Time Ratio	Std. Error	Time Ratio	Std. Error
Time-invariant judge level				
Female	0.8548*	(0.0582)	0.7563**	(0.0735)
Age	1.0181*	(0.0072)	0.9984	(0.0098)
Years of Experience	0.9653***	(0.0089)	0.9766	(0.0142)
Time-invariant party and case level controls	Yes		Yes	
Time-varying case level controls	No		Yes	
Chamber FE	Yes		Yes	
Judge FE	No		No	
Year of Filing FE	Yes		Yes	
Log pseudolikelihood	-774.52		-305.01	
γ	0.3569		0.3028	
	(5) Resolution		(6) Resolution	
Explanatory Variables	Time Ratio	Std. Error	Time Ratio	Std. Error
Time-invariant judge level				
Female	0.8765*	(0.0564)	0.8373*	(0.0655)
Age	1.0019	(0.0070)	0.9940	(0.0079)
Years of Experience	0.9808*	(0.0089)	0.9817	(0.0110)
Time-invariant party and case level controls	Yes		Yes	
Time-varying case level controls	No		Yes	
Chamber FE	Yes		Yes	
Judge FE	No		No	
Year of Filing FE	Yes		Yes	
Log pseudolikelihood	-915.44		-619.84	
γ	0.3757		0.3279	

Notes: The table presents time ratios and their standard errors based on the log-logistic accelerated failure time (AFT) regression models. Competing risk events and pending cases are treated as right-censored observations. Resolution refers to disposition either via settlement or via trial judgment. γ is a parameter of the log-logistic distribution. The number of observations, cases, failures, and censored cases, respectively, for columns (1) and (2) is as reported in column (1) of Table 4; for columns (3) and (4) as in column (2) of Table 4; and for columns (5) and (6) as in column (3) of Table 4. Reported standard errors are heteroscedasticity-robust and clustered at case level. ***, **, and * indicate significance at the 0.1%, 1% and 5% levels, respectively.

Table 6: Regression Results when Modelling Unobserved Heterogeneity,
The Role of Case and Party Characteristics

	(1) Settlement		(2) Trial Judgment		(3) Resolution	
Explanatory Variables	Time Ratio	Std. Error	Time Ratio	Std. Error	Time Ratio	Std. Error
Time-invariant party and case level						
Multiple Parties	0.8415	(0.0940)	1.1566*	(0.0656)	1.0450	(0.0463)
≥1 Legal Person	0.9135	(0.1537)	0.9234	(0.0620)	0.9257	(0.0483)
≥1 Government	1.0464	(0.4648)	2.1917**	(0.5855)	1.6890*	(0.3682)
≥1 Party Self-Represented	1.3482*	(0.1983)	0.8534*	(0.0567)	0.9491	(0.0518)
Claim Value (in EUR 10,000)	0.9998	(0.0046)	1.0018	(0.0015)	1.0018	(0.0014)
Expert	2.3029***	(0.3758)	2.8928***	(0.2278)	2.5793***	(0.1619)
Pleading Calendar Judge	1.5722***	(0.1939)	1.4762***	(0.0861)	1.4698***	(0.0661)
Time-varying case level						
Last Opening Hearing	0.4116***	(0.0562)	1.9386***	(0.1709)	1.0818	(0.0659)
Last Hearing	1.8712***	(0.2834)	0.2479***	(0.0175)	0.3515***	(0.0178)
Expert Report	0.6014**	(0.1170)	3.6471***	(0.9545)	1.5265***	(0.1273)
Pleading 1	1.8444***	(0.2853)	1.8495***	(0.2377)	2.6860***	(0.2218)
Pleading 2	1.1399	(0.2127)	0.8388	(0.0830)	1.0415	(0.0800)
Pleading 3	1.3132	(0.2979)	1.0003	(0.0836)	1.0812	(0.0716)
Pleading 4	1.0026	(0.2707)	1.0525	(0.0925)	1.0614	(0.0733)
Pleading 5	1.0516	(0.3043)	1.0756	(0.0966)	1.0630	(0.0753)
Pleading 6	0.9257	(0.3756)	1.0621	(0.1237)	1.1084	(0.1055)
Pleading 7	1.2928	(0.5786)	1.1369	(0.1465)	1.1463	(0.1213)
Chamber FE	No		No		No	
Judge FE	Yes		Yes		Yes	
Year of Filing FE	Yes		Yes		Yes	
Observations	5,862		5,862		5,862	
Cases	939		939		939	
Failures	135		602		737	
Censored	804		337		202	
Log likelihood	-324.48		-246.69		-523.63	
γ	0.4214		0.2364		0.2150	
LR test of θ=0 (p-value)	0.013		<0.001		<0.001	

