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## **Are Courts Slow? Exposing and Measuring the Invisible Determinants of Case Disposition Time**

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# Are Courts Slow? Exposing and Measuring the Invisible Determinants of Case Disposition Time

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This article analyses civil case disposition time by developing hypotheses to explain behavioral and structural determinants of so-called ‘delay’ and suggesting a novel methodology (‘Echronometrics’) to account for factors, operating at both macro and micro socio-economic levels, that influence the behavior and outputs of civil courts. Our proposed methodology includes more relevant variables, and specifies their interdependence, thus offering a more powerful explanatory tool for future empirical research to account for and measure the complex interactions of time and cost in civil trials.

**P**opular perceptions of “court delay” - reinforced by assumptions widely held amongst litigants, lawyers and researchers – tend to see delay as essentially a failure of the adversarial system or, more specifically, the judges and administrators who manage it. Too often research focuses narrowly on court behavior as the sole cause of delay, and on delay as an unmitigated negative, with the result that much empirical research has become either unduly limited in its scope or potentially misguided in its inquiry. “Delay” is commonly seen as a problem for both parties, which frequently it is not. Attention has focused on the collection and interpretation of limited data sets, with a tight focus on judicial case management, while cyclical variations in the wider economy that connect macro-economic to legal behavior are ignored. Such environmental factors can impact on, if not determine, the overall demand for litigation. Yet most previous studies explain the progress of civil trials with reference to a single jurisdiction and focus on a narrow range of input variables collected over relatively brief periods of time. Even if dictated by circumstance, this narrow focus distorts the reliability and relevance of findings, and fails to explain underlying determinants of court behavior, or phenomena such as vanishing civil trials (Kritzer 2004; Galanter 2004; Dingwall & Cloatre 2006).

This article<sup>1</sup> represents the initial phase of a new access to justice project that builds on earlier efforts by pioneering comparativists (Cappelletti and Garth, 1979). It aims to move researchers and policymakers closer together and toward the creation of a common vocabulary and methodology for the empirical and comparative study of ‘delay’ that complements related research exploring how lawyers and courts may be effectively bypassed. This common framework could guide the gathering and analysis of complex data sets in a uniform and consistent manner that facilitates cross-jurisdictional comparisons and make possible coherent and consistent advice to policymakers. Our approach seeks to identify and explain the subtle interactions of social, cultural and economic determinants that impact on the duration (and cost) of civil litigation, in order that better informed choices may be made about where to invest future law reform effort, assuming civil courts actually prove to be ‘slow’. Without an adequate appreciation of both structural and behavioral contexts, or historic and spatial comparators to assess the relativities, data on levels of consumer satisfaction or judicial workloads (for example), even if collected, will prove difficult if not impossible to analyze and therefore continue to be of limited use to those claiming to improve the speed and efficiency of the justice system.

Finally, we present a novel application of an analytical framework and methodology that refines established statistical approaches in order to isolate factors most likely to make courts more efficient in their processing of legal disputes (Luskin 1978-1979). The “production function” model we propose includes many more relevant variables, and specifies their

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<sup>1</sup> The research was inspired by two philanthropists, Grant and Marilyn Nelson of Christchurch, New Zealand who, having experienced protracted delay in having their case tried, made a generous donation to establish the University of Otago Legal Issues Centre (<http://www.otago.ac.nz/law/research/legalissues/>) Shana Foncesbeck and Rachel Souness provided valuable research assistance in the early stages of the project. The authors are grateful to their audience at the Law and Society Association conference held in Honolulu, Hawai’i in June 2012 where an earlier version was presented and thank, without implicating, the following individuals for helpful comments: Juliet Aiken, David Bamford, Sharyn Roach Anleu, Michael Beenstock, Robert Dingwall, Bert Kritzer, Kathy Mack, and Andy Whitford.

interdependence. In order to differentiate this from more standard approaches applied by previous researchers in the analysis of case disposition time, we label our method “Echronometrics”, in essence a more powerful explanatory tool to account for and measure the complex interactions of time and cost in civil trials. However, this tool is itself dependent on more systematic and accurate data collection. To that end, phase two of our project aims to establish far greater international co-operation between policymakers and researchers to ensure that reliable data is collected, and in a manner that facilitates cross-border comparisons (Shearer 2011: 24-26). Phase two, now under development, will involve collecting and analyzing more comprehensive data sets to test our methodology in a pilot study in South Australia, but linked to research teams based in other jurisdictions.

### **Measuring Delay – Analyzing Existing Methodologies and Results**

Understanding and accurately accounting for the causes and consequences of delay is vital if policy reforms are to promote greater access to justice. Delay threatens the effective operation of the judicial system and can impose additional stress for litigants, victims and witnesses and, in the criminal context, may interfere with the rights of the accused to have the charges against them speedily determined.<sup>2</sup> Any perception of cumbersome court processes may deter citizens with legitimate legal problems from entering and using the system.<sup>3</sup> There is evidence that delay can have broader social implications, with one recent study suggesting a correlation between longer criminal trial duration and a spike in crime rates (Dalla Pellegrina 2008). Finally increases in delay go hand-in-hand with spiraling court costs, with litigation becoming more expensive the more it is extended. These costs are borne not only by individual litigants, but also by taxpayers, who carry the burden of inefficient legal aid

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<sup>2</sup> E.g. New Zealand Bill of Rights Act 1990 No 109, s 23(3).

<sup>3</sup> In 2009 the NZ Attorney-General said defended civil cases in the District Court had halved over the past decade, partly because lawyers were routinely discouraging clients from filing claims due to excessive delay: [http://www.lawsociety.org.nz/publications\\_and\\_submissions/lawtalk/2009\\_issues/lawtalk\\_issue\\_731/firm\\_measures\\_needed\\_on\\_cost\\_of\\_justice](http://www.lawsociety.org.nz/publications_and_submissions/lawtalk/2009_issues/lawtalk_issue_731/firm_measures_needed_on_cost_of_justice)

spending and court administrative costs. This delay-induced cost expansion can distort the meritocratic ideals upon which the legal system is founded. ‘Undue delay’, however defined, leads to increased costs in a way that ‘works for the benefit of the man with the longest purse’ (Storey 1912:4), as it allows the wealthier party to force the opposing party into early settlement or abandonment of legal action altogether (Galanter 1974). Explaining and, where possible, reducing delay is a priority if not precondition for the effective operation of the judicial system and research has a vital role to play in mitigating its negative impacts. But does previous research provide a reliable foundation for current and future policy formation?

### **A Brief Overview of Previous Empirical Studies**

While empirical study of court delay began in the early twentieth century, its evolution has been sporadic and it was not until much later that the first serious study was conducted at the University of Chicago (Zeisel 1959; Kritzer 2009: 928). A notable surge emerged in the 1970s and 1980s as a result of work led by Church’s *Justice Delayed – The Pace of Litigation in Urban Trial Courts*, and subsequent follow-up studies by the National Centre for State Courts. This coincided with the emergence, in many jurisdictions, of case management reforms. Despite major systemic changes in most jurisdictions over the last decade, there have been remarkably few empirical studies of delay since 2000.<sup>4</sup> Court reform is not, it would seem, driven or informed by empirical research. For example, Goerdt’s follow-up review of court performance in the 21 jurisdictions examined in Church’s study, eight courts had increased their median disposition time by 20 percent or more in the following decade, and another five increased their median disposition time by 40 percent or more (Goerdt 1991). As Goerdt observes, (1991:29), ‘these findings are somewhat discouraging’ given the

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<sup>4</sup> Empirical studies tend to focus on particular types of cases, such as capital appeals in the U.S.: Cauthen & Latzer 2008; or specialized courts: Butts et al. 2009. Ongoing work by the National Center for State Courts is an exception.

years of research and education of judges regarding the nature of delay in litigation and effective case management.’

