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# Impacts of electronic case management systems on court congestion in the Philippines

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## About this report

3ie accepted the final version of the report, *Impacts of electronic case management systems on court congestion in the Philippines*, as partial fulfilment of requirements under grant PWP.03.SC.IE awarded through Country Policy Window – Philippines. The content has been copy-edited and formatted for publication by 3ie.

The 3ie technical quality assurance team for this report comprises Stuti Tripathi, Rosaine Yegbemey, Tara Kaul, Kirthi V Rao, Sayak Khatua, an anonymous external impact evaluation design expert reviewer and an anonymous external sector expert reviewer, with overall technical supervision by Marie Gaarder and Emmanuel Jimenez. The statistical analysis code used in generating the results in this study is available on 3ie's Harvard Dataverse. We are unable to make the datasets publicly available due to confidentiality requirements agreed between the Supreme Court of the Philippines, 3ie and the Innovations for Poverty Action (IPA). However, 3ie has reviewed and quality assured replication for datasets used in this evaluation. The 3ie editorial production team for this report comprises Anushruti Ganguly and Akarsh Gupta.

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# **Impacts of electronic case management systems on court congestion in the Philippines**

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**Impact Evaluation Report 133**

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## Summary

The eCourt system is an electronic case management system that records case information and allows courts and other judicial stakeholders to monitor case incidents. Aside from better recording and monitoring of cases, it aims to champion transparency and accountability in trial courts through the electronic raffling of court cases.

This study evaluates the impact of the eCourt system's adoption on court efficiency, using a 'difference-in-differences with matching' approach. We observe court-level and case-level outcomes. For court-level outcomes, we consider the clearance rate and disposition rate, with the former referring to case outflow relative to case inflow, and the latter referring to case outflow relative to case inflow and pending cases. For case-level outcomes, we look at case duration – the time it takes to resolve a case from the date of filing.

We find that in the first year of rollout the eCourt system had no overall impact on the disposition rate and saw a decline in clearance rate. In contrast, the second year saw a decrease in case duration by 103 days, alongside a reduction in pending cases. We also find mixed evidence on the proportion of cases resolved within 180 days and 360 days in the first year, but largely positive effects by the second year. Together, these findings suggest that the primary impact of the eCourt system is on pending cases, and that its overall impact on these cases is small relative to case inflow. They also highlight the challenges of setting up and adjusting to a new system during the first year of rollout.

Findings from the qualitative interviews and online survey of judges and clerks of court present generally positive perceptions and experiences of the eCourt system. Nonetheless, respondents reported several issues with the system, including insufficient infrastructure and equipment, inadequate training of court personnel, limited IT support, and staff shortages causing the data encoding and updating of court records to be constrained.

From a policy perspective, not factoring in costs, we stipulate that a fully implemented eCourt system is a worthy investment, as its automation features contribute to better case management through electronic raffling, dashboards and digital records. Our online survey finds that these features are valued by judicial staff. However, the courts need ample time to learn and adjust to the new system in order to improve efficiency, and deal with lower throughput in the transition period while they have to maintain dual systems. To address implementation issues, we recommend court staff training; regular updating of the system; provision of a user manual with troubleshooting; adding human resources support for encoding; availability of on-call IT support; and provision of hardware and connectivity in court branches.

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## **Abbreviations and acronyms**

eCourts	electronic courts
FGD	focus group discussions
IPA	Innovations for Poverty Action
IRB	Institutional Review Board
JUSTICE	Judicial Strengthening to Improve Court Effectiveness
KII	key informant interview
SC	Supreme Court of the Philippines



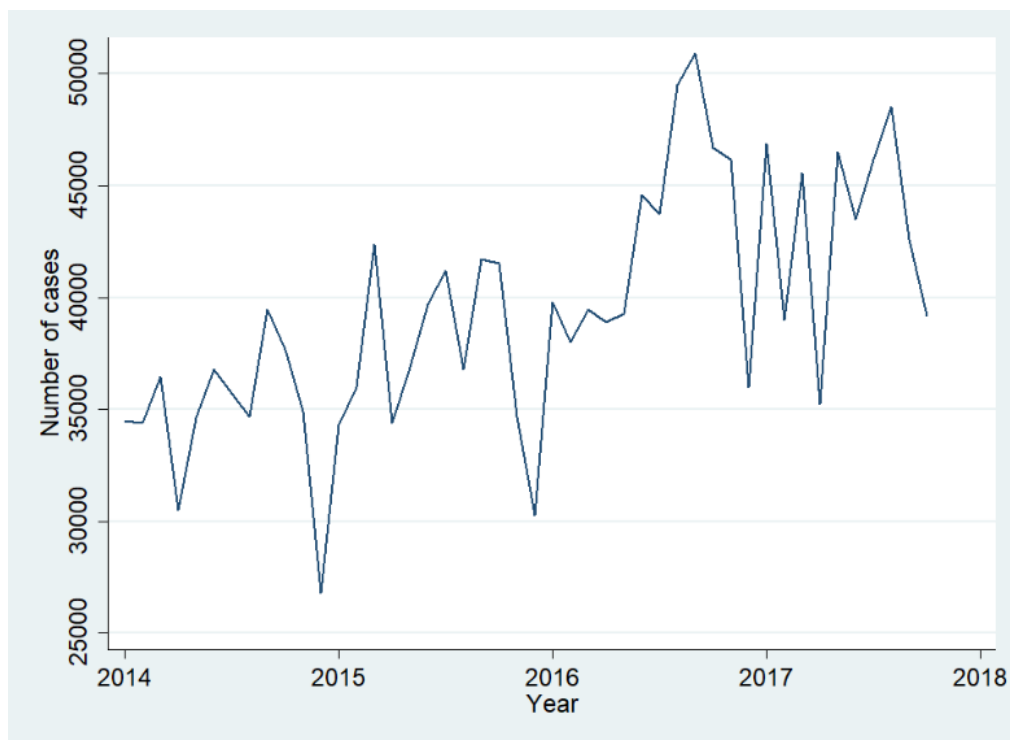
# 1. Introduction

## 1.1 Context<sup>1</sup>

An effective legal system is a litmus test for state capacity and a key condition for a functioning market economy. Better justice is both an end in itself and a means to achieve broader development objectives (World Bank 2012). In a bid to provide their citizens with better justice in line with the United Nation’s Sustainable Development Goal 16 on ‘peace, justice and strong institutions’, governments around the world have introduced wide-ranging judicial reforms, including revisions to procedures, changes in case management practices, and use of technology. However, little is known about how successful low- and middle-income countries have been in implementing such reforms, and to what effect.

The Philippine judiciary has long faced the challenge of court congestion, leading to severe delays in case resolution and high levels of backlog. The total numbers of newly filed cases and pending cases in the courts have continued to rise steadily over time. While the average number of newly filed cases per month in the lower trial courts was 35,000 in 2014–2016, it had escalated to an average of around 43,000 per month in 2016–2018 (Figure 1). This upward trend of newly filed cases has contributed to a steady upward trend in the total number of pending cases across all lower courts. Before the end of 2017, the total number of unresolved cases had reached nearly 900,000 (Figure 2).

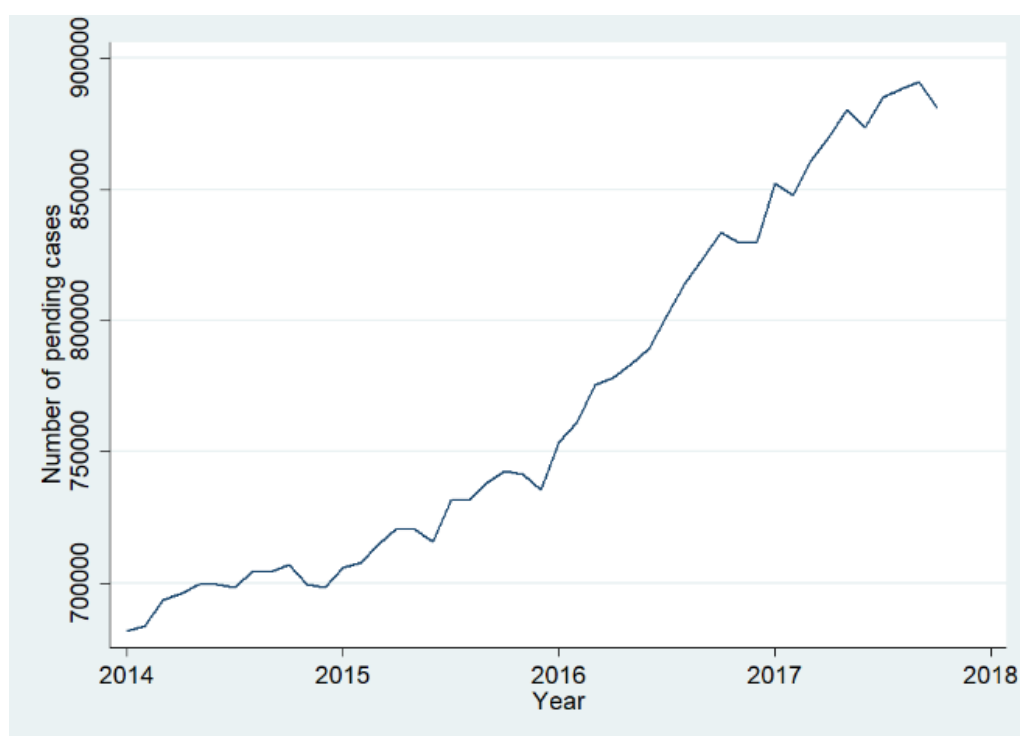
**Figure 1: Total number of newly filed cases per month (2014–2018)**



Source: Monthly caseload reports data, Supreme Court of the Philippines.

<sup>1</sup> This section is common across the three reports in this study series.

**Figure 2: Total number of pending cases per month (2014–2018)**



Source: Monthly caseload report data, Supreme Court of the Philippines.

Since the initial World Justice Project Rule of Law Index rankings in 2015, the Philippines has seen a steady decline in rank, scoring below the global and regional average in the overall rule of law index, particularly on criminal justice and fundamental rights (World Justice Project 2020). In response, the judiciary has implemented several reforms in recent years, in line with the current government's goal of providing 'swift and fair administration of justice' to gain the trust of its citizens and the confidence of the international community (as outlined in the Philippine Development Plan 2017–2022) (NEDA 2017). A central goal of these reforms is to improve court efficiency, thereby speeding up cases and reducing court congestion.

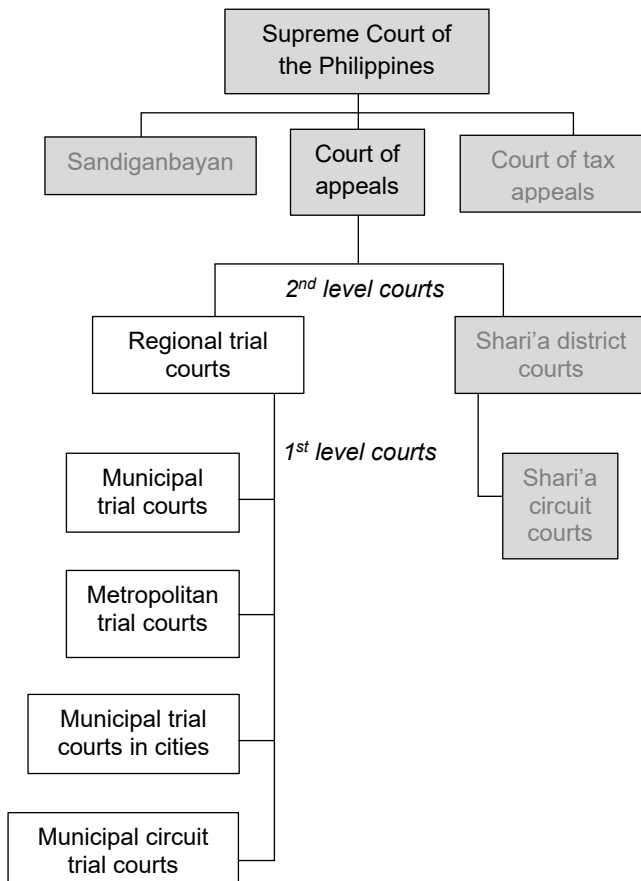
The International Initiative for Impact Evaluation (3ie) and Innovations for Poverty Action (IPA) have partnered with the Supreme Court of the Philippines (SC) to conduct a research study to understand the impacts of three justice reforms on court efficiency. The study series assesses the implementation and impacts of three notable reforms, namely: the electronic courts case management system (eCourts) to improve operational efficiency and transparency; the Rules of Procedure for Small Claims Cases to reduce court burden and ensure access to justice; and the Revised Guidelines for Continuous Trial of Criminal Cases to increase disposition of criminal cases. Assessment of these three reforms is intended to help the judiciary compare the merits of each program and make informed decisions on how to allocate available resources across the judicial system to achieve its stated goals..