Notes: The table presents time ratios and their standard errors based on the log-logistic accelerated failure time (AFT) regression models with inverse-Gaussean shared frailty (with mean 1 and variance equal to θ) specified at the case level. Competing risk events and pending cases are treated as right-censored observations. Resolution refers to disposition either via settlement or via trial judgment. The omitted category for parties' legal form is all parties are individuals. γ is a parameter of the log-logistic distribution. ***, **, and * indicate significance at the 0.1%, 1% and 5% levels, respectively.

Table 7: Regression Results when Modelling Unobserved Heterogeneity, The Role of Judge Characteristics

	(1) Settlement		(2) Settlement	
Explanatory Variables	Time Ratio	Std. Error	Time Ratio	Std. Error
Time-invariant judge level				
Female	1.2097	(0.2631)	1.1293	(0.1868)
Age	0.9664	(0.0202)	0.9930	(0.0160)
Years of Experience	0.9962	(0.0271)	0.9878	(0.0207)
Time-invariant party and case level controls	Yes		Yes	
Time-varying case level controls	No		Yes	
Chamber FE	Yes		Yes	
Judge FE	No		No	
Year of Filing FE	Yes		Yes	
Log likelihood	-423.17		-332.50	
γ	0.5997		0.4388	
LR test of θ=0 (p-value)	0.161		0.045	
	(3) Trial Judgment		(4) Trial Judgment	
Explanatory Variables	Time Ratio	Std. Error	Time Ratio	Std. Error
Time-invariant judge level				
Female	0.8691*	(0.0561)	0.7612**	(0.0622)
Age	1.0153*	(0.0070)	0.9951	(0.0083)
Years of Experience	0.9681***	(0.0089)	0.9782	(0.0114)
Time-invariant party and case level controls	Yes		Yes	
Time-varying case level controls	No		Yes	
Chamber FE	Yes		Yes	
Judge FE	No		No	
Year of Filing FE	Yes		Yes	
Log likelihood	-768.13		-271.62	
γ	0.3125		0.2479	
LR test of θ=0 (p-value)	<0.001		<0.001	
	(5) Resolution		(6) Resolution	
Explanatory Variables	Time Ratio	Std. Error	Time Ratio	Std. Error
Time-invariant judge level				
Female	0.8793*	(0.0571)	0.8362**	(0.0523)
Age	1.0004	(0.0068)	0.9900	(0.0063)
Years of Experience	0.9823	(0.0090)	0.9870	(0.0085)
Time-invariant party and case level controls	Yes		Yes	
Time-varying case level controls	No		Yes	
Chamber FE	Yes		Yes	
Judge FE	No		No	
Year of Filing FE	Yes		Yes	
Log likelihood	-914.03		-538.42	
γ	0.3573		0.2159	
LR test of θ=0 (p-value)	0.046		<0.001	

Notes: The table presents time ratios and their standard errors based on the log-logistic accelerated failure time (AFT) regression models with inverse-Gaussean shared frailty (with mean 1 and variance equal to θ) specified at the case level. Competing risk events and pending cases are treated as right-censored observations. Resolution refers to disposition either via settlement or via trial judgment. γ is a parameter of the log-logistic distribution. The number of observations, cases, failures, and censored cases, respectively, for columns (1) and (2) is as reported in column (1) of Table 4; for columns (3) and (4) as in column (2) of Table 4; and for columns (5) and (6) as in column (3) of Table 4. ***, **, and * indicate significance at the 0.1%, 1% and 5% levels, respectively.