The existing body of delay research has produced inconsistent and disparate findings (Church 1982; Garner 1987)<sup>5</sup> and is the product of divergent research methods, different ways of characterizing the subject-issue and a lack of consistent co-ordinate terms. For example, Garner (1987) noted that three studies analyzing a single court delay reduction program reported “different numbers of cases, [used] different measures for ostensibly the same concept, and [generated] different conclusions about the causes of court delay.” As Garner concluded, “there can be little surprise at the lack of unanimity across the disciplines, institutions, and jurisdictions” given the disagreement among close colleagues (Garner 1987). A useful illustration of these divergent approaches has been the way different studies have focused on ‘delay’ with respect to various aspects of the duration of the dispute. While *Justice Delayed* and many of its contemporary and subsequent studies evaluated the duration of litigation from inception to judgment (Church 1978; Luskin 1978-79; Goerdts 1991), it has not been uncommon for studies to take a narrower approach and specifically examine trial length,<sup>6</sup> or a particular stages of civil litigation (Grossman 1981; Cranston 1985). At least one study examined the amount of time it takes for a civil litigant to recognize their problem as a legal complaint and initiate suit (Cranston 1985).

These different foci produce divergent approaches for data collection and analysis as well as divergent results - a short trial may require a long pre-trial stage, while getting before a judge quickly may slow down the later progression of matter. Even where consensus on the type of data needed exists, different methodological approaches for collecting it remain. Five

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<sup>5</sup> In his critique of more than a dozen criminal empirical studies from the 1970s and 1980s, Garner found that the defendant’s bail status was the only variable consistently correlated to disposition time.

<sup>6</sup> Some studies look at the total number of sitting days: Chan & Barnes 1995; Corns 1997, or the number of hours and minutes devoted to sitting time: Sipes 1988.

principal methods have been used to gather and analyze data on delay, each having distinct qualities, but too often empirical study has relied upon just one approach and without using context to correct for weaknesses. The *pros* and *cons* of each data gathering method need to be understood before developing a more comprehensive approach:

Most empirical research into delay has sought to deploy quantitative research methods that utilize existing data sets. Researchers commonly seek to minimize temporal and financial costs by drawing upon available court statistics to examine delay (Church 1982; Heise 1999-2000; Weatherburn and Baker 2000). While this may have certain efficiency and resourcing advantages, the standards of data collection vary considerably according to administrative staff budgets, resources and training, not to mention an inherent predilection amongst all organizations not to keep accurate records (Bittner & Garfinkel 1967). The result often is inaccurate data (see Chan & Barnes 1995; Sipes 1988), which has led researchers, such as Sipes, to adopt the unusual approach of gathering contemporaneously recorded ongoing trial data.<sup>7</sup> Greater reliability, and more detailed and tailored data are to be weighed against the logistical and cost implications that limit such collection. And as Sipes notes, accuracy may still be undermined by factors such as judges choosing not to participate or forgetting to include relevant data (Sipes 1988). More significantly, active data collection may reveal relevant factors invisible on the court record, including the impact of judicial attitudes and behaviors (see Boyum 1979-1980). The relative convenience and ease of access to official court records makes quantitative approaches the norm but the content of court records often dictates the variables analyzed in the resultant modeling, as relevant information (for example, the type of case, charge, and judge) is more readily available.<sup>8</sup> While more tailored

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<sup>7</sup> Sipes reported that plans to collect data from trial transcripts were abandoned upon realising “the transcripts were not complete, and that estimates of trial length based on the transcripts would contain much error”: Sipes 1988.

<sup>8</sup> It should be noted that other measurable variables, such as the use of technology or the number of witnesses, may or may not be recorded, depending on jurisdictional requirements.

case-specific variables may be desirable for providing a more nuanced understanding of the causes of delay, not only can it be difficult to identify appropriate variables,<sup>9</sup> but gathering data on such variables will inevitably raise logistical difficulties.

The ability of qualitative research to capture more “human” elements that contribute to delay allows it to supplement the ‘hard’ data of quantitative research. While this can be labor intensive the risk is that it is too anecdotal and subjective, revealing entrenched views that may distort conduct. For example, in Church’s 1979 study, lawyers and judges in the slowest jurisdiction took for granted that cases simply could not move any faster. There are compensating advantages, including direct exposure to personal experience. However, the problem remains of having non-randomized, and therefore biased, samples that in turn lead to biased statistical inference.

Another common approach is the use of case studies to focus intensely on a small sub-set, such as unusually long trials, allowing greater nuance in analysis in a more manageable logistical undertaking. For example, Chan & Barnes (1995) analyzed 67 “very long” criminal trials over a two-year period in Australia, collecting concrete data and interviewing key participants. In a similar Australian study, Corns (1997) identified five very long criminal cases to be analyzed in great detail, including transcripts and judgments analysis, interview, and statistical analysis of trial time. While these studies provide excellent detail of the chosen subset, it is often difficult to extract more general underlying factors influencing delay.<sup>10</sup> Furthermore, questions remain about how representative the chosen cases are and whether general conclusions can be supported or have, in statistical terms, external validity.

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<sup>9</sup> Chan & Barnes took a novel approach in developing their variables by distributing a preliminary questionnaire to representatives from police, courts, and prosecutorial agencies, asking their opinions about what factors influence trial length, and the responses to these questionnaires helped form their list of variables: Chan & Barnes 1995

<sup>10</sup> Chan & Barnes note that the original intent of their study was to compare the characteristics of long and short trials, which would have offered more insight into the factors associated with trial length, but that costs and logistical complications required them to narrow the scope of the study: Chan & Barnes 1995: 21



Data contained in reported cases may also be used. While limited by the small set of cases for which the subject-matter of the case provides data on duration, the approach can be powerful and efficient. Calvez's study examining delay by reference to judgments of the European Court of Human Rights concerning allegations of 'unreasonable delay' illustrates this (Calvez 2007).<sup>11</sup> She drew conclusions about the court's criteria for addressing delay, by providing detailed analyses of case histories. While this could have wider application,<sup>12</sup> it can only ever provide a snapshot of the causes of delay, constrained as it is by the limited causes of actions and the choices of individual litigants.

Other researchers have undertaken comparative analysis to consider discrete data sets either across time or a number of jurisdictions.<sup>13</sup> This involves comparing case processing times in similarly-sized courts within a single country (Church 1978; Luskin and Luskin 1987; Sipes 1988) or, alternatively, comparing case-processing time in one particular court system over a period of years (Selvin & Ebener 1984; Garner 1987; Sutton & Barwick 2000). While intuitively attractive as a means of isolating factors that may influence delay, the process can be difficult not only because procedures may differ for similar types of cases, but because the type and consistency of data collection varies between courts. Hypothetical disputes may circumvent the problem, for example, one 2003 study examined delay by evaluating the processes for a basic dispute by submitting a questionnaire to cooperating law firms in 109 countries asking how a hypothetical dispute would be handled (Djankov 2003).<sup>14</sup> This can

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<sup>11</sup> Calvez examined judgments and other materials regarding cases brought alleging a violation of Article 6(1) of the European Convention on Human Rights which guarantees civil litigants and criminal defendants the right to a hearing "within a reasonable time".

<sup>12</sup> This approach could, for example, lend itself to a review of appellate decisions in other jurisdictions with similar provisions regarding the right to a speedy trial.

<sup>13</sup> Examples of this approach include the work of Mafording and Eyland (2010), who have compared court processing times between Australia and Germany, while Dakolias (1999) has collected data on court performance across eleven countries, reporting data on case loads, cases resolved or pending, the number of judges, and the average time to resolve a case.

<sup>14</sup> See also approach adopted by the World Bank in conducting its 'Doing Business' Reports: World Bank (2010)

partially equalize otherwise inconsistent variables, yet remains limited by its dependency on the accuracy of its respondents. Comparative research frequently overlooks cultural variables that influence the operation of legal systems, as seen in social and ethnographic research on delay in the Italian and Maltese legal systems (Nelken, 2004; Zammit, 2011). As Nelken notes, “Legal delay in Italy should...be treated not just as an indicator of waiting times but also as a measure of the distance between legal culture and general culture (Nelken, 2004: 25).

### **Understanding the Scope and Nature of Delay**

That courts are riddled with unreasonable and detrimental delay is something rarely questioned by the public, lawyers or policymakers. Delay is expected. The old adage “justice delayed is justice denied” has been a stick wielded against legal systems at least since clause 40 of Magna Carta proclaimed: ‘To no one will we sell, to no one will we refuse or delay, right or justice.’ Over a century ago, Pound (1906: 24-25) optimistically looked forward to when ‘...our courts will be swift and certain agents of justice’ while Storey (1912: 21-2) argued that of ‘the real evils which beset the administration of justice ... first among them is “the law’s delay”’.<sup>15</sup> Such concerns continue to preoccupy the public imagination as seen in a 2009 survey in New Zealand showing that only 23% of respondents believed a case would be completed “within a reasonable amount of time” if they went to court, a finding mirrored in other jurisdictions. For example, a 1999 survey of Americans showed that 78 percent agreed with the statement, “It takes too long for courts to do their jobs” (ABA 1998-1999).