## 1.2 The Philippine judiciary

The judiciary has four levels with the SC at the top of the hierarchy, as illustrated in Figure 3. At the second level are the Court of Appeals, the Sandiganbayan,<sup>2</sup> and the Court of Tax Appeals. The courts covered in the study are the first- and/or second-level trial courts (excluding Shari'a courts). Courts at the first level have jurisdiction at the municipality level and are the lowest level of trial courts. The four types are distinguished by geographic areas covered:

1. Municipal trial courts (MTCs), which cover one municipality;
2. Municipal circuit trial courts (MCTCs), which cover two or more municipalities;
3. Metropolitan trial courts (MeTCs), which are MTCs in Metropolitan Manila; and municipal trial courts in cities (MTCCs), which are MTCs in cities outside Metropolitan Manila.

**Figure 3: Organogram of the Philippine Judiciary**



Some first level courts may have more than one branch. The second level courts – regional trial courts – are the highest level of trial court. Second level courts are established in each of the 13 judicial regions, with each region covering several provinces, except for the National Capital Judicial Region, which covers cities and municipalities. A second level court has multiple branches throughout its region.

<sup>2</sup> The Sandiganbayan is a special appellate collegial court that has jurisdiction over criminal and civil cases involving graft and corrupt practices and other offenses committed by public officers and employees, including those in government-owned or government-controlled corporations.

According to SC data, there are 1,090 second level court branches and 1,191 first level court branches in the country.<sup>3</sup>

### 1.3 Literature<sup>4</sup>

Strong institutions encourage investment and growth (Pande and Udry 2005; Rodrik 2000, 2005). Courts play a central role in strengthening institutions, with judicial efficiency a key measure of the costs of doing business in a country (World Bank 2017) as well as its institutional quality (Botero et al. 2003; Djankov et al. 2003; Lichand and Soares 2014; Ponticelli and Alencar 2016; Visaria 2009). Both the private and public sector rely on the judicial system to enforce contracts and realize the benefits of regulatory change (Ahsan 2013). Slow justice can impede market development (Chemin 2009a; Jappelli, Pagano and Bianco 2005; Laeven and Majnoni 2005; Laeven and Woodruff 2007; Powell, Cristini and Moya 2001; Visaria 2009), reduce firm growth (Amirapu 2017; Chakraborty 2016), weaken public sector performance (Coviello et al. 2016), and enable higher crime rates and increased industrial riots (Köhling 2002).

Yet the empirical literature on improving judicial productivity in developing countries is scant. In more developed countries, court-level studies prevail (Chang and Schoar 2006) and there is a lack of detailed case-level data (Coviello et al. 2016). Rigorous evidence on policy options to reduce judicial delays is rare (Chemin 2009b). In most studies, the evidence linking improved justice to investment fails to establish causality (Aboal, Nova and Rius 2014). Furthermore, the potential spill-overs (positive and negative) and trade-offs of speeding up adjudication are seldom documented (Kondylis and Stein 2018).

The evidence that does exist provides some indication of what works – successful reforms include training judges on better case flow management in Pakistan (Chemin 2009b); adopting first-in-first-out procedures in Italy (Bray et al. 2016); placing time limits on decisions in Senegal (Kondylis and Stein 2018); establishing specialized courts and simplifying procedures in Brazil (Lichand and Soares 2014); providing better information to litigants in Mexico (Sadka, Seira and Woodruff 2018); or implementing a bundle of reforms, including court-appointed mediation, limits on trial duration and adjournments, required affidavit furnishment, and mobile justice in India (Chemin 2009a).

Informative as these studies are, they by and large offer a relatively haphazard selection of options, with little claim to external validity, political considerations or the overall set of policy levers available to government. This is particularly important given that the political economy of policy reform is of central importance. For example, Dakolias and Said (1999) find in four countries (Colombia, Peru, Argentina and Ukraine) that judicial reforms work best when implemented in lower courts, with support from the top and from different stakeholders (such as lawyers, businesses, NGOs and communities). In addition, such reforms are best accompanied by changes in culture and management practices that complement administrative and procedural reforms. This suggests not only that the external validity of other studies is limited, but also that there is much to be learned by understanding the implementation successes and failures of multiple reforms within a single judicial system, thereby getting at the deeper questions of what worked, and why.

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<sup>3</sup> Data source: Monthly caseload reports database, extracted February 2020.

<sup>4</sup> This section is common across the three reports in this study series.

As noted earlier, the Philippine judiciary has invested heavily in several justice innovations, three of which (electronic case tracking, simplified procedures for small claims, and better case management practices) we study here. These reforms are intended to make the judicial system more efficient, transparent and accessible, and to improve the performance of judicial staff. This study contributes to the literature both by applying a common research approach enabling comparison across the three reforms, and by using a combination of qualitative and quantitative data to understand not just narrow impacts, but the mechanisms behind them.

## **1.4 This study**

This report focuses on the impacts of the eCourt system, while two companion reports cover the Revised Guidelines for Continuous Trial of Criminal Cases and the Rules of Procedure for Small Claims Cases.

We divide the remainder of the report into five sections. Section 2 describes the eCourt system and its underlying theory of change, while Section 3 provides an overview of the difference-in-differences approach, primary research questions, outcomes of interest and data collection methodology. Section 4 presents the findings, including descriptive statistics, empirical specifications and estimated impacts. The final two sections discuss challenges and lessons learned, before concluding the analysis.

## **2. Intervention**

### **2.1 Electronic courts case management system**

The eCourt program introduced an automated electronic case management system to the courts, thereby allowing judges, clerks of court and the public to monitor case incidents in real time. The eCourt system aimed to improve operational efficiency, as well as the transparency and accountability, of first and second level trial courts. It was developed and maintained by the American Bar Association Rule of Law Initiative under Judicial Strengthening to Improve Court Effectiveness (JUSTICE), a United States Agency for International Development and Philippine government project aimed at improving the rule of law. The project supported initiatives in areas such as computerizing case tracking and management in the courts, decongesting courts by systematically identifying long-standing cases for resolution, and streamlining rules of trial to reduce the potential for delay.<sup>5</sup>

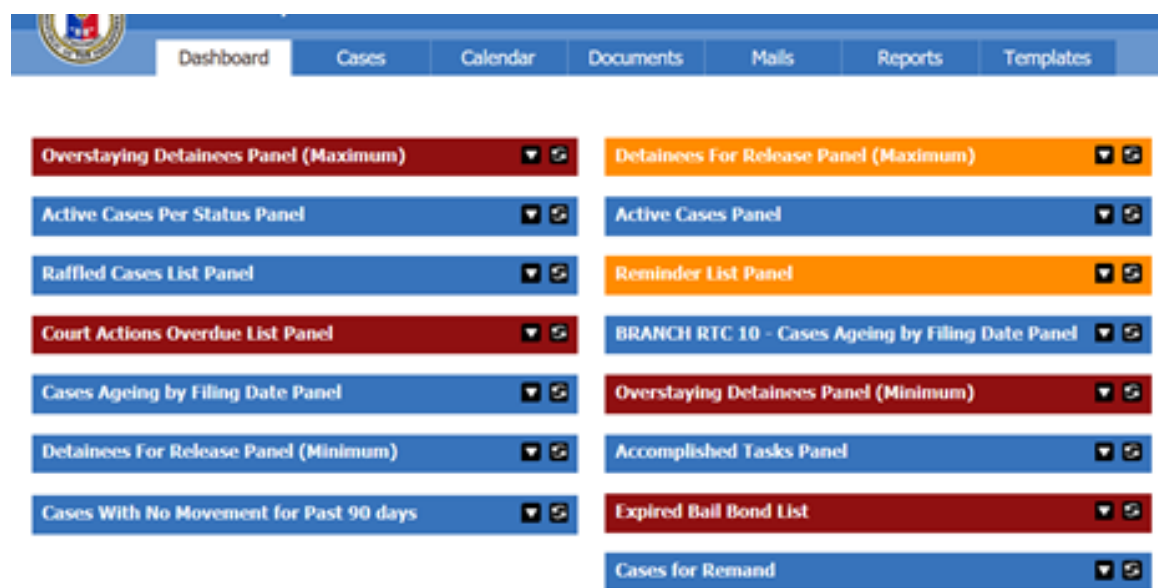
The eCourt program was first launched in 2013 in 58 pilot courts in Quezon City, a city in Metropolitan Manila that accounted for 7.5 per cent of the country's total number of cases that year. Following the pilot, the eCourt system was rolled out to additional courts in phases by city with a prioritization of courts with high caseloads as well as courts with high commercial caseloads to facilitate a better investment climate. Tacloban, a city ravaged by typhoon Yolanda (international name Hainan), was made a special case in order to facilitate the rebuilding of records that were almost entirely wiped out. Currently, 10 of the Philippines' 146 cities have adopted the eCourt system, covering a total of 327 courts.

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<sup>5</sup> See [www.usaid.gov/philippines/partnership-growth-pfg/justice](http://www.usaid.gov/philippines/partnership-growth-pfg/justice).

The eCourt system has two main components: (1) court computerization, including a case management system for operational support; and (2) an on-site kiosk allowing public access to basic case information. The core features of the eCourt system include docketing of cases; electronic raffling of cases; monitoring and management via a dashboard of dates important to a case; generating reports and calendars; recording of different actions taken during hearings, including decisions and writs of execution; printing and serving of orders from the bench; and determining and recording fee payments. These measures sought to improve transparency by linking court kiosks with eCourts, providing supervising judges with easy access to case records, and ensuring fairness in case assignment through e-raffling. The eCourt dashboard outlines the said features of the eCourt system as shown in Figure 4.

**Figure 4: eCourt Dashboard**



The system is role based, with different levels of access permitted depending on the user role. User roles include clerk of court/branch clerk of court, assessor, cashier, docket clerk, encoder, report generators, sheriff, stenographer, interpreter, judge and executive judge. With each rollout, the American Bar Association Rule of Law Initiative provided training, coaching and mentoring for court staff and judges. The eCourt system is currently locally networked within each hall of justice, and still requires litigants to file cases on-site at the court. After receipt, verification and payment of applicable fees, a case will be raffled on the spot to an assigned branch. This is then followed by docketing and encoding, and the transmission of the physical case folders from the Office of the Clerk of Court to the assigned branch. Case details will already have appeared in the system of the assigned branch.

After three years of implementation, an initial assessment of the JUSTICE project – which incorporated a number of simultaneous initiatives, including eCourts – found a 60 per cent reduction in the median processing times of trial cases.<sup>6</sup> A later assessment of the JUSTICE project covering 2014–2017 found a 42 per cent reduction in the average age of pending cases compared to before the initiatives were launched. However,

<sup>6</sup> See [www.usaid.gov/philippines/partnership-growth-pfg/justice](http://www.usaid.gov/philippines/partnership-growth-pfg/justice).

despite this reduction in the average age of pending cases, as well as a reduction in overall case inflow, the report also found that average clearance and disposition rates decreased over the same time period.

## **2.2 Theory of change**

As noted in Section 1.1, the Philippine judicial system suffers from court congestion, long trial durations and non-streamlined case management. The Philippine Development Plan 2017–2022 specially notes as a key issue to be addressed that ‘Backlogs in resolving cases and delays in case development procedures continue to increase, and penal facilities are occupied way beyond capacity’ (NEDA 2017). The theory of change for the eCourt system, shown in Figure 5, has been formulated by the research team based on consultations with SC Office of the Court Administrator and Chief Justice, and verified through qualitative interviews of executive judges, presiding judges, branch clerks of court, prosecutors and lawyers, as described in Section 3.2 of this paper.

