



Master's Thesis of Public Administration

The Impact of Caseload and Court size on Court Productivity in Mongolia

몽골의 법정생산성에 미치는 사건부하와 법정규모의 영향

February 2023

Graduate School of Public Administration Seoul National University Global Public Administration Major

Odmaa Dorjnamjim

The Impact of Caseload and Court size on Court Productivity in Mongolia

Academic Advisor Kim, Bong Hwan

Submitting a master's thesis of Public Administration

October 2022

Graduate School of Public Administration Seoul National University Global Public Administration Major

Odmaa Dorjnamjim

Confirming the master's thesis written by Odmaa Dorjnamjim

December 2022

Chair	Lee, Sooyoung	(Seal)
Vice Chair	Na, Chongmin	(Seal)
Examiner	Kim, Bong Hwan	(Seal)

Abstract

The Impact of Caseload and Court size on Court Productivity in Mongolia

Odmaa Dorjnamjim Global Public Administration Major The Graduate School of Public Administration Seoul National University

There is an ongoing debate on effective ways to improve quantitative court performance and the quality of court decisions. A frequent policy assumption regarding judicial efficiency is that more judicial staffing could be more productive and could increase the court output. However, some theoretical views and recent empirical studies have doubted this presumption.

This study is dedicated to understanding determinants of court productivity. Firstly, the impacts of caseload and the number of judges were examined to explain court productivity. Secondly, the study investigated the impact of the volume of resolved cases on the quality of court decisions.

The random and fixed effect regression analyses were conducted by collecting reliable secondary data from the competent judicial administration in Mongolia. Based on the common practice of related previous studies and data available, the number of resolved cases and the clearance rate were selected as the indicators for the court performance, and the number of court decisions that had been reversed or changed by higher courts was used to determine the quality of court decisions. Research hypotheses and interpretation of the findings were based upon the rational choice theory explaining judicial behavior.

In the case of the Mongolian Judiciary, it was found that (1) the number of judges at a courthouse has no positive influence on the level of resolved cases or the clearance rate. Even it affects negatively the clearance rate; (2) By contrast, demand for court service is a key determinant of case dispositions, meaning that caseload pressure increases court output; (3) The quality of the court decisions is not correlated with the number of the cases resolved in the given period. Interestingly, caseload per judge even negatively affects the quality of the decisions. In general, it is concluded that a judge's productivity is endogenous. Whereas an increase in the number of judges does not increase court productivity, the more caseload courts have, the more effort judges make, thereby increasing court productivity.

Keywords: Caseload; Number of the judges; Number of resolved cases; Quality of judicial decisions;

Student Number: 2020-29766

ii

Table of Contents

Abstracti
List of Tablesvi
List of Figures vii
Chapter 1. Introduction1
1.1. Study Background1
1.2. Overview of the Judicial System in Mongolia4
1.3. Statement of the Problem and Purpose of Research7
1.4. The Significance of Research13
1.5. The Outline of Study14
Chapter 2. Literature Review15
2.1. The Determinants of Judicial Efficiency and Its Measurements15
2.2. Theoretical Framework
2.3. The Relationship between Court Output and the Number of the Judges
2.4. The Relationship between Court Output and the Caseload22
2.5. The Relationship between Court Output and the Quality of Court Decision
2.6. Micro Judicial-Behavior Level25
2.7. Hypotheses Formulation
Chapter 3. Research Method
3.1. Research Framework