Part of the problem is defining the concept of ‘delay’: how long should it take to resolve a dispute in court? Indeed, the assumption that there is as an *objective, proper* or *ideal* length of

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<sup>15</sup> Pound cites Bentham complaining that 543 out of 550 writs of error ‘...were shams or vexatious contrivances for delay’ (*Works, VII*, (1797) 214) while Storey observed that ‘delay’ is ‘an evil which has been the cause of bitter complaint ever since legal tribunals came into being.’

time to resolve a dispute ignores anthropological insights and appears naive. A dispute is a dynamic unpredictable human phenomenon that can travel in numerous directions: through legal proceedings apparently complex cases will crystallize into simple disputes, while simple straightforward claims over small sums can explode in legal complexity (Economides, 1980). Moreover, party interests and objectives may change, and the appetite for confrontation may itself wax or wane. ‘Delay’, not unlike the concept of ‘unmet legal need’ (cf Marks 1976; Lewis 1973), is best seen as a highly subjective and normative product of stakeholders in the justice system.

The advantages that delay offers, for parties and institutions, in deferring decisions are often overlooked. Litigants view delay differently: a party seeking to alter the legal status quo – a plaintiff chasing a debt, or seeking compensation – may desire rapid resolution, while a party resisting the claim – a defendant seeking to retain title, or a parent wishing to retain custody of their child, or the accused hoping to avoid prison – may all actively seek procrastination that maintains current conditions (Genn 2010: 111). While one party may express frustration at the other’s ‘delay tactics’ – voluminous discovery requests, interlocutory applications, and other time-consuming legal maneuvers – another party may defend such tactics as appropriate zealous representation. Delay may also be entirely justifiable, even desirable, within an adversarial system. As Storey notes (1912: 26), ‘... delay is extremely useful.’ Factually or legally complex cases demand more extensive preparation and deliberation than simple cases, and inevitably absorb more time. However, some sources of delay are more suspect: ill-prepared lawyers seeking unnecessary adjournments; overloaded court facilities that are overbooked, causing postponed trials; defendants with hopeless cases striving improperly to fend off the inevitable. To combat such tactics we favor a much broader notion of the ‘duty to the court’. For example in Victoria, Australia legal practitioners and all parties – including those involved in satellite litigation, insurers and third party litigation funders –have

‘overarching obligations’ to the court which take the form of “10 commandments”, e.g. “To use reasonable endeavors in connection with the civil proceeding to – act promptly; and minimize delay”.<sup>16</sup>

Some researchers favor rejecting the term “delay” altogether, arguing that more neutral terms such as “timeliness”, “case processing time” or “pace” better reflect the standard to be measured (Luskin 1978-1979; Grossman 1981). While ‘delay’ can be ambiguous, little is gained by rejecting it entirely. As with the elephant difficult to define in the abstract, delay *does* have a clear core meaning and, in our view, should be retained.

As with the concept of ‘need’, the concept of ‘delay’ has an inherent subjective and value-laden dimension making it hard to measure empirically. We therefore prefer to focus on the more measurable notion of ‘duration’ of civil proceedings, and seek to identify the range and impact of factors that influence case progression. These factors include those falling within a traditional ‘narrow’ conception of delay – the obstructive litigant, underfunded courts or poor case management. But they also include more acceptable factors that can slow down proceedings such as a beneficial pause to let tempers cool or extended time to prepare properly a complex case, not to mention other relevant factors, such as broader economic social and cultural context and practice, or the substance of the dispute. Through focusing on the identification and impact of factors that influence the duration of proceedings, subsequent analysis and evaluation can be better targeted to produce more meaningful reform.

By introducing context and taking account of disputants’ experiences from the inception of a grievance through to enforcement of judgment one can locate court delay in the overall dispute process (Dingwall and Durkin 1995:372), and to see whether case progression time

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<sup>16</sup> See ss 10-26 Civil Procedure Act 2010 (Vic); see also Civil Justice Review, Report 14, Victorian Law Reform Commission (2008) ch.3 available at: <http://www.lawreform.vic.gov.au/projects/civil-justice/civil-justice-review-report>

has an overall neutral, or adverse, impact on total dispute duration. This total duration will be of more significance to disputants.<sup>17</sup> Moreover, narrow conceptions of delay can blinker reforms in a manner that perversely ‘aggravate rather than alleviate the related problems of cost and accessibility’ (Dingwall and Durkin 1995:372). Our preferred approach incorporates important *external* factors and constraints connected with what may be happening in the local or macro economy, in addition to factors *internal* to the civil justice system (including the organizational context of time management by courts, litigation strategy by the parties (Martin and Maron 1994; Durkin 2001), and consequences of client management (Dingwall *et al.* 2000).<sup>18</sup>

This broader behavioral focus on case or dispute – rather than just trial – duration may increase both cost and complexity in data collection, potentially compounding the current problem of maintaining adequate records regarding trial duration, not a high priority for many civil court administrative systems. Researchers frequently note their dependency on haphazard and unreliable record keeping (Chan & Barnes 1995; Sutton & Barwick 2000) and the risk is that gathering more extensive data could exacerbate this problem, unless court officials are prepared to invest in better data collection and storage. While a more expansive conception of delay allows for a more nuanced interpretation of data, it should provide a more reliable guide for future reform. It therefore becomes ever more pressing that reforms are supported by clear, precise and comprehensive empirical evidence, as opposed to speculation (Garth 1997; Heise 1999-2000: 813).

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<sup>17</sup> As Dingwall and Durkin observe (1995:372), what matters to the parties is not the time spent processing the case through a particular stage of legal proceedings, but the ‘duration from a plaintiff first seeking legal advice to the resolution of the case.’

<sup>18</sup> We thank Robert Dingwall for pointing out how a case-processing system may be front or back-loaded, and how lawyers may slow down a case until a late point in the limitation period in order to see whether a client’s condition deteriorates thereby increasing the value of their claim. Similarly, in medical negligence cases, slowing down might be caused by lawyers trying to get their client’s expectations of a settlement down to more realistic levels.

## **Factors Influencing Case Duration: Hypotheses**

Previous studies on court processing time overlook the external environmental context of litigation favoring instead factors internal to court administration. We therefore propose a more comprehensive set of hypotheses to explain the full range of factors likely to influence, if not cause, court delay.

### ***Judicial Structures and Resourcing***

Judicial resources may not be quite as significant as first appears. Although it seems intuitive that increasing numbers of judges and courtrooms inevitably produces faster case processing (Zeisel 1959), research by Church (1982) suggests otherwise and judicial shortages need not impact on delay. Relevant factors may include:

***The Number of Judges:*** The availability and allocation of human (judicial) resources may affect the capacity of courts to process disputes. The most obvious of these is the number of judges available to resolve disputes relative to the number of cases (caseload per judge). The correlation between judicial caseload and case duration need be neither direct nor linear. Indeed, some research indicates an inverse relationship between the number of judges and judicial productivity (Beenstock 2001; Beenstock and Haitovsky 2004). However, any drop in individual productivity may be compensated by systemic gains in output.

***The Availability of Courtrooms:*** A trial can progress only if courtrooms are available to hear the matter. Anecdotal evidence suggests that timetabling and shortages of courtrooms can cause substantial delays.<sup>19</sup> While increasing investment in court infrastructure - the number of court buildings or court rooms within buildings and support staff – should produce efficiency this will not automatically be the result, though

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<sup>19</sup> Often the remedial measures required to deal with this problem, such as ‘double-booking’ courtrooms in the hope that one case may settle or be adjourned, will themselves create ongoing complications and delay.

it does seem probable that where infrastructure falls below a certain threshold a detrimental impact on case duration will occur.

***Allocation of Judicial Resources:*** The allocation of judicial resources *within* the judicial system may impact upon case duration. For example, the number of courtrooms may be less important than the geographic distribution of courthouses to ensure that they are located in regional or rural centers with a sufficiently high caseload density (Calvez 2006). Similarly, a heavy concentration of judicial resources on criminal cases may reduce or even displace resources available for civil litigation. For this reason, geographic research using location-allocation models has been used to determine the optimum sites for court buildings (Thomas, Robson and Nutter 1979).