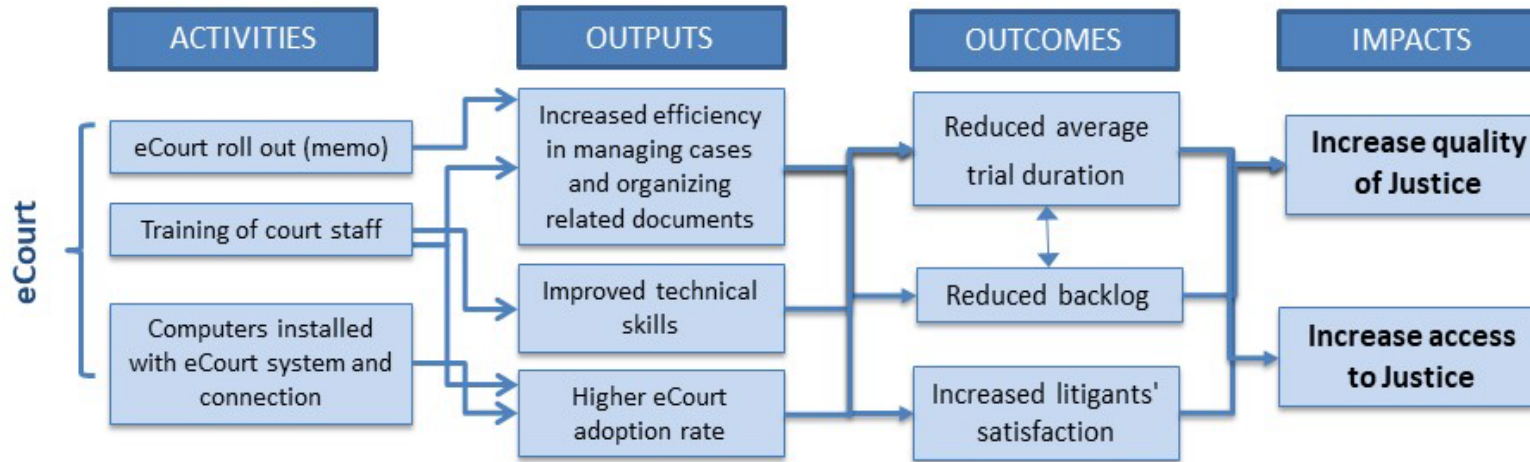
The SC issued a memorandum on the implementation of eCourts regarding its rollout, training of court staff who are supposed to use the tool and the installation of infrastructure needed to access it. Once rolled out, it was anticipated that the courts’ case management would become more efficient and effective, and that an improvement would be seen in staff’s technical skills. Better case management would then lead to reductions in case duration and case backlogs. Importantly, it was assumed that improved case management would not increase bottlenecks at the judge’s decision stage. Furthermore, it was assumed that eCourts would result in an increase in litigant satisfaction, especially if more courts adopted the eCourt system. In turn, this would improve the quality of and access to justice.

Critical assumptions regarding the success of eCourt’s implementation rest on ensuring regular and proper use of the eCourt system. That is, in order to improve daily workflow and workload, staff need to integrate the use of eCourt into their work. This may be counterintuitive in the beginning, as during the transition to the new system staff will have an increased workload. On top of the traditional manual system (or any other branch-initiated system), staff also need to record their cases in eCourt. The eCourt features become more usable and accurate through increased staff use of the system.

Thus, the theory of change rests on several assumptions: (1) courts have sufficient basic infrastructure, such as computers, network connection and office space, to ensure that the eCourt system is fully functioning when rolled out; (2) encoding and regular updating of old and new cases is completed; (3) staff are receptive to the eCourt system; (4) regular trainings and updates are given to both existing and new staff; (5) inefficient case management is a cause of delay or resetting of trials; (6) prosecutors, the public attorney’s office and litigants benefit from eCourt in getting faster updates on cases; (7) a stable justice environment exists; and (8) there is an absence of negative external shocks.

While our quantitative data only allows us to test the overall impacts of the eCourt reform on court efficiency – as measured by our main outcome variables (clearance rate, disposition rate, case duration and proportion of cases disposed in a timely way) – in Section 4.1 we use our qualitative data and online survey findings to explore the various mechanisms, such as eCourt use and implementation constraints.

Figure 5: Theory of change for eCourt



- Assumptions:**
- Courts have basic infrastructure such as computers, network connection, office space to ensure that eCourt fully functioning when rolled-out
  - Encoding and regular updating of old and new cases is done
  - Staff receptive of eCourt
  - Trainings and updates are regularly given to old staff and new staff

- Assumptions:**
- Inefficient case management is a cause of delay or resetting of trials
  - Prosecutor, PAO and litigants benefit from eCourt in getting faster updates on cases

- Assumptions:**
- Stable justice environment
  - Absence of negative exogenous shocks



## 3. Evaluation

### 3.1 Research questions and outcomes<sup>7</sup>

Our overarching research question is whether improvements in technology and case management practices improve court efficiency and reduce congestion.

We measure court efficiency through four main outcomes, each of which are essential to understanding impact. The first two, both measured at the court level, are:

1. Clearance rate: The clearance rate is defined as the court's case outflow (cases disposed) divided by case inflow (new cases), and provides the simplest measure of court efficiency as a 'flow' of cases – in other words, is the court resolving at least as many cases as are coming in?
2. Disposition rate: By contrast, the disposition rate measures the 'stock' of cases – i.e. pending and backlogged cases – and is defined as cases disposed divided by the sum of both new and pending cases. For this reason, it is a more comprehensive measure of court performance, but can be less responsive to reforms that do not directly address pendency.

Both these rates are calculated from the Monthly caseflow report database, which comprises aggregated monthly caseflow data submitted to the SC by first and second level courts.

The third and fourth outcomes are measured at the case-level:

1. Case duration: Case duration is defined as the number of days from the date of filing to the date of court decision. While this is the most direct way of measuring judicial speed, it is only defined for resolved cases – meaning that any cases pending in court are excluded from the analysis.
2. Case disposed in <#> days: To ensure that results are meaningful and not driven by data censoring, we also include a second case-level outcome in the form of a dummy variable measuring whether or not a case was disposed within a given number of days of filing. This outcome is defined for all cases, and has the additional benefit of being duration-flexible – in other words, it can be used to draw out the impact trajectory of any reform by measuring impacts over, for example, 3, 6, 9 or 12 months. This is especially useful in the context of this study, where different reforms have different expected timelines of impact.

### 3.2 Design and methods

#### 3.2.1 Quantitative design and methods

The staggered rollout of the eCourt system allows us to compare the difference between eCourts and regular courts ('non-eCourts'), before and after the introduction of eCourt functionality, using a difference-in-differences with matching approach.<sup>8</sup> We consider courts where the eCourt system was implemented as the treatment group, and compare

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<sup>7</sup> This section is common across the three reports in this study series.

<sup>8</sup> While the ideal design would have been randomized allocation across the population of potential eCourts, the eCourt system had already been implemented in most target courts when the evaluation study began, and the research team had no control over which courts the system was being installed in.

them to regular courts. Since the rollout is not randomized, a difference-in-differences with matching is the most robust approach available. The combination of differences nets out time-invariant and group-invariant characteristics, while the matching strategy seeks to ensure that the observed and unobserved characteristics of both groups' are similar. Specifically, the first difference (within court, over time) nets out the effect of (observed and unobserved) time-invariant characteristics, while the second difference nets out the effect of group-invariant characteristics (across treatment and control groups). The matching approach described below seeks to ensure that the two groups are comparable, allowing us to interpret variations in these two differences across the matched sample as causally identified effects of the eCourt intervention.

The matching approach was constrained by data availability for the comparison group (non-eCourts), which involved extracting, digitizing and processing paper court docket records. This is a time-consuming and costly process, meaning that given limited time and resources we had to use readily available data to identify which non-eCourts to prioritize – in other words, we had to match courts before looking at case-level data. Matching on pre-intervention trends in primary outcomes ensures that we satisfy the parallel trend assumption by design (Galiani, Gertler and Schargrodsky 2005; Heckman, Ichimura and Todd 1997, 1998). We chose to match on the disposition rate because, as discussed in Section 3.1, it considers both the stock and flow of cases in each court, and is thus a good summary measure of court performance.<sup>9</sup> Given the relatively low number of court pairs, these two stratification criteria provide sufficient variation to create pairs.

Specifically, we calculate the yearly change in the disposition rate in all years prior to implementation. This refers to the change from 2013 to 2014 for eCourts launched in 2014, the change from 2013 to 2015 for eCourts launched in 2015, and so on. The yearly case flow data covers the period from 2013 to 2018, meaning that eCourts launched in 2013 were not included in the matching due to lack of prior data, while those launched in 2018 were also dropped due to lack of post-eCourt data. Hence, the matching years cover 2014 to 2017.

Table 1 highlights the annual average disposition rate of matched courts until the year of eCourt adoption in first level courts. Table 2 highlights the same for matched second level courts.

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<sup>9</sup> Matching on a pre-trend change in a key outcome such as disposition rate is arguably preferable to matching on an arbitrary set of covariates, as it is a reasonable assumption that the former is better at capturing unobserved confounders. We did not match on location (or socioeconomic characteristics of location), as most eCourts are in the National Capital Judicial Region area. We were unable to get complete data on judge characteristics, another covariate under consideration in the pre-analysis plan.

**Table 1: Average disposition rate per year, first level matched courts**

ECourts				non-eCourts			
Year of outcome	Year of eCourt adoption			Year of outcome	Year of eCourt adoption		
	2015	2016	2017		2015	2016	2017
2013	0.5874	0.6623	0.7515	2013	0.5627	0.6258	0.6520
2014	0.5693	0.5904	0.7225	2014	0.5422	0.5470	0.6223
2015	0.6140	0.6203	0.6931	2015	0.5887	0.5632	0.5930
2016	0.6237	0.6370	0.6846	2016	0.6288	0.5994	0.5881
2017	0.6167	0.6471	0.6426	2017	0.6829	0.6525	0.5380
2018	0.5875	0.5978	0.7203	2018	0.6628	0.7023	0.6088

Source: Case flow report data, Supreme Court of the Philippines.

**Table 2: Average disposition rate per year, second level matched courts**

Year of outcome	Year of eCourt adoption				Year of outcome	Year of eCourt adoption			
	2014	2015	2016	2017		2014	2015	2016	2017
2013	0.3894	0.3373	0.3753	0.4342	2013	0.3599	0.3645	0.3011	0.3451
2014	0.3659	0.3354	0.4221	0.4856	2014	0.3368	0.3645	0.3405	0.3938
2015	0.4035	0.3483	0.4672	0.4923	2015	0.3381	0.3738	0.3706	0.3993
2016	0.3998	0.2824	0.4189	0.4796	2016	0.3010	0.3539	0.3338	0.3800
2017	0.4202	0.2938	0.4858	0.4203	2017	0.3316	0.3544	0.3240	0.3377
2018	0.5076	0.4383	0.4960	0.5950	2018	0.4020	0.4363	0.4340	0.4625

Source: Case flow report data, Supreme Court of the Philippines.

For the matching process, we first stratify courts by level (first and second level courts) and then calculate changes in disposition rates for all court years prior to eCourt adoption. We then match on pre-trends using all available pre-data for eCourts and non-eCourts. This means that if an eCourt was launched in 2015, we match it with a non-eCourt that has a similar pre-2015 change in disposition rate. We use matching with replacement, meaning some non-eCourts have more than one eCourt match. Since eCourt launch dates vary by court, we create a synthetic timeline, with the eCourt launch as time zero. Subsequently, we apply the launch date of each eCourt to its non-eCourt pair. We then label observations as belonging to either before or after the launch date.<sup>10</sup>

The universe of observations included in the analyses encompasses a period two years either side of the reform being implemented. It is assumed that this period reflects the full transition from the old system and thus gives a fair estimate of the reform's effect. This means that at the court level we limited the range of observed disposition rates to two years from the year of eCourt rollout. At the case level, we considered cases filed within two years before or after eCourt introduction.

<sup>10</sup> An alternative approach, pursued by Goodman-Bacon (2018), deals with the different timing of treatment in natural time. By contrast, our study uses synthetic time, with eCourt launch considered time zero for both the eCourt and the matched non-eCourt – much like a canonical DID analysis. This is more suitable, as the digitized data for non-eCourts only provides data for two years either side of the reform being implemented, and not enough variation in timing of treatment to expect difference to be visible.

In light of digitization capacity constraints, we calculated the minimum detectable effect sizes that could be found given the number of matched courts. For these calculations, we used an updated eCourt dataset from January 2020, which included more information than the dataset used in the initial power calculations and thus allowed us to compute better estimates.

We calculate minimum detectable effect sizes for case-level outcome variables using two-means, clustered options of power in Stata. The numbers for mean, standard deviation (SD), and intra-cluster correlation (ICC) come from a sample of pre-intervention eCourt data. For case duration (Table 3), we find that 231 and 58 pairs of courts are required in order to detect, respectively, effect sizes of 0.1 SD (76 days) and 0.2 SD (152 days). In our study, which consists of 116 pairs, we can detect an effect size of 146 days, or slightly under 0.2 SD.

**Table 3: Minimum detectable effect size, case duration**

Effect size	Clusters	Cluster size	Mean	SD	ICC
0.1SD (76 days)	231	50	713	758	0.126
0.2SD (152 days)	58	50	713	758	0.126

### **3.2.2 Qualitative design and methods<sup>11</sup>**

We conducted qualitative research to further investigate our quantitative findings and explore reasons for weak links in the chain of causation laid out in the theory of change. We gathered the perceptions, experiences and levels of satisfaction of judges and clerks of court in relation to the justice reform programs. In coordination with SC offices, selected judges and clerks of court were invited to participate in either focus group discussions (FGDs) or key informant interviews (KIIs). In March 2020, due to the COVID-19 pandemic and the resultant guidelines/restrictions imposed by the Philippine government, we shifted the FGDs to remote KIIs using video conferencing platforms. To complement these interviews and gain further perspective on the impact of eCourt reforms from other key players, the team also conducted interviews with prosecutors, public attorneys and private attorneys.

To increase the sample of responses on how the judicial reforms were experienced and perceived, we also launched an online survey for judges and clerks of court. The qualitative questionnaire and initial FGD findings guided the design of the online survey, which was subsequently administered – through the offices of the SC and the Philippine Judges Association – to judges and clerks of court at all first and second level trial courts.

We used rapid thematic analysis of the interviews to identify emerging themes and refine the online survey. At the end of each day of data collection, the research team debriefed and recorded their impressions. Following the completion of data collection, the team conducted a second round of content analysis on the transcribed interviews using a shared coding tool.

### **3.2.3 Timeline**

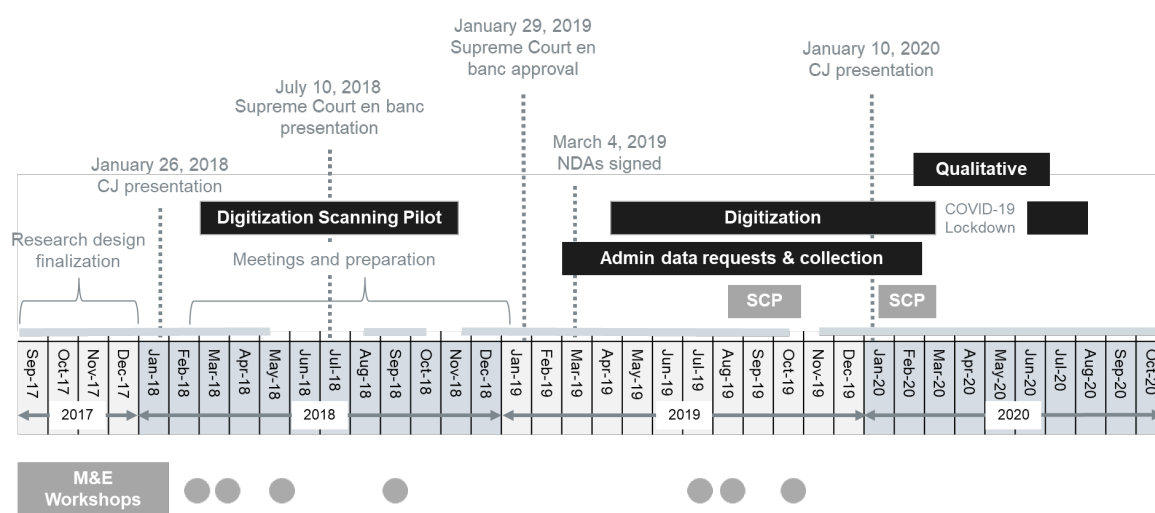
Figure 6 illustrates the overall project timeline and includes key milestones and all data collection activities undertaken by the team during its engagement with the SC. It also

<sup>11</sup> This section is common across the three reports in this study series.

shows the series of monitoring and evaluation capacity-building workshops conducted in 2018 and 2019 with SC offices.

Due to a series of leadership transitions within the SC, the team faced a long unanticipated delay at the start of the project. On 29 January 2019, the SC approved the final research design and on 4 March 2019 the team signed a series of non-disclosure and confidentiality agreements with the SC.

**Figure 6: Study timeline**



The two data collection activities relevant to the eCourts study consisted of: (1) collection of administrative data; and (2) collection of qualitative data. In 2018, the team piloted digitization with the scanning of court dockets, and in 2019 coordinated with the various offices to formally request and collect relevant administrative data. Much of the second half of 2019 and the first half of 2020 was spent with the large-scale scanning and conversion of files to usable datasets. The team also made occasional requests for updated datasets, with the last set received in January 2020. Meanwhile, the qualitative instruments were piloted in February 2020 and the first set of FGDs conducted in March 2020. Due to the COVID-19 pandemic and the guidelines/restrictions imposed by the Philippine government, the team then shifted the FGDs to remote interviews. We conducted the remote interviews and launched the online survey in June and July 2020.

### 3.3 Ethics<sup>12</sup>

The Human Subjects Committee for IPA provided oversight for this project, ‘Impact Evaluation of Three Supreme Court Reforms in the Philippines: eCourt, Continuous Trial Guidelines, and Small Claims Procedures’, protocol # 14339. On 28 February 2018, the board found the study to be of minimal risk and approved the administrative data collection component.<sup>13</sup> In accordance with the requirements of the IPA Institutional Review Board (IRB), we put in place procedures to ensure data security, including encryption of data files and assigning unique codes to cases, court branches and judges. All research team members obtained certificates in human subject research, and all

<sup>12</sup> This section is common across the three reports in this study series.

<sup>13</sup> At the time of submission, the research design also included two randomized experiments with survey data collection.

research team members and project personnel signed non-disclosure and confidentiality agreements with the Supreme Court of the Philippines. Data collection activities were conducted in coordination with and under the guidance of the SC Program Management Office and the Office of the Court Administrator.

In July 2019, an IRB amendment to the protocol was approved for the inclusion of FGDs with judges and clerks of court for eCourts, as well as the quasi-experimental design using administrative data for the three reforms. In September 2019, an IRB amendment was approved for data collection activity covering limited case information on money claims case values above the small claims threshold (control) from the lower courts.<sup>14</sup> In February 2020, an IRB amendment was approved for a revised FGD questionnaire, protocol guide and consent covering all three reforms. Following COVID-19 and approval from the chief justice, two subsequent amendments (April and June 2020) were approved to shift from FGDs to remote KIIs using a secure video call platform and the inclusion of an anonymous online survey using a secure digital data collection platform. Upon completion of the project, all data, information and materials shared by the SC will be returned or destroyed.

### **3.4 Sampling and data collection**

#### ***3.4.1 Sample selection***

We use a Mahalanobis distance matching algorithm<sup>15</sup> on data from 1,089 second level court branches and 1,170 first level court branches, using the yearly disposition rate as the primary matching indicator. Courts that installed the eCourt system in 2013 and 2018 were excluded from the matching due to the data limitations described in Section 3.2.1. This results in 305 eCourts (72 first level courts and 233 second level courts). We use matching with replacement to pair each of these with a regular court (non-eCourt). Our final sample includes 259 non-eCourts (69 first level courts and 190 second level courts). All 305 court pairs are used in the court-level analysis. Details are summarized in Table 4 below.

For the case-level analysis, we prioritized non-eCourts that had complete dockets extending to two years either side of the establishment of their matched eCourt(s). The number of court dockets digitized were fewer than the total number of court-level pairs: of the 305 court pairs, only 116 have fully digitized datasets. This corresponds to 22 first level eCourts and 94 second level eCourts in the sample. One hundred of these are in the National Capital Judicial Region (NCJR), while the remaining 16 are distributed across Luzon, Visayas and Mindanao.<sup>16</sup> All these courts are found mostly in adjacent cities.

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<sup>14</sup> This amendment is relevant to the study on Rules of Procedures for Small Claims Cases reform.

<sup>15</sup> The PSMATCH2 used to conduct the matching is available at: <http://ideas.repec.org/c/boc/bocode/s432001.html>.

<sup>16</sup> The Philippines is commonly split geographically into three large island groupings: Luzon in the north, Visayas in the center, and Mindanao in the south.

**Table 4: Distribution of eCourt and non-eCourt pairs by sample and island group**

Island group	eCourts			non-eCourts		
	Total	Court-level sample	Case-level sample	Total	Court-level sample	Case-level sample
NCJR	249	221	100	138	21	12
Luzon	11	10	3	761	125	42
Visayas	57	37	7	470	58	20
Mindanao	42	37	6	369	55	13
TOTAL	359	305	116	1,738	259	87

Meanwhile, the 116 court pairs consist of 87 non-eCourts: 20 from the first level and 67 from the second level. Of these, only 12 are in National Capital Judicial Region, 42 are in Luzon, 20 are in Visayas and 13 are in Mindanao. Table 4 displays the breakdown of eCourt and non-eCourt locations included in each sample, by island group, while Figure 7 shows the geographic distribution of these court pairs.

**Figure 7: Map of eCourts and non-eCourts in the study sample**



Note: The eCourt court branches are distributed among 10 geographically proximate cities, while the matched non-eCourts branches are dispersed across the country. The map was generated using R (OpenStreetMap, CARTO, 2020).

### **3.4.2 Quantitative data source and description**

For the court-level analysis, the primary source of data is the yearly case flow report, which contains data from all court branches and provides details of the number of pending, incoming and outgoing cases per court from 2013 to 2018. From these variables, we derive the annual disposition rate and annual clearance rate.

For the case-level analysis, the two main sources of quantitative data are the eCourts system database and the dataset of digitized court docket inventory records. The eCourts system database is an electronic case management system developed for the eCourt reform and rolled out in the selected cities from 2013 to 2018. The system records case-level details – from case filing to resolution – for all case types, including court assigned, case number, nature of case and other relevant case information. It also includes dates, such as the date of filing and date of resolution, which are used to determine the duration of each case. As of data extracted in March 2019, there were 305 lower courts with data available in the eCourt system.

The court docket inventories are logs of active cases that exist in each court station and are submitted in hard copy by all courts to the SC on a biannual basis. The docket inventories contain information on: (1) case number, title and nature of case; (2) date of filing, pre-trial, arraignment, initial trial and last trial; and (3) court action taken at time of log. These inventories are stored for at least five years in the SC before being properly disposed of. We scanned and converted the inventories to datasets by processing pages through software or encoding their content manually. However, many of these dockets are incomplete or no longer employable for digitization due to faded text or the quality of paper used in printing. As of October 2020, we were able to digitize a total of 87 non-eCourt dockets. These 87 courts correspond to 116 eCourts (22 first level and 94 second level courts).

### **3.4.3 Quality control and consolidation of data sources**

The court docket inventories were meticulously digitized to make the data accessible and useful for analysis. First, the highest possible quality scan was made for each docket inventory. Next, the scans were converted to Excel and CSV files using optical character recognition software and/or hand-encoding. The conversion process had five stages, involving multiple rounds of checking to ensure consistency with the original scanned copies. Due to the varying levels of available information from the dockets, case details were summarized to the earliest and latest dates. To ensure that the same case was being compared when identifying these dates, case numbers and case types were normalized across all digitized dockets. As mentioned in Section 3.4.1, we were able to fully digitize court dockets from 87 non-eCourts.

We appended the clean and organized court docket inventory dataset to the matched 116 eCourts dataset extracted from the eCourt system, thereby creating the consolidated dataset used for analysis.

While consolidating, we generated pair identifiers to tag each non-eCourt with its matched eCourt pair. We also created common variables to indicate the start and end of a case. The variable 'Date\_begin' corresponds to – in order of priority, should a particular date be unavailable – date filed, date raffled or date received. The variable 'Date\_end' corresponds to when the case was resolved, which includes the decision date and close



date. The eCourts dataset already had these dates recorded. However, for the digitized dockets, we filtered cases using search terms related to case resolution such as 'dismissed', 'decided', 'archived', 'closed', 'sentenced', 'acquitted' and 'promulgated'. These terms are not uniform across all the courts and include errors such as misspellings or improper spacing. Thus, we also sifted through the cases manually and included more specific phrases in the list of keywords.

Furthermore, we created a synthetic timeline to align the dates of eCourt rollout, using the date of the outcome variable and subtracting from it the corresponding date of eCourts rollout. This creates a measure of elapsed time in which a negative value means that the outcome was observed before the reforms, while a positive value means that it was observed after the reforms. We applied this method to the court-level and case-level datasets, with the former's unit of time being years elapsed and the latter's days elapsed.

For both case-level datasets, we dropped observations with incomplete case information and cases with negative case durations, as these occurrences are attributable to wrong encoding and are not reliable data points. We assigned unique identification codes for court branches, case numbers and judges. We maintained only the fields necessary to conduct the analysis.