***General Court Infrastructure:*** The effectiveness with which judicial resources can be deployed to quickly resolve disputes may depend upon more general court infrastructure (Mafording and Eyland 2010), including the availability of sufficient numbers of well-trained support and administrative staff.<sup>20</sup> Similarly, the availability and utilization of well-resourced IT systems may increase judicial productivity by allowing faster research and judgment production. Further, the availability and utilization of technological innovations, including video-conferencing and electronic submissions, may expedite trials. Conversely, such innovations may, through technical failures, actually increase trial length.

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<sup>20</sup> Anecdotal evidence suggests staff training, turnover, and job satisfaction can have a major impact on court efficiency. Short-term strikes by court staff in NZ during 2009 shut down court operations and temporarily paralysed the country's courtroom operations. The after-effects of the Canterbury earthquakes also had an effect displacing litigation elsewhere, as well as on court buildings throughout the South Island, six of which were deemed unsafe following safety inspections: <http://www.stuff.co.nz/national/6073112/Quake-risk-could-close-public-buildings>

### ***Organizational Structures***

A second broad category of factors that can influence case duration concerns institutional practices (both judicial and administrative) of the court. These practices control the way in which court structures are organized, cases are managed, and the time of judges utilized. Given that such practices present an opportunity to affect visible (if not effective) change, they are commonly the focus of reform initiatives. Unfortunately such reforms are rarely based on sound empirical findings, nor are they commonly subsequently studied to assess their impact. While the impact of these practices seems to have been overplayed, there remains clear potential for these institutional practices to impact upon the duration of cases. Such factors include:

***Case-Management methodology.*** The rapid and expanding adoption of judicial case-management techniques over the last thirty years has largely been justified in terms of reducing delay. While the impact of these reforms on duration, cost and quality of resolution remain under-researched, the clear potential for such impact makes this an important factor to analyze.

***Alternative Resolution Methods:*** A closely related reform in the common law world has been the rapid expansion, particularly since the 1980's, of ADR mechanisms. Increasingly, courts have, in the interests of more quickly resolving disputes, actively engaged with these alternative mechanisms either by sanctioning or mandating parallel alternative dispute resolution. The availability and utilization of such mechanisms may lessen judicial workload and the demand for formal adjudication in court, though again the impact on case duration is not always clear. For example, a mandatory mediation that fails may act only to increase the cost and duration of the dispute.



***Decision-Making Requirements:*** The use of multi-judge benches where there is a willingness to utilize joint judgments may reduce duration by allowing judicial resources to be more effectively utilized. Similarly, the willingness of judges to deliver *ex tempore* decisions, rather than reserving judgment to provide written opinions, can affect the duration.

***Judicial Specialization:*** The use of specialized courts and judges as well as workload allocation practices can impact upon duration. The creation of specialist ‘streams’ allows judicial expertise to increase speed, volume and efficacy of dispute resolution, for example, divorce litigation is fastest where judges primarily handle contested divorce trials, leaving other work to quasi-judicial staff (Goerd 1992).

***Judicial Training and Competence:*** The age and experience of the judge can also be a factor, with more experienced, competent, or better-trained judges able to reach decisions more speedily. Judicial independence and accountability may cause controversy.

***Extra-Curial Judicial Activities:*** The way in which judges manage time and work-life balance is likely to have an impact on the duration of cases. For example, at least one European study noted delay caused by judges’ participation in extra-judicial activities such as crime prevention advisory committees (Calvez 2006).

### ***Court attitudes and behavior***

Another broad category of factors influencing case length, within an overall culture of adversarialism, concerns embedded attitudes and behaviors amongst judges, lawyers, litigants and defendants. Church, for example, argues that a trial court’s speed in processing cases and its backlog of unresolved cases is determined in large part by “local legal culture,” which he described as “the established expectations, practices, and informal rules and behavior of

judges and lawyers” (Church 1978:54; Blacksell *et al.* 1991: 12-13). Although this concept of ‘local legal culture’ has been criticized as uninformative and vague (Grossman 1981), subsequent studies consistently attribute some degree of delay to individual and collective behaviors. This culture is developed over time by lawyers, judges and court officials through such means as listing practices, the degree of flexibility that can be tolerated when meeting and honoring deadlines, and participants’ (including judicial, lawyer and litigant) expectations of what is fair and reasonable.

***Judicial Behavior:*** Empirical research shows how dominant judicial culture impacts on both the behavior and conduct of judges, and the length of proceedings (Sipes 1988:53-54). The degree of managerial and legal competence of judges involved in the conduct of a trial can reflect several factors, including: length of service, geographical location, specialist knowledge of relevant legal fields, broad judicial culture and collegiality, and administrative aptitude or familiarity with the context of the dispute that forms the background to the trial.

***Lawyer Behavior:*** Sipes’ research noted that most judges interviewed agreed that trial length varied, at least somewhat, by lawyer preparation, knowledge, and skill (Sipes 1988:57). Another key factor that can lengthen or shorten trials is lawyer behavior and tactics. Lawyers both influence and respond to external social and economic forces, with considerations of the local legal culture and personal incentives mechanisms influencing choices lawyers make, thereby affecting case processing time. And interestingly, law school culture may be a contributory factor in lawyer procrastination (Acorn and Buttuls, 2013).

***Litigant Behavior:*** Finally, the behavior of the litigants may impact on case duration. Although delay typically poses a costly burden on those involved in litigation, delay

tactics may be strategically employed, as when a deep-pocketed corporate defendant prolongs discovery, hoping to financially overwhelm and intimidate a smaller opponent into settling by “burying them in paper.” A criminal defendant who is free on bail may have little incentive to get to a speedy trial.<sup>21</sup> Who the parties are will also be relevant: children and vulnerable witnesses may take up greater time and resources, while classifying the parties as a ‘repeat player’ or ‘one-shotter’ makes a difference in terms of how well they can play the system (Galanter 1974).

### ***Dispute and Legal Complexity***

Factual or legal complexity is likely to impact on duration of disputes coming to court. Much litigation is reactive in nature and lower courts cannot easily control the complexity of the cases coming before them. Nevertheless, courts can respond in an efficient and proactive manner. Many jurisdictions recognize the delay-inducing complications inherent in complex civil cases, and seek to address these problems by adopting differential case management techniques.<sup>22</sup> Furthermore, courts are both dispute-resolvers and norm-creators, with judicial decisions of superior courts altering the legal landscape in a way that can actively reduce legal complexity. Combined with the regulatory power of courts to set and alter Rules of Court, various measures to reduce complexity and delay may be adopted, including:

***Legal Complexity:*** The content and clarity of the substantive law itself can play a crucial role in determining the length of trials. The degree of legal complexity will reflect the complexity of relevant legislation and case-law: ambiguous rules may prolong litigation while clear legal rules may promote settlement. Moreover the legal complexity of the case may reflect the nature and number of legal issues raised by the parties. Some

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<sup>21</sup> Existing research supports this supposition, showing that criminal cases progress more quickly when the defendant is not free on bail: Luskin & Luskin 1987

<sup>22</sup> While case management techniques offer a common-sense approach to managing case complexity, more research is needed on the effectiveness of case management: Steelman 1997.

research has identified a positive correlation between the number of charges a defendant faces and the length of a case (Sipes 1988; Luskin & Luskin 1987; Chan & Barnes 1995), though the literature is more mixed about whether the seriousness of a crime charged (the type of crime) or the type of civil case play a major factor in the speed of case processing (Garner 1987; Church 1978). While it may be hard to measure, legal complexity clearly remains a critical factor affecting duration.

***Factual Complexity:*** Factors here include: the number of witnesses, number of exhibits, and the use of expert witnesses (Sipes 1988; Luskin & Luskin 1987; Chan 1995; Corns 1997). Such factual complexity is likely to impact upon duration both because of the logistical complications involved, and because of the sheer time involved in processing and presenting such material.

***Technical Complexity:*** This concerns the procedural and evidential norms that govern the conduct of the proceedings generally and the trial specifically, including the number of witnesses, expert witnesses and exhibits. All of these factors have potential bearing on how long the court takes to reach a decision.