#### **3.4.4 Qualitative data and online survey<sup>17</sup>**

For the collection of qualitative data, we focused on the geographic areas of National Capital Region, Cebu City and Davao City, as all three judicial reforms under evaluation by the research team had been implemented in these areas. To allow for diverse perspectives and experiences, we initially based participant selection on a range of criteria, including judge's length of service, duration of eCourt implementation, level of court, and preliminary results of quantitative outcomes measured. To an extent, the initial selection also took into account the proximity of a court to the proposed FGD location, in consideration of the time participants would be expected to spend outside of court. In coordination with SC offices, we initially selected and invited 58 judges and clerks of court to participate in either: (1) one of six FGDs; or (2) KIIs with the judge and/or clerk of court.

Following the first set of FGDs conducted in March 2020, the COVID-19 pandemic and the resultant guidelines imposed by the Philippine government prompted us to shift the remaining FGDs to remote KIIs using video conferencing platforms. During this process, we again coordinated with the SC to identify remote interview participants from the initial selection, based on participants' access to internet, knowledge of technology platforms and availability. Taking into account these additional factors, we did not invite five judges and six clerks of court chosen for the original selection, and did not find replacements as the rapid analysis showed that we were approaching saturation. However, we did determine the need to complement the planned interviews with judges and clerks of courts with interviews with prosecutors, public attorneys and private attorneys. Generally, we find that in-person interviews are better for establishing rapport and capturing interview setting, tone and non-verbal cues. Nevertheless, remote online video interviewing represents an efficient and effective method of collecting qualitative data when conducted with additional preparations, such as pre-coordination with participants

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<sup>17</sup> This section is common across the three reports in this study series.

to adequately explain the purpose of the study, and finding the appropriate time and schedule for the remote interviews. Table 5 shows participant characteristics by region, position and sex.

**Table 5: Qualitative participants by region, position and sex**

Position	Cebu		National Capital Region		Davao		Total	% Female
	Total	% Female	Total	% Female	Total	% Female		
(Sex)								
Judges	9	44%	7	71%	8	50%	24	54%
Clerks of court	9	78%	5	100%	9	89%	23	87%
Prosecutors/Public attorney's office/ Private lawyer	1	100%	7	29%	3	67%	11	45%
<b>Total</b>	<b>19</b>	<b>63%</b>	<b>19</b>	<b>63%</b>	<b>20</b>	<b>70%</b>	<b>58</b>	<b>66%</b>

Notes: Judges and clerks of courts in Cebu participated in FGDs based on position, while the other participants participated in remote KIs.

Overall, using either FGDs or remote KIs, we collected qualitative data from a total of 58 participants (68% female), consisting of 24 judges, 23 clerks of court and 11 prosecutors/lawyers. Personnel data from the SC indicates that in 2018, 50% of the judges were female, showing that we have a gender-balanced sample of judges. Participation across the three regions was fairly distributed, with 33% in Cebu, 33% in National Capital Region and 34% in Davao. We conducted 2 in-person FGDs in Cebu (31% of participants);<sup>18</sup> 12 individual and 2 paired remote KIs with judges; 3 individual and 4 paired KIs with clerks of court; 2 paired KIs with both the judge and clerk of court; and individual KIs with 3 public attorneys, 2 private lawyers and 5 prosecutors.

The FGDs and remote KIs used the same questionnaire guide (Appendix A: FGD guide) to gather the perceptions, experiences and levels of satisfaction of the judges and clerks of court regarding the justice reform programs. In most cases, each interview (including FGDs) had one main facilitator, one co-facilitator, one documenter, and one or two principal investigators. Each interview (including FGDs) was audio recorded, with consent, and transcribed.

To gather a wider sample of judge and clerks of court perceptions regarding the judicial reforms, we launched an online survey, developed using guidance from the qualitative questionnaire guide and initial findings from the FGDs (Appendix B: Online survey).<sup>19</sup> Using a digital data collection platform that offers a web-based option, we coordinated with the SC offices under the Office of the Court Administrator, as well as the Philippine Judges Association, to administer the online survey to judges and clerks of court in all first and second level courts. The online survey was available for three weeks in July 2020. To encourage participation, we regularly sent updates to the offices on the number of participants per judicial region. In total, 1,579 people participated in the online survey, consisting of 644 judges, 882 branch clerks of court and 53 clerks from the Office of the

<sup>18</sup> We were supposed to do the same for the Davao and National Capital Region courts, but the government imposed a lockdown due to COVID-19. Hence, we shifted to remote one-on-one/paired interviews for the remaining judges, clerks of court and other judicial stakeholders, using Zoom or Microsoft Teams.

<sup>19</sup> While a survey of the public is beyond the scope of this study, this would be a natural next step.

Clerks of Court. This included 517 respondents from eCourt branches (217 judges, 289 BCCs and 11 clerks from the Office of the Clerks of Court). Participation by first and second level courts was roughly half and half.

### **3.4.5 Estimating equation and hypotheses**

Using court-level and case-level information for matched eCourts and non-eCourts, we estimate impacts using the following equation:

$$Y = \beta_0 + \beta_1 P + \beta_2 T + \beta_3 P * T + X\gamma + R\delta + \varepsilon$$

Here,  $Y$  is the outcome of interest;  $P$  is the period of eCourt adoption indicator (1 after eCourt implementation, 0 otherwise);  $T$  is the eCourt indicator (1 if an eCourt, 0 otherwise);  $X$  is the court-pair (for court-pair fixed-effects);  $R$  is the year of outcome (for year fixed-effects); and  $\beta_3$  is the estimate of impact. We initially planned to include judges and court characteristics, but the data we have for them are incomplete and would further limit the number of courts that could be used in the analysis. Hence, we use court-pair and year fixed-effects to capture the unobserved effects associated with judge and court characteristics.

The main hypothesis of the study is:

$H_0$ : The adoption of eCourts speeds up disposal of all types of cases.

We use court-pair fixed-effects in all specifications and adjusted errors for clustering at the court level in regressions using case-level outcomes. Clustering adjustment is not needed for court-level analysis because the unit of observation is by court.

## **4. Findings**

### **4.1 Impact analysis**

Given the eCourt was launched on different dates across the courts, in order to have an integrated analysis a synthetic timeline was created by aligning the beginning date of a case to the corresponding eCourt launch date. Thus, cases in a given eCourt filed at the same time as the eCourt launch would have time 0. In addition, non-eCourts paired more than once with eCourts appear in the dataset the same number of times – while adjusting for the corresponding eCourt launch date – to ensure the samples are balanced.

We conduct two types of analyses. The first uses court-level data, involving all 305 eCourts paired with non-eCourts. The second is a case-level analysis, involving 116 eCourt–non-eCourt pairs.

#### **4.1.1 Court-level analysis**

Using court-level data, Table 6 summarizes the mean outflow, inflow, pending cases, clearance rate and disposition rate for eCourt and non-eCourt pairs for the year the eCourt system was established. For eCourts, the average inflow and outflow are higher for first level courts than for second level courts. By contrast, non-eCourts have a higher number of incoming and outgoing cases for second level courts. Across court levels for both eCourts and non-eCourts, the mean clearance rate is more than 1, while the disposition rate is below 1. This demonstrates that in the year of eCourt establishment, court pairs are bogged down by the number of pending cases despite having more outflow than inflow.

**Table 6: Descriptive statistics, eCourt and non-eCourt**

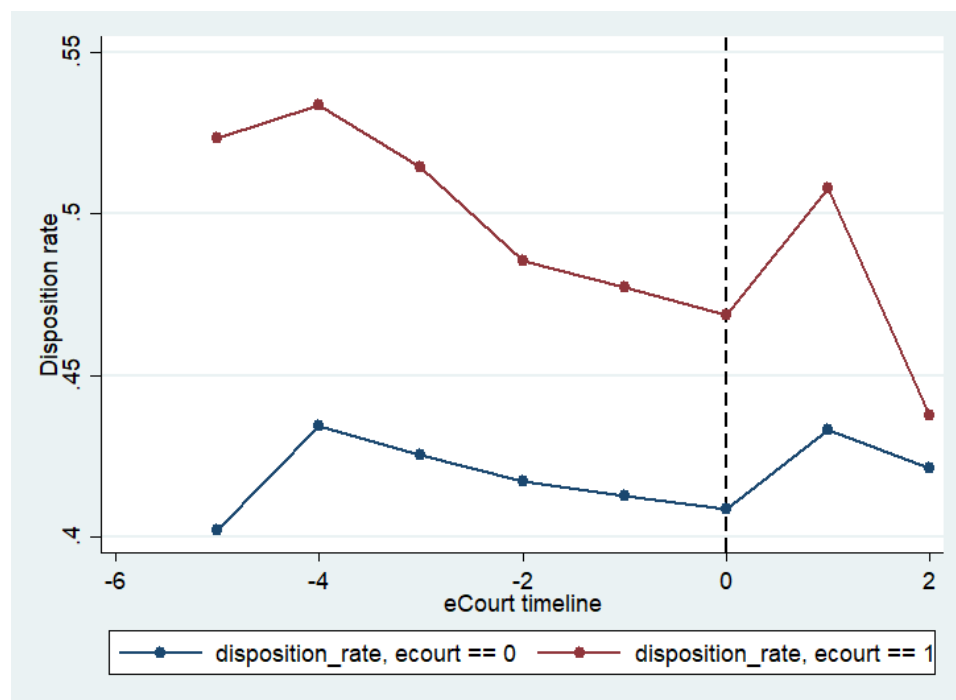
	eCourts		non-eCourts	
	First level	Second level	First level	Second level
Mean inflow	853.49	341.82	227.35	322.19
Mean outflow	908.18	323.81	242.71	290.22
Mean pending	553.32	470.91	198.82	577.71
Mean clearance rate	1.11	1.22	1.20	1.25
Mean disposition rate	0.65	0.41	0.57	0.36

Notes: Average clearance and disposition rate for eCourts and non-eCourts within two years of eCourt implementation.

Source: Case flow report.

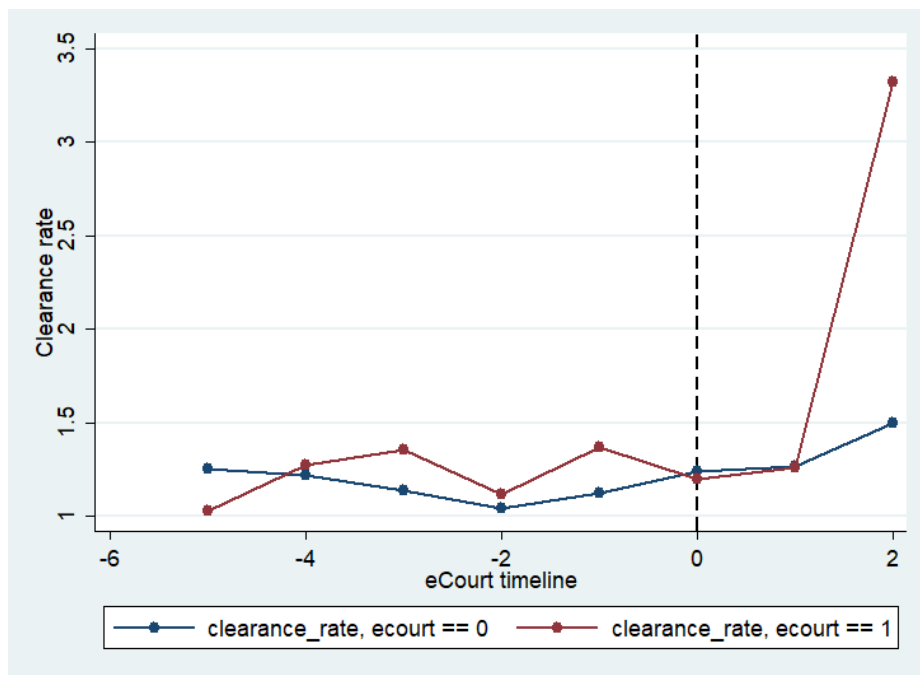
Figure 8 presents the average yearly disposition rates of eCourts and their matched non-eCourts across time, with time 0 being the year the eCourt system was installed in the courts. It extends beyond the two years before the eCourt launch, showing a downward trend beginning four years prior to launch. It also highlights a spike in the first year after eCourt implementation and a decline in its second year. Though courts with the eCourt system have higher rates, the yearly movements for both are the same. This establishes a parallel trend for disposition rates before the reform.

**Figure 8: Trend of disposition rates for eCourt and matched non-eCourts**



Similarly, Figure 9 presents the average yearly clearance rates of eCourts and non-eCourts across time. They are mostly within the 1–1.5 range, with values remaining close to each other until the first year after the launch of the eCourt. However, the similarity in trend prior to the reform is not as clear as for disposition rates.

**Figure 9: Trend of clearance rates for eCourt and non-eCourt pairs**



We also quantitatively test whether pre-intervention trends – as represented by the changes in the annual clearance and disposition rates – are significantly different. The results of a paired T-test show that they are not (Table 7).

**Table 7: Paired T-test results of pre-intervention trends in clearance and disposition rate**

Outcome	Obs	eCourts		Non-eCourts		Difference		P-value
		Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.	
Clearance rate	116	-0.015	0.068	-0.005	0.087	-0.010	0.096	0.922
Disposition rate	116	0.002	0.005	0.002	0.006	0.000	0.002	0.889

The impact of the eCourt system is estimated using a difference-in-differences with matching method. Using the pre-eCourt launch trend in disposition rates, the eCourts were matched with replacements to non-eCourts. The estimations look at two timeframes: (1) one year either side of eCourt launch; and (2) two years either side of eCourt launch. The former timeframe evaluates outcomes within one year of eCourt implementation, while the latter extends the scope of the evaluation period. Hence, the model looking at two years either side of eCourt launch has more observations, as it includes an additional year of observed outcomes both before and after launch. Looking at these two timeframes highlights the effects of eCourt over a shorter and longer time frame. This is important, especially given learning to use a new technology can take time.

The estimations also consider variations using court-pair fixed-effects and court fixed-effects with year fixed-effects. Furthermore, the case-level models also adjust errors for the clustering by court.

Table 8 shows the impact of the eCourt system on the disposition rate. These two periods account for the transition and learning required to fully operate the system. The

variable 'eCourt' is a dummy variable equal to 1 if a court has the eCourt system, and 'post' is a dummy variable equal to 1 for the period following eCourt implementation. eCourt X Post is the interaction of eCourt and post, the coefficient of which provides an estimate of the eCourt system's effect.

**Table 8: Difference-in-differences in disposition rates**

VARIABLES	1 year: court-pair fixed-effects	1 year: court and year fixed-effects	2 years: court-pair fixed-effects	2 years: court and year fixed-effects
eCourt	0.0644*** (0.0120)	0.0644*** (0.0116)	0.0661*** (0.00888)	0.0661*** (0.00863)
Post	0.00966 (0.0105)	-0.0409*** (0.0130)	0.0211** (0.00839)	-0.0270** (0.0113)
eCourt X Post	0.00254 (0.0149)	0.00254 (0.0143)	-0.0110 (0.0118)	-0.0110 (0.0114)
Constant	0.411*** (0.00850)	0.374*** (0.0200)	0.406*** (0.00631)	0.389*** (0.0118)
Observations	1,756	1,756	2,616	2,616
R-squared	0.491	0.528	0.456	0.486

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Pair fixed-effect, court fixed-effect and year fixed-effects not shown.

Across models and timeframes, the results show that while courts with the eCourt system have a consistently higher disposition rate, there is no statistically significant difference in court efficiency after they have installed the system compared to the non-eCourts.

Table 9 shows the impact of the eCourt system on the clearance rate. Unlike the disposition rate, the clearance rate of courts with the eCourt system declined in the first year after the system was installed, as well as in relation to the established difference with non-eCourts. However, the deterioration of efficiency disappears in the second year of eCourt implementation.

**Table 9: Difference-in-differences in clearance rate**

VARIABLES	1 year: court-pair fixed-effects	1 year: court-pair and year fixed-effects	2 years: court-pair fixed-effects	2 years: court-pair and year fixed-effects
eCourt	0.248** (0.117)	0.248** (0.116)	0.169 (0.341)	0.169 (0.341)
Post	0.150 (0.102)	-0.124 (0.131)	0.238 (0.323)	-0.575 (0.448)
eCourt X Post	-0.276* (0.144)	-0.276* (0.144)	0.234 (0.452)	0.234 (0.451)
Constant	1.109*** (0.0826)	0.957*** (0.201)	1.077*** (0.243)	0.582 (0.464)
Observations	1,756	1,756	2,615	2,615
R-squared	0.185	0.197	0.104	0.108

Notes: Robust standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Pair fixed-effect, court fixed-effect, and year fixed-effects not shown.

The combination of no impact on disposition rate and a decline in clearance rate suggests that eCourt may be having opposing impacts: slowing down the flow of cases

(the inflow–outflow ratio, or clearance rate) but not overall efficiency (inflow–stock ratio, or disposition rate). Table 10 shows that this is indeed true, with the eCourt system reducing the number of pending cases in each court – this is not statistically significant in the one-year period bandwidth but is strongly significant by the second year. This is in line with the judiciary implementing a first-in-first-out system for case resolution – new cases come in but are put to the back of the queue, while pending cases are dealt with first. As a result, pending cases fall, but so does the clearance rate, resulting in a non-significant overall effect on the disposition rate. This suggests that the primary effect of eCourt is on pending cases, and that the overall impact on these cases is small relative to case inflow.

**Table 10: Difference-in-differences in pending cases**

VARIABLES	1 year: court-pair fixed-effects	1 year: court-pair and year fixed-effects	2 years: court-pair fixed-effects	2 years: court-pair and year fixed-effects
eCourt	42.75 (28.80)	42.75 (28.77)	53.22** (21.01)	53.22** (21.02)
Post	62.67** (25.26)	103.3*** (32.38)	84.99*** (19.87)	102.7*** (27.61)
eCourt X Post	-53.81 (35.65)	-53.81 (35.61)	-66.89** (27.82)	-66.89** (27.84)
Constant	442.6*** (20.39)	495.4*** (49.75)	433.9*** (14.94)	443.6*** (28.63)
Observations	1,756	1,756	2,616	2,616
R-squared	0.436	0.439	0.417	0.417

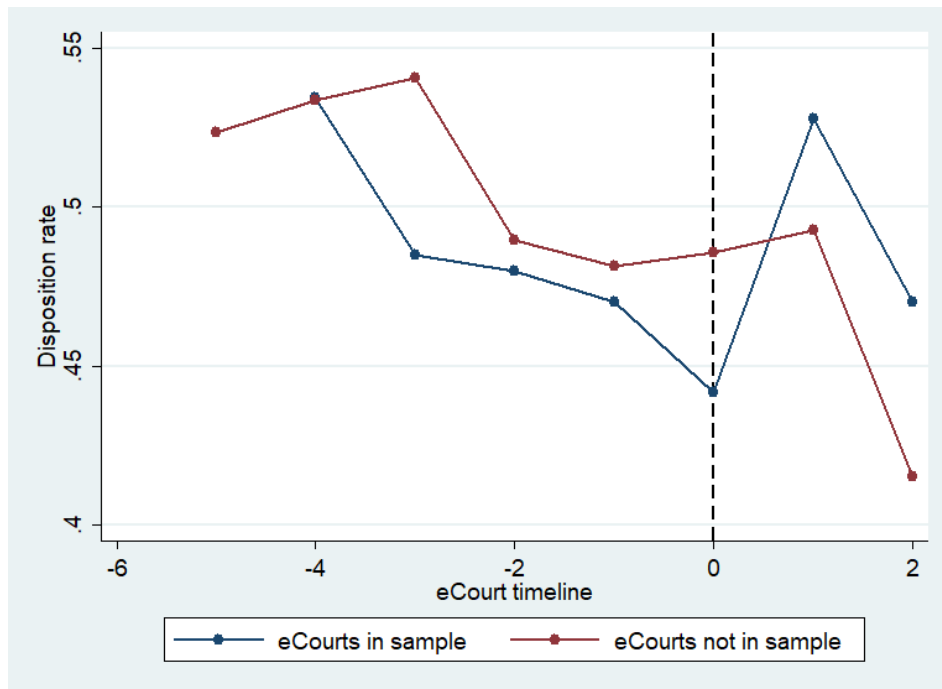
Notes: Standard errors in parentheses; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Pair fixed-effect not shown.

Appendix E shows court-level estimation results when court fixed-effects and court and year fixed-effects are considered.

#### **4.1.2 Case-level analysis**

The case-level analysis is limited by the number of court dockets fully digitized, resulting in only 116 court pairs. Figure 10 shows the disposition rate trend for eCourts in the case-level sample and for those not in the sample.

**Figure 10: Disposition rate of paired eCourts in and out of case-level samples**



To further establish the similarity of eCourts in and out of the case-level sample, we employ a similar methodology using clearance rate as the outcome. Table 11 shows the clearance rate trend for eCourts. To quantitatively test that the in-sample eCourts are not different from those that are excluded, we use a paired T-test. Table 11 shows that these subsets of eCourts are not significantly different in terms of change in annual disposition rate.

**Table 11: Paired T-test of disposition rates of eCourts**

Outcome	Obs	Not in sample		In sample		Difference		p-value
		Mean	Std. Err.	Mean	Std. Err.	Mean	Std. Err.	
Clearance rate	116	0.115	0.200	0.719	0.638	-0.605	0.523	0.30
Disposition rate	116	0.008	0.001	0.017	0.015	-0.009	0.013	0.52

Table 12 presents the number of cases filed and the mean case duration of sample cases for eCourts and non-eCourts within two years either side of the eCourt system's establishment. There is a noticeable increase in the number of cases filed in eCourts after the reform, part of which is associated with newly filed cases being prioritized in the process of migrating records to the new system. First level courts generally have fewer cases and shorter case durations than second level courts. Across courts, there also appears to be a decrease in the average time it takes to resolve a case, meaning there is a general downward trend in case duration, whether on eCourts or non-eCourts.



**Table 12: Number of cases filed and mean case duration, eCourt and non-eCourt**

	Within 2 years before eCourts		Within 2 years after eCourts	
	Number of cases filed	Mean case duration (days)	Number of cases filed	Mean case duration (days)
eCourts				
1st	10,625	552	36,927	221
2nd	20,253	741	53,261	378
Non-eCourts				
1st	3,314	279	3,743	151
2nd	33,626	629	35,387	303

Source: eCourts database and digitized dockets dataset.

Figure 11 presents the case-level trend of average case duration over time. There is a general downward movement from the time when there was no eCourt system up to the second year of its implementation. Courts with the eCourt system initially had a longer case duration, but this converged with the duration of their non-eCourt pairs at time 0.

**Figure 11: Trend of average case duration for eCourt and non-eCourt pairs.**

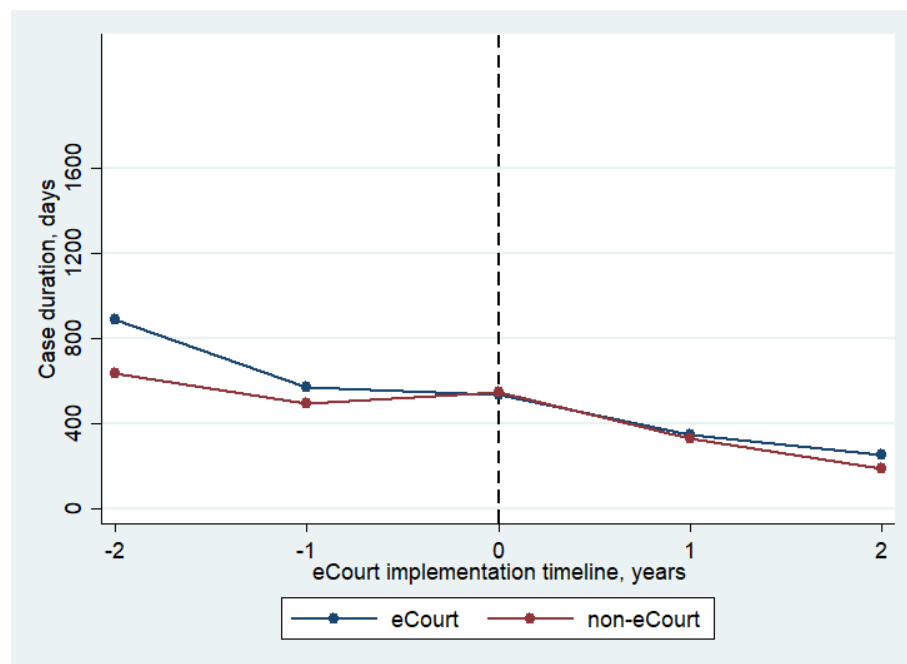


Table 13 shows the case-level impact of the eCourt system using case duration as the outcome. Within the first year of its implementation, the eCourt system had no significant effect on case duration. In its second year, it recorded an average 103 days reduction in case duration compared to cases resolved by non-eCourts. Adding year fixed-effects shortens the reduction to 97 days, but this estimate is highly significant.