### ***Environmental Factors***

Environmental factors may fall outside the control of the courts, yet still determine what happens inside them. The assessment of these factors in most empirical research is at best underdeveloped and in most cases absent. These ‘environmental’ or ‘macro and micro socioeconomic’ issues would seem to have a significant indirect impact upon litigant behavior, and therefore potentially contribute to delay. Such factors include:

***Human Factors:*** The health/illness of participants, demographic considerations, and ethnic and cultural factors are likely to affect proceeding duration. For example,

language barriers may exist in areas with a large portion of individuals whose mother tongue is not the same as the language used in courts. Similarly, different ethnic groups may have different attitudes towards the law and use courts more or less frequently as a dispute settlement mechanism. The way in which a system responds to ‘delay’ caused by such considerations will have a profound effect on the way in which the final resolution is received by the participants. Such factors may slow down proceedings, yet managed well they have the potential to lead to more effective resolutions. While it may be difficult to gather personal information about the circumstances of participants, there would seem to be a causal link with the duration of proceedings.

***Natural Factors:*** The duration of cases may also be influenced by ‘natural’ factors, such as floods, fires or earthquakes, that can disrupt and delay proceedings, and can even lead to a large increase in the number of cases. Though such factors are likely to be rare, their disruptive effect can be significant. However, the ‘one-off’ nature of such events means that while they should be noted by researchers, they are unlikely to aid in identifying undue delay.

***Socio-Economic Factors:*** Finally, broad ‘economic’ factors external to the legal system can affect the volume, duration and kind of case coming to court. Factors such as global, regional and national levels of commercial activity at a time of boom, or bankruptcy proceedings, employment disputes and debt collection at a time of recession, may impact on both the propensity to sue and the capacity of courts to process legal claims. There is empirical evidence that suggests a degree of inter-relatedness between economic development of a country and the operation of the legal system (Aldashev 2009; Messick 1999), though it is unclear what the precise causal

relationship is (Klick 2010).<sup>23</sup> These economic factors should also account for sub-national regional differences in the socio-economic structure. It is likely that higher national or regional income levels may indicate more resources available in society that can be used for engaging in legal disputes. Along similar lines, the health and social expenditures in a geographic area where a court is located are likely to affect the demand for legal services overall but also the type of legal service used.<sup>24</sup>

## **Developing a Comprehensive Methodology**

### **Transcending Descriptive Statistical Measures**

Most previous quantitative analyses of the duration of litigation compiled extensive lists of factors (variables) that were compared pair-wise in order to shed light on what possibly explains differences in delay. For example, Sipes *et al.* (1988) examine median trial times in hours and minutes by type of trial, by case type and various case and community characteristics, and by court. Similarly, Levin (1975) reports percentages for case characteristics in relation to median delays. Marfording and Eyland (2010) use descriptive statistics such as the mean, median, standard deviation and percentages for measures of court and case characteristics. More recently, Righarts and Henaghan (2011) examine the median number of days from filing to resolution for courts within a set time period.

This use of relatively simple descriptive statistics can illustrate how issues behave relative to each other in bi-variate relationships, and can be particularly effective at identifying broad trends in behavior and providing baseline information. This approach is not, however, well suited for establishing causation. Apparent causal relationships that may appear when factors

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<sup>23</sup> Klick argues that causality may run both ways, from the characteristics of the legal system to economic growth and *vice versa*.

<sup>24</sup> See also the 2013 OECD report 'Judicial Performance and its Determinants: A Cross-Country Perspective,' <http://www.oecd.org/eco/growth/FINAL%20Civil%20Justice%20Policy%20Paper.pdf>

are taken in isolation can vanish once one controls for other influences: too often an apparent pair-wise relationship may be statistically spurious as the true driving force is some other factor. Correlation does not imply causality.<sup>25</sup> The following hypothetical example illustrates the point. A court introduces electronic technology for handling all court documents (both civil and criminal) along with video-conferencing for expert witnesses, leading to a substantial reduction in court costs. At the same time that jurisdiction sees (an unrelated) doubling of the caseload of criminal proceedings. The court chooses to use the cost savings to deal with the increase in criminal cases and, given the relative increase in workload, prioritizes the scheduling of criminal cases over civil cases. In such circumstances, an observer may incorrectly conclude, from looking at civil cases in isolation, that the introduction of new technologies *prolongs* the time from filing a civil case to its disposal. Effective analysis must control for all major influences that may affect duration if it is to accurately assess the relative importance of each factor. This cannot be achieved in a pair-wise comparison with descriptive statistics. Instead, what is required is a form of multiple-factor analysis that allows for the correction of these otherwise unseen effects. A popular solution to this problem is to use regression techniques that can handle multiple and complex variables.

***Establishing Causation for Civil Case Disposition Time: Analysis with Regression Methods***

Regression analysis is an established statistical technique for estimating the relationships between variables by providing a method to model observed data in order to understand those relationships.<sup>26</sup> A statistical regression model relates the variable that is to be explained – the dependent variable (or explained variable)<sup>27</sup> – to one or more independent variables (or

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<sup>25</sup> A basic statistical explanation is provided, see Stewart 2005:102-109.

<sup>26</sup> Basic regression analysis is explained in econometrics textbooks, eg Stewart (2005), Stock and Watson (2007) and Wooldridge (2009).

<sup>27</sup> Alternative terminology used in basic regression analysis is explained in Wooldridge (2009:23).

factors).<sup>28</sup> A ‘dependent variable’ in a causal model is a variable that is explained by other factors in the system, so that a ‘dependent variable’ will be a mathematical function of ‘independent variables’. In a simple linear system, identifying the relationship between a single independent variable and a single dependent variable is straightforward. However, where a system consists of multiple factors a more sophisticated technique is required. By using regression analysis the relationship between an independent variable and the movement of one dependent variable is explored while other influences (other independent variables) are controlled for. The power of regression analysis arises from the fact that the dependent variable is ‘regressed’ on all independent variables simultaneously. Within this framework it is possible, therefore, to talk about causation in a way that is not possible in instances of bi-variate analysis.<sup>29</sup> Our proposed approach for studying ‘delay’ utilizes regression analysis to explore the impact of various factors on the duration of civil proceedings.

The weaknesses of bi-variate analysis already has been seen in this context (Luskin 1978-1979), with several researchers using regression analysis to examine court processing time (e.g. Landes 1971, Gillespie 1976, Luskin and Luskin 1987, Chan and Barnes 1995, Heise 1999-2000 and Sutton 2001). For example, Heise (1999-2000) uses regression analysis to explore which factors significantly influence disposition time for US civil cases (the dependent variable). His empirical study is based on a large sample of 6000 jury trials in some of the US’s most populous counties, utilizing nineteen independent (and so-called ‘dummy’) variables, including: case types, party types, case characteristics, and locale. Similarly, Sutton’s (2001) analysis of (criminal) jury trials in New Zealand provides another

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<sup>28</sup> Standard or ordinary linear regression analysis is functionally equivalent to analysis of variance, though the focus is on estimated coefficients that measure direct effects of factors on the dependent variable itself instead of their contribution to the variation or variance of the dependent variable: Barnes 2007.

<sup>29</sup> Regression analysis is not a panacea. Often, relevant variables are not observed and researchers have used more or less suitable proxy or control variables. Klick (2010) discusses limitations of regression analysis for evaluating causal effects in the context of legal institutions and their empirical contribution to economic growth and development. Stock (2010) addresses some general problems with inference in econometric analysis and points to more robust tools that have become available recently.



example of the application of regression analysis, where trial duration is measured with reference to: offence category; the number of charges; the number of accused; the maximum seriousness score of the offence; circuit (geographic area) and the level of the court. However, while the work of researchers such as Heise and Sutton represent a much more refined application of relatively sophisticated statistical tools to explain court behavior, both studies ignore endogenous variables.