**Table 13: Difference-in-differences in case duration**

VARIABLES	1 year: court-pair fixed-effects	1 year: court-pair and year fixed-effects	2 years: court-pair fixed-effects	2 years: court-pair and year fixed-effects
eCourt	4.545 (56.90)	22.01 (27.31)	138.7** (63.43)	114.7*** (25.50)
Post	-175.8*** (36.63)	-338.9*** (24.85)	-454.5*** (45.26)	-863.3*** (26.07)
eCourt X Post	-11.55 (41.03)	39.10 (24.96)	-103.1* (61.39)	-97.13*** (26.09)
Constant	536.1*** (47.92)	-473.4*** (52.68)	682.0*** (41.56)	-531.5*** (46.41)
Observations	35,680	35,680	24,172	24,172
R-squared	0.349	0.822	0.502	0.870

Notes: Standard errors clustered by court; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.  
Pair fixed-effect and court fixed-effect not shown.

The significant reduction in case duration that manifests within the second year of eCourt implementation signals that users have already adjusted to the nature of the reform. In addition, the significant impact on case duration but not on disposition and clearance rates implies that while the eCourt system made courts more efficient in case resolution, but the efficiency is offset by the volume of cases received by the courts resulting in statistically insignificant effects on case disposition and clearance rates.

Table 14 shows the impact of eCourt adoption on the proportion of cases disposed within 180 days. Results suggest that, using a one-year window, eCourts have a significantly higher proportion of cases disposed, with or without year fixed-effects. Similarly, the result is significantly positive using a two-year window for the estimation, with only court-pair fixed-effects.

**Table 14: Difference-in-differences in proportion of cases disposed in 180 days**

VARIABLES	1 year: court-pair fixed-effects	1 year: court-pair and year fixed-effects	2 years: court-pair fixed-effects	2 years: court-pair and year fixed-effects
eCourt	0.0300 (0.0186)	-0.0586 (0.0434)	-0.0357 (0.0217)	-0.0144 (0.0470)
Post	0.0139 (0.0143)	0.192*** (0.0359)	0.0395** (0.0166)	0.675*** (0.0642)
eCourt X Post	0.0481** (0.0207)	0.122*** (0.0414)	0.0918*** (0.0275)	-0.0639 (0.0728)
Constant	0.0644*** (0.0126)	1.222*** (0.0746)	0.0618*** (0.0105)	1.007*** (0.118)
Observations	109,452	35,680	87,684	24,172
R-squared	0.112	0.386	0.135	0.446

Notes: Standard errors clustered by court; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1.

Pair fixed-effect and court fixed-effect not shown.

The results are mixed for proportion of cases disposed in 360 days (Table 15). There is a significant decline of 0.155 percentage points for the estimation using the one-year time frame with year fixed-effects. However, there is a significant increase in the proportion of disposed cases for the two-year window without the year fixed-effects.

**Table 15: Difference-in-differences in proportion of cases disposed in 360 days**

VARIABLES	1 year: court-pair fixed-effects	1 year: court-pair and year fixed-effects	2 years: court-pair fixed-effects	2 years: court-pair and year fixed-effects
eCourt	0.105*** (0.0268)	0.0602 (0.0418)	-0.0417 (0.0328)	-0.109** (0.0441)
Post	0.0645*** (0.0209)	0.477*** (0.0399)	0.00209 (0.0216)	0.725*** (0.0572)
eCourt X Post	-0.0273 (0.0277)	-0.155*** (0.0428)	0.153*** (0.0392)	0.0830 (0.0667)
Constant	0.0933*** (0.0184)	1.449*** (0.0724)	0.114*** (0.0159)	1.467*** (0.0673)
Observations	109,452	35,680	87,684	24,172
R-squared	0.146	0.515	0.155	0.588

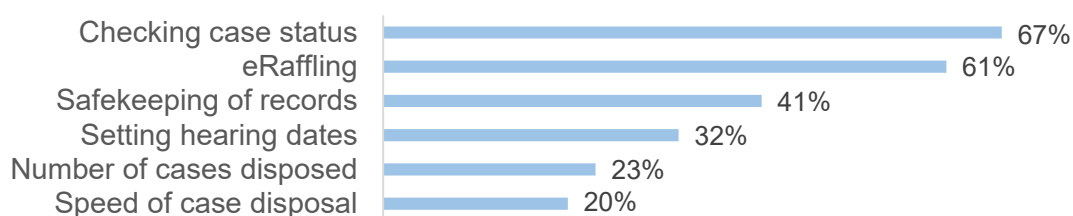
Notes: Standard errors clustered by court; \*\*\* p<0.01, \*\* p<0.05, \* p<0.1. Pair fixed-effect and court fixed-effect not shown.

Appendix E and Appendix F show additional estimation results when court-level covariates are added to the case-level analysis, and when court and year fixed-effects are considered.

## 4.2 Intervention implementation fidelity

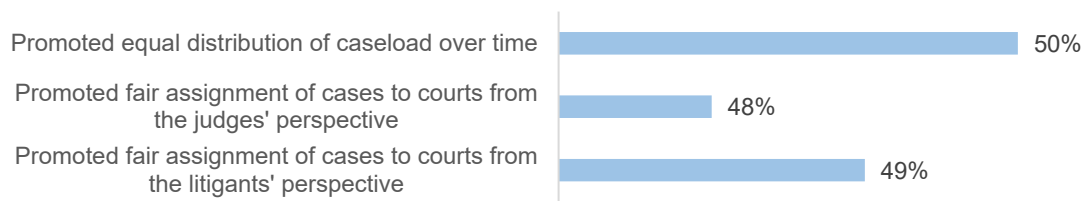
The qualitative interviews and online survey indicate largely positive feedback. Among eCourt users, 79% support its continued implementation, while 60% of non-eCourt personnel expressed a desire for the system to be installed in their courts. As shown in Figure 12, respondents referred to several benefits of the eCourt system, including checking of case status (67%), raffling of cases (61%), safekeeping of records (41%) and setting of hearing dates (32%). They also claimed that eCourt increases the number of cases disposed (23%) and speeds up case disposal (20%).

**Figure 12: Judicial functions benefitting from eCourt system**



Respondents pointed to several benefits of the e-raffling feature (Figure 13), including promoting equal distribution of cases over time (50%), and promoting fair assignment of cases from the perspective of judges (48%) and litigants (49%). However, we also find concerns regarding the fairness of case distribution, with some respondents perceiving that more cases are raffled to their courts when they dispose more cases.

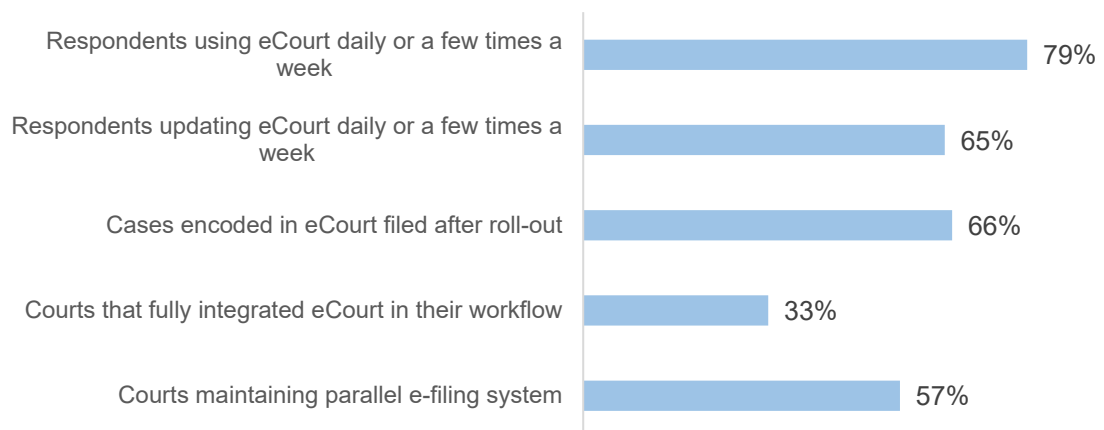
**Figure 13: Perceptions on the benefits of e-raffling**



Several issues were reported including insufficient infrastructure and equipment such as computers and server connections, inadequate training of court personnel and the lack of IT support, and a shortage of human resources to update and maintain the eCourt system.

Additionally, the survey highlights problems in the extent of the eCourt system's usage (Figure 14). Only 79% use eCourt daily or a few times a week, while 65% update eCourt daily or a few times a week. Furthermore, only 33% of respondents claim to have fully integrated eCourt into their workflow. On average, respondents estimated that encoding of cases filed before the eCourt rollout was completed in 66% of cases. There was no difference between judges and branch clerks of court in the reported frequency of use or updating.

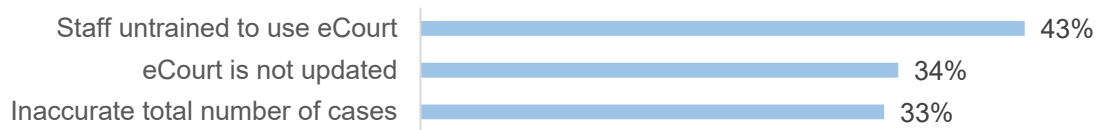
**Figure 14: Extent of usage of eCourt case management system**



The main reason cited as to why the eCourt system is not used as frequently as expected is courts not having encoded all active cases. Respondents reported being overwhelmed by existing caseloads taking up their full working day, leaving them unable to find time to encode cases in the system. Some courts coped with the workload by encoding gradually, dividing the task among staff – including the branch clerk of court – who sometimes even work on the weekends. Newly created eCourts, which have fewer pending cases, seem to have an easier time updating the system.

Figure 15 presents the top three challenges causing eCourt branches to create a parallel electronic filing system. Some described the parallel system as a self-developed Excel-based record, in which the basic case description and update case status is encoded. This record is used to generate monthly reports. For eCourts without a separate electronic record, manual logbooks continue to be maintained. These circumstances lead to work duplication and adds to the administrative burden faced by court staff.

**Figure 15: Reasons for maintaining a parallel case management system**



About 43% of respondents also mentioned that court staff are not trained in using the eCourt system. Respondents commonly stated that technical issues concerning the eCourt system are not usually resolved quickly, and that questions concerning how to properly fill fields or troubleshoot system errors are not immediately addressed due to inadequate training of court personnel using the system. The trainings conducted at the beginning of the rollout were only given to select members of the court branches, and many of these personnel are no longer with the courts. In addition, interviewees claimed that the SC's Management Information System Office could not address all the technical problems experienced by eCourt users as it is not the developer and implementer of the system.

The usefulness of eCourt also relies on court personnel being diligent in updating the system with case information for active cases, thereby reducing the time needed to look up a case status or contact information for prosecutors and lawyers. In non-eCourt areas, combing through physical records for such information can take up as much as two hours per day. However, an inaccurate tally of cases and eCourt not being updated are issues mentioned by, respectively, 33% and 34% of respondents. These issues relate to the encoding and updating of eCourt system fields, which are found to be burdensome in courts with high caseloads and inadequate human resources. Respondents estimated that only 66% of cases filed after rollout are encoded in the system. Providing encoding support at the beginning of eCourt rollout is highly encouraged to ensure system usability. On the other hand, even courts with fully updated eCourt systems claim that the tally of cases recorded in the system does not match the court dockets they prepare manually. Respondents mentioned that despite raising this issue with their respective Management Information System Office there seems to be no resolution available. Findings from the interviews suggest that the eCourt system needs improvements to ensure accuracy, simplify the encoding process and improve the interface. Only 11% of respondents reported having ever been consulted on the design of the eCourt system, and that many of the respondents expressed that they would like to be more involved in the process.

Respondents also noted that courts have limited use of the eCourt system due to a lack of infrastructure. In some instances, courts are placed in a temporary office and share court rooms with other branches. These courts also lack sufficient computers or existing internet and phone connections, which further limits their use of and access to the eCourt system. In one interview, it was mentioned that the court branches do not have an eCourt server in their building, so are only able to access it once a week.

Analysis of the relationship between eCourt rollout and court characteristics from monthly reports between January 2014 and December 2019 shows that the rollout came earlier for courts with a higher number of cases filed, reopened, received and pending (Table 16). In other words, congested courts were prioritized for early eCourt implementation.

**Table 16: Effect of court characteristics on eCourt rollout**

Dependent variable: month and year of rollout		
<i>Variable</i>	<i>Cases filed</i>	<i>R2 adj.</i>
Cases filed	-2.384***	0.001
Cases reopened	-8.515***	0.001
Cases received	-10.026***	0.001
Cases pending	-0.227***	0.003
Inflow of cases <sup>1</sup>	-2.272***	0.002
Caseload <sup>2</sup>	-0.211***	0.003

Notes: \*\*\*p<0.001.

<sup>1</sup> Total number of cases filed, reopened and received.

<sup>2</sup> Total number of cases pending and inflow.

To summarize, referring back to the assumptions underlying our theory of change,<sup>20</sup> it is clear that many courts did not have access to the basic infrastructure – such as computers, network connection and office space – needed to ensure that the eCourt system would be fully functional when rolled out (assumption 1). Many courts did not regularly update old and new cases (assumption 2). Courts maintained a parallel paper-based system rather than transitioning fully to the new system, suggesting that staff were not fully receptive of the eCourt system (assumption 3). Furthermore, staff were not sufficiently or regularly trained on the eCourt system (assumption 4). From the earlier impact analysis, it is also clear that inefficient case management is a cause of delay or resetting of trials (assumption 5). Prosecutors, the public attorney’s office and litigants benefit from eCourt in getting faster updates on cases (assumption 6). A stable justice environment exists (assumption 7), and there is an absence of negative external shocks (assumption 8).

## 5. Discussion

### 5.1 Findings

The eCourt system was established with the intention of upgrading select lower courts’ case management through leveraging technology and court automation. In addition to offering more efficient ways of recording and monitoring cases, by introducing electronic raffling the new system also aims to reduce potential misconduct arising in the manual raffle or assignment of cases.

Results at the court-level indicate that, using a two-year range from the date of the rollout, the eCourt system has no significant impact on the disposition or clearance rate. We find a statistically significant decrease in the clearance rate during the first year of implementation, alongside a significant decline in pending cases. Together these findings suggest that the primary impact of the eCourt system is on pending cases, and that its overall impact on these cases is small relative to case inflow.

<sup>20</sup> These were: (1) Courts have sufficient basic infrastructure, such as computers, network connection and office space, to ensure that the eCourt system is fully functioning when rolled out; (2) encoding and regular updating of old and new cases is completed; (3) staff are receptive to the eCourt system; (4) regular trainings and updates are given to both existing and new staff; (5) inefficient case management is a cause of delay or resetting of trials; (6) prosecutors, the public attorney’s office and litigants benefit from eCourt in getting faster updates on cases; (7) a stable justice environment exists; and (8) there is an absence of negative external shocks.

At the case level, there is no significant impact on case duration during the first year of implementation. However, the estimation results show that, in the second year, the average case duration registered for courts with the eCourt system is 103 days fewer than those without it.<sup>21</sup> Consistent with these findings, we see mixed evidence on the proportion of cases resolved in the first year, but largely positive impacts on the proportion of cases resolved by the end of the second year of implementation. The change of impact between the first and second year of implementation can be attributed to the transition time needed to set up and learn how to operate the system. This finding is echoed by clerks of courts and judges in the interviews conducted, who cited the encoding, training and adjusting needed, especially during the first months after rollout.

The seemingly contrasting court-level and case-level results can be explained by the nature of the efficiency outcomes. Case duration is measured using individual cases, with results showing that these cases are resolved faster. Meanwhile, the clearance rate measures the case outflow relative to case inflow, with pending cases used when measuring the disposition rate. Statistically insignificant differences between these outcomes do not necessarily mean a lower number of resolved cases – it can also imply that case inflow has increased. This is especially true in eCourt locations as they are among the most congested courts. Thus, efficiency gains at the case level are offset by increases in overall case load. In El Bialy's (2016) study of the Egyptian judiciary reform, computerization is identified as a factor leading to higher court efficiency. However, Economides, Haug and McIntyre (2013) point out that court size, case load and other court resources are crucial to overall court performance.

The qualitative interviews show positive feedback for eCourts in general. Even respondents without access to eCourt expressed interest in being included in the system. Nonetheless, we are able to identify three potential sources of low compliance in implementation that likely affect impact estimates: (1) most courts do not use and update the eCourt system daily, making it less useful for improving case management; (2) most courts use a parallel case management system, which overall may increase rather than reduce the administrative burden on judicial staff; and (3) eCourt upgrades are targeted first at congested urban courts – though these have high caseloads, they also potentially have better infrastructure and more skilled personnel. The first two are straightforward issues of low compliance that are likely dilute the intervention's impact. The third can go in either direction, with eCourt staff having to deal with higher case counts and workloads – thereby making it harder to adopt the new technology – while also likely being more tech-literate, leading to a potentially higher marginal impact of improved case management.

On balance, given our identification strategy matched on pre-trends in caseload, we think the issues of partial compliance are likely to dominate. This implies that our impact estimates represent the lower bounds of the eCourt system's potential impact.

## 5.2 Limitations

One of the evaluation's limitations arises from the difference in the data sources used at the case level. Only docket data for non-eCourts were digitized. Furthermore, the pre-intervention data for eCourts relied on back-encoded data in the eCourts database. We are aware that the quality of data has important implications for the estimates of effects.

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<sup>21</sup> It should be noted that this outcome is only marginally significant at the 10 per cent level.

We were also limited by the scanning of court dockets. We prioritized the scanning of dockets that were about to be disposed or requested by the SC's audit team, scanning as many as possible given that the SC has no other record of them.

There are also several factors in the reform's implementation that may have limited outcome gains. eCourt users reported problems concerning lack of computer equipment, server limitations, system design problems, inadequate training of personnel, inadequate human resources to encode and maintain eCourt, and lack of IT system support.

The eCourt system may also be limited by the inability of some eCourts to fully encode cases into the system. Respondents cited that overwhelming caseloads leave them no time to update the system. Newly created courts seem to have updated the system, while others have not been able to complete back-encoding of all cases. Another issue raised was the inaccuracy of reports generated. Even in courts with fully updated cases, the eCourt system generates reports that do not match the manual tally.

These limitations are why we highlight the court-level impact estimates, as the court-level reports are independent of the digitization process and the eCourt system, are more complete, and cover the entire court system.

### **5.3 Challenges and lessons**

In evaluating the eCourt system, the main challenge we faced was digitizing the comparison non-eCourt dockets. Hard copy inventory of semestral dockets sent to the SC by court branches had to be scanned and converted to usable Excel files for the case-level analysis. Scanning operations eventually extended to approximately 400,000 scanned pages. We then used various software programs to automate the conversion process. However, the varying quality of scans made it difficult to convert them all automatically. Hence, we created a workflow in which clear scans were converted using the appropriate software, while the others had to be hand-encoded. After digitization, the converted dockets still needed rigorous data cleaning to ensure the relevant variables were accurate and included. The whole process took more than a year to complete.

In addition, courts use varying naming conventions to encode the same information. There is also no common template for court docket reports and the available information is not completely reconcilable with the eCourt dataset. Considerable time was spent cleaning and creating consistent identifiers for each court branch and court case, matching them with their respective geographic location, and merging separate datasets for the analysis.

Given the sensitive nature of the evaluation, it is important to consider the timeframe for approval processes in the research design and timeline. Due to changes in leadership within the SC, IPA initially encountered delays in obtaining the necessary court en banc approval to proceed with the research study. The resolution for IPA's evaluation research was proposed in 2018 and only issued by the court en banc on 8 January 2019, and approved by Chief Justice Lucas PBersamin on 29 January (A.M. No. 16-03-05-SC).



## **6. Conclusions and recommendations**

### **6.1 For the Supreme Court**

#### **6.1.1 On eCourts**

The eCourt system has many useful features that have the potential to improve court efficiency. From a policy perspective, and not factoring in costs, we would stipulate that a fully implemented eCourt system is likely to be better than no eCourt system. The eCourt's automation features – such as electronic raffling and the digital recording of case information – contribute to better case management. These features are valued by judicial staff, as indicated in our online survey.

The eCourt system is most useful when it can harness technology to simplify tasks and eliminate unnecessary work. This is supported by the fewer number of days it takes to resolve a case in eCourts in the second year of implementation. However, referring back to the assumptions in our theory of change, to improve their operations courts need ample time to adjust and adapt to, and learn about, the technology. It is therefore important to equip courts with the necessary inputs at the onset of the reform. This means ensuring that court personnel are trained, detailed user-friendly manuals are provided, courts have the IT equipment and network connections needed, and that there are enough court personnel to take on the additional tasks required during the transition period.

The case-level results also emphasize the value of ongoing consultation with end-users on how the eCourt system can be tailored to better fit their needs. This applies not only to changing existing features but also to developing new ones. This kind of engagement may also increase support from stakeholders and help shorten the time it takes to adjust to changes after rollout. Furthermore, it is worthwhile producing a manual detailing how the eCourt system works and how to troubleshoot errors. This will minimize the need for external support, especially in addressing basic concerns.

We note that improvements in case-level efficiency can be offset by a rising influx of new cases. Thus, shorter case duration may be matched by an increased volume of case inflow, resulting in no significant change in a court's case load. This highlights the importance of providing courts with complementary human resources and infrastructure to address these additional requirements.

#### **6.1.2 On non-eCourts**

The policy goal of a digital management system covering all courts in various regions across the country requires immense resources that may not be available at this time. While, for various reasons, the eCourt system may not be feasible for certain courts, continuous monitoring of docket inventory reports is key to obtaining efficiency in outcomes. To facilitate monitoring and evaluation in non-eCourts, it would be beneficial to enforce a uniform format or template for docket inventory reports, which could include an established protocol on how to fill out the records. The eCourt system provides a model showing what data fields would be required in the templates. While potentially a rigorous process, accomplishing this could contribute to data-driven decision-making on improving court performance and efficiency in the context of a dynamic Philippine policy environment.

Ideally, court dockets should be digitized in some form for ease of monitoring, processing and production of reports, perhaps through an electronic submission being made to the SC alongside the signed paper submission. Furthermore, given many courts prepare the court dockets on computers, it would be useful to provide uniform templates compatible with open-source spreadsheet software, thereby establishing universal recording and workflow. If data is encoded as case information (rather than encoding only for the purpose of docket submission), simple automated dashboards can be created and included in the electronic spreadsheet. The court could then be provided with information in a form resembling some of the eCourt dashboard.

The data collected in the eCourt system, as well as in other systems, are useful in monitoring reform implementation and court performance, as well as in guiding decision-making at the level of the courts and the Office of the Court Administrator. Developing a learning agenda, facilitated by a monitoring and evaluation plan, can enable broader and sustained data use to guide implementation of eCourts and other reform measures. The benefits of data generation can only be fully revealed if it is consistently used to inform policy, implementation and learning.

## **6.2 For future studies**

Further research on the impact of the eCourt system would potentially be useful in understanding various outcomes, such as heterogeneity, take up, and complementarity with other justice reform programs.

1. Evaluating the heterogeneity of impact based on characteristics said to affect case resolution, such as existing caseload, or the characteristics of judges, as mentioned in the interviews with judges and clerks of courts, may contribute to better understanding of the effects of eCourts. Currently, our sample is limited, and precise estimates may not be possible for heterogeneity analysis or cost analysis. Expanding the study sample and data for analysis in order to gain a better understanding of the eCourt reform could further drive efficiency outcomes and optimize justice reform programs in the country.
2. A behavioral study to understand incentives or nudges for court personnel in terms of increasing usage and take up could provide essential insight regarding improving performance at a low cost.
3. Cost analysis of implementing the eCourt system in comparison with the traditional manual system, the Excel-based case tracking system used by some courts, or any new electronic case management system, could provide valuable insight regarding the aim of digitization.
4. Lastly, future research could be conducted to determine how eCourt implementation works in complementarity with other judicial reforms.

## **Online appendices**

### **Online appendix A: Matching results**

[www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC\\_.IE-eCourts-Online-appendix-A-Matching-results.pdf](http://www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC_.IE-eCourts-Online-appendix-A-Matching-results.pdf)

### **Online appendix B: FGD guide**

[www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC\\_.IE-eCourts-Online-appendix-B-FGD-Guide.pdf](http://www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC_.IE-eCourts-Online-appendix-B-FGD-Guide.pdf)

### **Online appendix C: Online survey**

[www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC\\_.IE-eCourts-Online-appendix-C-Online-Survey.pdf](http://www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC_.IE-eCourts-Online-appendix-C-Online-Survey.pdf)

### **Online appendix D: Pre-Analysis plan**

[www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC\\_.IE-eCourts-Online-appendix-D-Pre-Analysis-Plan.pdf](http://www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC_.IE-eCourts-Online-appendix-D-Pre-Analysis-Plan.pdf)

### **Online appendix E: Additional court-level estimations**

[www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC\\_.IE-eCourts-Online-appendix-E-Additional-court-level-estimations.pdf](http://www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC_.IE-eCourts-Online-appendix-E-Additional-court-level-estimations.pdf)

### **Online appendix F: Additional case-level estimations**

[www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC\\_.IE-eCourts-Online-appendix-F-Additional-case-level-estimations.pdf](http://www.3ieimpact.org/sites/default/files/2020-12/PWP.03.SC_.IE-eCourts-Online-appendix-F-Additional-case-level-estimations.pdf)

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