### ***Regression Analysis and the Problem of Endogenous Variables***

The issue of ‘endogeneity’, or impact of feedback effects, is a major problem in standard regression analysis. Underlying the use of regression analysis is a common assumption that causality runs *from* the independent variable A to the dependent variable B. However, in more complex systems causality can also (and simultaneously) run the other way, with B influencing A. This is also referred to as simultaneous causality or reverse causality. In such systems causality not only runs from factors to the dependent variable but also, at the same time, in reverse order from the dependent variable to one or more of the factors. Ordinary regression analysis assumes all independent variables are model-exogenous variables and it cannot establish causation when this is not the case and one or more supposedly independent variables are instead endogenous.<sup>30</sup>

There is good reason to suggest that the issue of ‘endogeneity’ (two-way feedback) presents a particular problem in the utilization of regression techniques for the assessment of court delay. Our earlier hypothetical demonstrates this two-way causation (or simultaneous feedback) with reference to the relationship between criminal and civil court processing times. In such a context, the processing of civil cases is not independent of the processing of criminal cases, creating an interaction between the ‘outputs’ of a court. This interaction

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<sup>30</sup> For an explanation of statistically endogenous variables, see again Stewart (2005:201-202).

demands that two outputs, and therefore two endogenous variables, be modeled simultaneously, as one output cannot be analyzed without considering contemporaneous feedback to the other. There is good reason to believe that the determination of the duration of court proceedings also represents such a system. Luskin (1978-1979) has argued that, in this context, independent variables may not be truly independent, with two-way contemporaneous causation making it impossible to tell which way causation runs (Luskin 1978-1979). Variables that have been used by some researchers as independent variables may be influenced by case disposition times and vice versa, and are therefore endogenous. Examples of such variables are: filing cross/counter claims, the use of alternative dispute-settlement techniques, or which party wins. If regression modeling is to be accurate and meaningful, regression analysis needs to account for endogeneity.<sup>31</sup> Unfortunately, this has not happened in most previous studies.

There are notable instances where endogeneity is accounted for in regression analysis when studying judicial institutions, though not with reference to case disposition time. For example, Felli *et al.* (2008) develop a model explaining the *demand* of justice in Italy in the 1990's.<sup>32</sup> This study represents a significant advance by using appropriate econometric techniques that facilitate a far more comprehensive and accurate understanding of court behavior. Similarly, we seek to develop a powerful, although different, methodology to analyze key factors that influence case duration and identify underlying causes of delay.

### **“Echronometrics”: Regression Analysis with Feedback Effects**

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<sup>31</sup> Simultaneous causality, if ignored in ordinary regression analysis, leads to biased estimation results and mistaken causal inference (Stock and Watson 2007:325). The reason is that simultaneous causality causes correlation between the factor or factors and the error term in the regression. This means that the analysis involves more than one dependent variable and so-called multivariate analysis is required. See Klick (2007) on various methods for regression analysis, multivariate analysis and endogeneity. One commonly used regression method to deal with endogeneity is instrumental variables estimation where the endogenous factor is partly replaced by another variable, an instrumental variable. Finding appropriate instrumental variables is generally a difficult task. See Murray (2006) and Stock (2010: 86-87) on weak instruments.

<sup>32</sup> The study looked at 26 districts in Italy in the period 1994 to 2002.

Our distinctive new methodology – ‘echronometrics’ – offers a proper account of the role of endogenous relationships that recognizes feedback effects when studying the duration of litigation. This approach allows for the development of reliable (non-biased and consistent) estimates of the effects of many more factors than would be possible with ordinary regression analysis. In order to deal with endogenous variables we adapt more advanced regression techniques developed in the field of econometrics and label our more advanced model “*echronometrics*”, with *chrono* here referring to processing time. While the field of econometrics has developed statistical tools to uncover causal relationships in relation to economic behavior, we extend and apply these established techniques to uncover causal relationships in the civil justice system, focusing on factors that influence the duration of legal proceedings.

### ***Outlining an Echronometric Model***

By developing a more comprehensive model that sheds light on why different courts, at the same level, process essentially identical cases at different speeds and with varying amounts of resource inputs we aim to provide a novel framework for studying the ‘efficiency’ of courts engaged in the ‘production’ of justice. To be effective the model must reflect a broadly accepted conception of ‘case duration’ and ‘delay’, and must be able to draw on a consistent, comprehensive and accurate set of data gathered from a broad range of jurisdictions. These elements require a degree of collaboration and agreement amongst civil justice researchers that currently is absent. One goal of this article is to highlight both the need for, and possibility of, such agreement.

The need for a more comprehensive theoretical model for analyzing the duration of litigation and causes of delay has been long recognized. For example, Luskin points out shortcomings

of existing models<sup>33</sup> that she believes could be addressed by a comprehensive theory of case processing time that would ‘specify the relationships among all variables believed to affect case processing time’, allowing a mathematical representation of ‘multiple equations with reciprocal links and estimation from data gathered across courts and over time’ (Luskin 1978-79: 126). While Luskin acknowledges that she has neither the theory nor data for such a study, she argues – and so do we - that the goal of a comprehensive theory should be to guide research design and data collection in future research endeavors.

### ***Identifying Principal Variables***

Our proposed model requires a broad range of input variables that presuppose identification of a range of factors – including environmental - that determine the capacity of courts to process cases efficiently. These frequently overlooked environmental factors, including socio-economic variables, help expose and explain contextual differences that contribute to efficiency differentials between courts. Our goal is to isolate which factors really matter and to specify to what degree each factor impacts on court processing time. This approach draws upon the production model of court services proposed by Gillespie (1976). While significant differences exist between Gillespie’s and our ‘echronometric’ approach, both focus on the differences across courts in terms of the production of court services.<sup>34</sup> Notably, Gillespie is concerned with the optimal allocation of resources between criminal and civil cases and its effect on productivity. Most previous studies have adopted far too narrow a focus by only looking at either criminal or civil cases. Given that most modern courts operate both criminal and civil jurisdictions, a partial analysis is likely to distort any overall assessment of court performance.

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<sup>33</sup> Luskin notes that “the independent variables imply more than one dependent variable and more than one level of analysis.” Luskin 1978-1979: 118

<sup>34</sup> Our methodology and focus are quite different. Gillespie does not use a two-stage methodology with environmental variables, which has been developed only recently, and his focus is not directly targeted on a measure of efficiency.

To overcome this, our “echronometric” model specifies both input and output variables for the construction of a production model. Each court becomes a unit of observation. As a ‘multivariate analysis’ (Klick 2007) our model allows for multiple inputs *and* multiple outputs. This means that it is unnecessary to specify just one single aggregated measure of output. Potential outputs include: median processing time by type of case; dollar amounts awarded in civil cases; the number of civil cases disposed after the allocation of a hearing date; the number of cases disposed prior to the allocation of a hearing date; and cases pending and unresolved.

Sound data on these standard outputs are commonly kept in court record keeping systems, making them natural targets for empirical research. Environmental factors, on the other hand, are more difficult to identify and measure which is why it is important to develop hypotheses that can help cluster key variables and isolate potential proxies for such variables. The following table outlines potential input variables, and includes a brief discussion on the availability of data, drawing on conversations with staff in the South Australian Court Registry.<sup>35</sup>

<b>1. Judicial Structures and Resourcing</b>		
The first category of factors relate to the resourcing, both structural and administrative, of judicial institutions.		
<b>Influencing Factor</b>	<b>Input Variable</b>	<b>Notes</b>
<i>Judicial resources</i>	<ul style="list-style-type: none"> <li>• number of judges</li> <li>• judicial caseload per judge</li> <li>• judicial salaries</li> </ul>	This information is all readily available from Annual Reports etc
<i>Court Resources:</i>	<ul style="list-style-type: none"> <li>• the number of court buildings</li> <li>• the number of court rooms</li> </ul>	This information is all readily available from Annual Reports etc
<i>Court Characteristics</i>	<ul style="list-style-type: none"> <li>• the number of civil cases filed</li> <li>• the nature and characteristics of civil cases being processed</li> <li>• the number and characteristics of criminal cases that a court deals with</li> <li>• the socio-economic characteristics of a court district</li> <li>• the allocation of judicial resources</li> </ul>	Data is recorded with respect to key indicator dates. A record is kept of the nature of the principal ‘activity’ involved – the nature of the action or charge.

<sup>35</sup> We thank Steve Roder, Marc Marshall and Julianne Kouts for their time in discussing these matters with us.

	<i>within</i> the judicial system	A record is kept of the allocation of the judge's time
<b>General Court Infrastructure</b>	<ul style="list-style-type: none"> <li>the availability and number of administrative staff</li> <li>the availability and number of specific judicial support staff</li> <li>access to IT systems and resources</li> <li>the availability and utilization of technology such as video-conferencing and electronic submissions</li> </ul>	With appropriate authorizations, this information can be gathered
<b>2. Institutional Practices</b> The second broad category of factors involve the institutional practices of the court, both judicial and administrative, that control the way in which the court structures are organized, cases are managed, and the time of judges utilized.		
<b>Methods of Case-Management</b>	<ul style="list-style-type: none"> <li>what systems are available for a matter</li> </ul>	No record is specifically kept of which (of the available mechanisms) is utilized in a given case
<b>Alternative Resolution Methods</b>	<ul style="list-style-type: none"> <li>availability of alternative dispute processing resources</li> <li>sanctioning or mandating parallel alternative dispute resolution</li> </ul>	Information may be generally available, through rules etc, but no specific data is recorded
<b>Judicial Experience and Specialization</b>	<ul style="list-style-type: none"> <li>the number of years of experience of judges at a court</li> <li>any specialization of judges</li> </ul>	Years of experience could be calculated from appointment date No specific record is kept of judicial specialization
<b>Decision-Making Requirements</b>	<ul style="list-style-type: none"> <li>use of multi-judge benches</li> <li>prevalence of <i>ex tempore</i> decisions</li> <li>requirements for written opinions</li> </ul>	A record will be kept of when multiple judges sit A specific code is utilized when an <i>ex tempore</i> decision is handed down, so a record should be available of the use of this process A record is kept when that written judgment is delivered
<b>Judicial Training and Competence</b>	<ul style="list-style-type: none"> <li>judicial training undertaken</li> </ul>	No information is recorded or available with respect to judicial competence
<b>Extra-Curial Judicial Activities</b>	<ul style="list-style-type: none"> <li>speeches given</li> <li>articles written</li> <li>conferences attended</li> <li>voluntary and community work</li> </ul>	Some information on extra-curial activities is recorded and provided for the purposes of the Annual Report
<b>3. Behavioral and Cultural Factors:</b> The third broad category of factors examines the attitudes and behaviors of judges, lawyers, litigants and defendants involved in the dispute.		
<b>Judicial Behavior</b>	<ul style="list-style-type: none"> <li>managerial and legal competence of judges</li> <li>behavioral expectations of the given judicial culture</li> </ul>	No record is kept on this type of information – will require the identification of relevant proxy
<b>Lawyer Behavior</b>	<ul style="list-style-type: none"> <li>managerial and legal competence of lawyers</li> <li>behavioral expectations of the given legal culture</li> </ul>	No record is kept on this type of information – will require the identification of relevant proxy
<b>Parties' Behavior</b>	<ul style="list-style-type: none"> <li>behavioral expectations of the given legal culture</li> </ul>	No record is kept on this type of information – will require the identification of relevant proxy
<b>4. Dispute Complexity and Legal Factors:</b> The fourth category of factors examine the impact of the factual and legal complexity of a particular case.		
<b>Legal Complexity</b>	<ul style="list-style-type: none"> <li>the complexity of legal issues raised by the parties</li> </ul>	No specific record kept on the system of the complexity of the case. The only record of the

	<ul style="list-style-type: none"> <li>complexity/simplification of legislation and case-law</li> <li>nature of the proceedings- main cause of action</li> <li>nature of the proceedings- alternative causes of action</li> </ul>	<p>complexity of the case occurs where the case, in the Supreme Court, is entered onto the 'Long and Complex' case list</p> <p>A record of the main cause of action will be kept, and be reasonably readily accessible.</p> <p>No data is recorded as to any alternative causes of action</p>
<b><i>Factual/Technical Complexity</i></b>	<ul style="list-style-type: none"> <li>the number of witnesses</li> <li>use of expert witnesses</li> <li>the number of exhibits</li> </ul>	There is no electronic record kept, but manual records are kept of the trial that will record these issues
<b><i>Litigation Funding</i></b>	<ul style="list-style-type: none"> <li>party funded</li> <li>legal aid</li> <li>other external funding</li> <li>dispute among corporations, or among private individuals, or between a corporation and one or more private individuals</li> </ul>	There is no specific record kept as to the underlying funding of litigation, though useful information that is recorded include a record that is kept of when lodgment fees have been waived (an indicia of limited party resources) and when a party is self-represented.

### 5. Environmental Factors:

The final broad category of factors examines the impact of broader 'environmental' factors upon the duration of the proceedings. These macro-economic factors arise from the social context in which the dispute occurs.

		<b>Observations<sup>36</sup></b>
<b><i>Human Factors</i></b>	<ul style="list-style-type: none"> <li>the health/illness of participants</li> <li>demographic considerations</li> <li>ethnic and cultural factors</li> </ul>	Socio-economic data should look at immigration and the ethnic composition of a geographical area, as well as the health and social expenditures in that area. The United Nations has constructed a human development index for numerous countries. The components of this index are also available, such as: literacy rates, years of schooling, expenditure on health, gender equality, poverty index, life expectancy and others. <sup>37</sup> The OECD provides some similar data, as do national statistical offices. <sup>38</sup>
<b><i>Natural Factors</i></b>	<ul style="list-style-type: none"> <li>events such as floods, fires or earthquakes that may disrupt and delay proceedings</li> </ul>	Natural disasters such as earthquakes, flooding, droughts and fires impact on the operation of courts and the legal system in the affected areas. Such events can be accounted for statistically by including so-called dummy variables for the time periods that were affected. Searching newspapers online for such events would allow a researcher to gather data for the relevant dates. The database Factiva provides access to news from 200 countries and 35,000 sources. <sup>39</sup>
<b><i>Economic Factors</i></b>	<ul style="list-style-type: none"> <li>broad 'economic' and social conditions external to the legal system</li> </ul>	Relevant available socio-economic data will include: income per capita; population education levels (high school drop-out, high school, years of tertiary education, etc.); income distribution; the rate of unemployment; age distribution in the population; gross national product and

<sup>36</sup> Our observations are drawn from diverse sources, going beyond our conversations with South Australian court officials.

<sup>37</sup> See the range of data on human development across a large range of countries available at <http://hdrstats.undp.org/en/indicators>.

<sup>38</sup> National statistical offices of numerous countries make available extensive socio-economic data. Examples include: <http://www.abs.gov.au/> (Australia), <http://www.statcan.gc.ca> (Canada), <http://www.stats.govt.nz/> (New Zealand), <http://data.gov.uk/data/tag/economic> (UK), <http://www.ons.gov.uk> (UK), <http://www.bea.gov> (USA), <http://www.bls.gov> (USA), and <http://www.census.gov/> (USA).

<sup>39</sup> Factiva is available at <http://global.factiva.com>.

		the state of the economy (whether in a boom or a recession). <sup>40</sup> Socio-economic data are available from a variety of sources, such as international organizations like Eurostat, <sup>41</sup> the International Monetary Fund, <sup>42</sup> the OECD, <sup>43</sup> the United Nations, <sup>44</sup> the World Bank <sup>45</sup> and national statistical offices. <sup>46</sup>
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We do not claim to offer an exhaustive list of all possible variables that determine the duration of civil proceedings, but rather to illustrate factors likely to have a significant impact. To allow for comparability between studies across jurisdictions there has to be a measure of agreement on what constitutes the key variables that need to be assessed, a task we would assign to the next phase of our research.

### ***Utilizing Adapted Data-Envelopment Analysis***

The above principal variables should guide research to ensure a comprehensive set of data on the influences of case duration is collected. To draw meaningful information and conclusions from that data, however, we require a powerful modeling tool. This is where the notion of ‘echronometrics’ comes into its own by adapting an existing econometric statistical framework that draws on methods from operations research, data-envelopment analysis (‘DEA’). We propose modeling multiple court outputs simultaneously and using so-called bootstrap methods to bias-adjust estimated coefficients and construct confidence bands of a

<sup>40</sup> It would be necessary to apply a filter, such as the Hodrick and Prescott (1997) filter, that separates out cyclical fluctuations from a measure of economic activity, such as the gross national product of a country or region.

<sup>41</sup> For various member countries of the European Union, socio-economic data are available at <http://epp.eurostat.ec.europa.eu/portal/page/portal/statistics/themes>.

<sup>42</sup> See IMF online database “*International Financial Statistics*,” available at <http://elibrary-data.imf.org>.

<sup>43</sup> The OECD’s Main Economic Indicators electronic database has similar data to the *International Financial Statistics* but only for OECD member countries: <http://stats.oecd.org>.

<sup>44</sup> The United Nations (UN) makes available data beyond what is covered by the above sources on various human development measures: <http://unstats.un.org>.

<sup>45</sup> For example, the World Bank provides data on the ease of doing business in numerous countries, including some sub-national data, such as enforcing contracts for the quality of goods (costs, time and number of procedures involved in solving disputes), employment regulations, transparency of business regulations, and business density. See <http://www.doingbusiness.org>.

<sup>46</sup> It is worth noting that the International Labour Organization publishes a number of useful sources of relevant data, including the Yearbook of Labour Statistics (<http://www.ilo.org/stat/Publications/Yearbook/lang--en/index.htm>) and the Key Indicators of the Labour Market database (<http://kilm.ilo.org/kilmnet/>). Similarly, the Penn World Table, available from the Centre for International Comparisons at the University of Pennsylvania, provides economic data from national income accounts converted to international prices, based on purchasing-power-parity-based exchange rates: [http://pwt.econ.upenn.edu/php\\_site/pwt\\_index.php](http://pwt.econ.upenn.edu/php_site/pwt_index.php).



two-stage DEA analysis.<sup>47, 48</sup> This will allow the creation of a robust production model of court services that accounts for efficiency differences between courts.<sup>49</sup> We advocate the use of a cross-sectional analysis to compare courts in terms of their efficiency in transforming a given set of inputs into outputs. For the DEA method one calculates, by linear programming, an estimate of the efficiency with which each court handles this process. An initial set of efficiency scores will be generated by a flexible production function that transforms inputs into outputs in a way that avoids the use, at this stage, of other variables (particularly

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<sup>47</sup> Worthington (2001) provides a concise explanation of DEA. Cook and Seiford (2009) survey DEA advancements over a thirty year period. Recent applications of DEA analysis include Alexander et al. (2010) to New Zealand secondary school efficiency, Barkhi and Kao (2010) to evaluating the performance of decision making tools in information science, Erhemjants and Leverty (2010) and Cummins et al. (2010) to efficiency analysis in the insurance industry, and Chang et al. (2004) to the operating efficiency of hospitals. Simar and Wilson (2007) also survey a long list of studies that have applied DEA to the measurement and analysis of efficiency in a range of different organizations and settings. Unfortunately, as they point out, many studies suffer from a problem that arises because the DEA efficiency estimates are serially correlated. Simar and Wilson (2007) suggest the double bootstrapping method in order to bias-adjust the efficiency scores and to conduct consistent inference in DEA analysis. Furthermore, their methodology introduces stochastic analysis via bootstrap sampling and therefore allows for statistical inference. This methodological advance deals with a major criticism of standard DEA analysis: that it is non-stochastic so that any deviation from the efficient frontier must be interpreted as inefficiency that is not due to measurement error or other random factors. We suggest in this paper adopting their stochastic methodology. See also Simar (1996) and Simar and Wilson (1998, 2011).

<sup>48</sup> Juliet Aiken pointed us to the literature on structural equation modelling outside economics: Hancock and Mueller (2006) and Kline (2010). See also Pearl (2012). While this approach deals with measurement error (latent variables) to some extent, it requires setting up structural models, based on theoretical relationships, at the court and case levels, that are not available in the literature so far. In particular, hierarchical (multilevel) structural equation modelling requires decisions on the appropriate hierarchy, and correlation between factors at different levels can make causal inference difficult or impossible. Also, with random coefficient structural modelling, cases as the lowest unit of observation could be nested within courts and then the effects of court-level and case-level factors on case-level outcomes could be estimated simultaneously, instead of using courts as a unit of observation. However, this approach cannot predict court-level outcomes and multivariate outcomes would be very difficult to deal with.

<sup>49</sup> An alternative statistical method that could be applied to studying the progress of civil trials is duration or survival (hazard) modelling. We thank Bert Kritzer and Andrew Whitford for suggesting this approach to us. Greene (2008) and Cameron and Trivedi (2005) provide useful introductions to duration and hazard analysis. The duration of time, from the commencement of an event through to its conclusion, is modelled as a function of factors (variables). While duration analysis might seem to be a tool well suited to analysing court case durations, several problems arise with its application. First, the literature suggests a large number of alternative distribution functions for both duration and hazard, and choosing between them is frequently difficult and influences analytical outcomes. Second, accounting for *endogeneity* and *heteroscedasticity* further complicates the modelling (Cameron and Trivedi 2005). Third, allowing in addition for multivariate duration, i.e., with multiple transitions (destinations) to trial, pre-trial settlement, or out-of-court settlement, for example, leads to a highly complex model. We also need to differentiate civil from criminal cases. Bijwaard (2008) suggests instrumental variable methods for duration data. Such structurally dependent competing durations (risks) produce models that are cumbersome to both implement and interpret (Rosholm and Svarer 2001). Our preference is therefore to think of courts as “producing” multiple outputs instead of modelling duration distributions for each type of court output.

environmental variables) that will explain efficiency differences across courts.<sup>50</sup> Only in the second stage of the analysis will these broader variables, including the environmental variables, be taken account of in order to explain, by the use of statistical regression, what actually causes differences in efficiency across courts.

For this DEA analysis, the relevant unit of observation is the court. The approach compares courts in their different socio-economic settings along with other court-specific environmental factors for a given time period. DEA is a performance measurement technique that empirically measures productive efficiency of each court in the sample relative to the efficiency of all the other courts in the sample. One advantage of this DEA approach is that, as a cross-section study, it can be repeated for different time periods in order to compare changes over time. Another significant advantage of using DEA is that it can be applied to non-profit organizations. While public institutions such as courts “produce” justice, this cannot, we argue, be treated in quite the same way as private profit-maximizing firms in the market. In addition, DEA does not require specifying a functional form for the production process of legal services and it can deal with multiple inputs and multiple outputs. DEA measures technical (or “managerial”) efficiency relative to a non-parametric maximum likelihood estimate of the unobserved true production frontier. The DEA framework can be applied in order to identify and compare factors that explain differences in efficiency within a country’s legal system. However, the DEA is also a general methodology that can be applied to other jurisdictions in a parallel manner to explain cross-cultural differences in efficiencies across different jurisdictions. This approach allows a common and comparable form of analyzing data, yet has sufficient flexibility to account for differences in the context and environment of different courts.

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<sup>50</sup> DEA permits evaluation of the relative efficiency of the decision-making units (courts in our case) without imposing *a priori* weights on the inputs and outputs in the production function.

## Conclusion and discussion

Delay, whether in courts or in processes outside them, has the potential to prolong, and indeed cause, injustice for the parties, but it can also undermine the productivity and efficiency of the economy at large. However, while there have been significant reforms aimed at alleviating delay, promoting efficient and timely dispute-resolution, such reforms have not always been effective, and in some cases could have exacerbated the problem. The failure to found these reform efforts on a sound empirical understanding has undoubtedly contributed to their failure (Heise, 1999-2000:813, 848).<sup>51</sup> While empirical research into case duration should guide policy (Heise, 1999-2000:813), too often reform has been guided by ‘impressions or anecdotes’ rather than quality data analysis that establishes causation (Heise 1999-2000: 848). In part, this can be attributed to the fractured nature of the empirical research, and its failure to satisfactorily establish causation. By contrast, we have sought to confront some underlying challenges for the empirical study of delay by providing a common foundation for future research. In order to assess the true impact of procedural reform on court performance, and to guide more effective future reforms, a new comprehensive methodological tool is necessary: ‘echronometrics’.

This article addresses these issues by clarifying what data is required, and why. This should assist the identification of acceptable proxies, as well as the development of a more standardized approach to promote effective comparative and statistical analysis. Our ‘echronometric’ model draws upon developments in the field of econometrics to propose a more reliable empirical methodology capable of explaining the duration of civil trials. Ultimately, both judicial and executive authorities share responsibility for collecting and interpreting accurately information that explains both case duration and abnormal delay.

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<sup>51</sup> Heise recognises that most civil justice reforms “regrettably, address variables that do not appear to influence trial disposition time”: Heise, 1999-2000:848

Empirical research remains vital in helping to identify potential policy changes that may improve the overall health of the court system. However, if that research is to provide a more accurate and comprehensive understanding of case duration, researchers must begin to collaborate with each other and policymakers to develop a uniform, systematic approach to data collection and analysis. If such standards can be developed and adhered to, then this will make possible the creation of intelligent systems with the capacity to monitor accurately court, human and economic behavior.

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