3.2. Variables	32
3.3. Measurements for Independent Variables	33
3.3.1. Measurement for Demand for Court Service	34
3.3.2. Measurement for Court Size	34
3.4. Measurements for Dependent Variables	34
3.4.1. Measurement for Quality of Court Decision	35
3.4.2. Measurement for Court Productivity	35
3.4.3. Measurement for Court Output	36
3.5. Data Gathering	39
3.6. Data Analysis	42
Chapter 4. Data Analysis and Results	44
4.1. Descriptive Statistics	44
4.1. Descriptive Statistics4.1.1. Descriptive Statistics for Dependent Variables	44 47
 4.1. Descriptive Statistics 4.1.1. Descriptive Statistics for Dependent Variables 4.1.2. Descriptive Statistics for Independent Variables 	44 47 49
 4.1. Descriptive Statistics 4.1.1. Descriptive Statistics for Dependent Variables 4.1.2. Descriptive Statistics for Independent Variables 4.1.3. Changes over time in Independent and Dependent Variables. 	44 47 49 53
 4.1. Descriptive Statistics	44 47 49 53 59
 4.1. Descriptive Statistics 4.1.1. Descriptive Statistics for Dependent Variables 4.1.2. Descriptive Statistics for Independent Variables 4.1.3. Changes over time in Independent and Dependent Variables. 4.2. The Hausman Test 4.3. Hypotheses Test 	44 47 49 53 59 60
 4.1. Descriptive Statistics	44 47 53 59 60 66
 4.1. Descriptive Statistics	44 47 53 59 60 66 70
 4.1. Descriptive Statistics 4.1.1. Descriptive Statistics for Dependent Variables 4.1.2. Descriptive Statistics for Independent Variables 4.1.3. Changes over time in Independent and Dependent Variables. 4.2. The Hausman Test 4.3. Hypotheses Test 4.4. Discussion Chapter 5. Conclusion and Policy Recommendation 	44 47 53 59 60 66 70
 4.1. Descriptive Statistics	44 47 53 59 60 66 70 72

Bibliography	75
Appendix	86
Abstract in Korean	87
Acknowledgment	89

List of Tables

Table 1. Court system in Mongolia
Table 2. Judicial budget, case resolutions, and the proportion of existing
judges in Mongolia (2015-2020)6
Table 3. The operationalization and measurement for each variable
Table 4. Observations for phase 1 and phase 241
Table 5A. Summary Statistics for Local Courts
Table 5B. Summary Statistics for District Courts
Table 6A. Change over time in Variables for Local Courts
Table 6B. Change over time in Variables for District Courts
Table 7. The results of the Hausman test
Table 8. Regression results - Fixed effects (1)
Table 9. Regression results - Random effect (2)63
Table 10. Regression results - Random effect (3)64
Table 11. Summary of Hypotheses Test 65

List of Figures

Figure 1. Approved courts' budget per category of expenses in the European
States in 20189
Figure 2. Number of judges per 100 000 population in the European States,
2010 – 201811
Figure 3. Research Framework
Figure 4. Systems approach
Figure 5. The average number of filed cases, resolved cases, and serving
judges in Mongolia, 2015-202056
Figure 6. The average number of caseloads per judge and reversal ratio in
Mongolia, 2016-2020
Figure 7. Scatter Plots of independent vs. dependent variables

Chapter 1. Introduction

1.1. Study Background

After North's seminal book (1990) which describes the impact of institutions and institutional transformation on economic performance, there is a growing consensus that a well-functioning market system and economic growth rely significantly upon legal institutions, particularly the judicial sector. It means that the judiciary plays an important role in countries' development ensuring legal egalitarianism and law enforcement as well as protecting economic rights and contracts. Since then, not only have various judicial reforms funded by international agencies and governments been initiated to improve the functioning of the courts but also many empirical studies have been aimed to assess judicial performance and identify the main factors affecting negatively or positively justice effectiveness all over the world.

Along with these reforms to improve the judiciary, the lack of public resources remains the main concern in developing countries. Humans need many investments to live better, but in the end, we are subject to our limited resources. Particularly, in the era of Covid19, countries have faced an economic crisis and urgent spending on other public sectors, including health and education. On the other hand, total public expenditure across the world has been growing rapidly over the years, which has been widely criticized. It is predicted that public spending will reach 50 percent of total GDP during the Covid19 crisis. Therefore, it is important to know how to enhance the public sector performance at a lower cost, and smart and efficient public expenditure would be a key target for government activities.

Another challenge for the judiciary is the measurement of judicial performance. Even though there is no consensus on how to measure the overall performance of the justice system, some common aspects are used. For example, dimensions suggested by Staats, Bowler, Hiskey (2005, p. 77) and the National Center for State Courts (Albers, 2011, p. 2) are (1) independence, (2) efficiency and timeliness, (3) access to judiciary, (4) accountability and public confidence as well as (5) the ability to enforce court decisions.

Among these dimensions of judicial performance, this paper is more relevant to the judicial efficiency context, which involves the acceleration of the judicial decision-making process and problems of unreasonable delays or case backlogs. The reason that judicial efficiency has been on the agenda in many countries for years is that case congestion and the inability to dispose of cases in a reasonable time not only leads to a loss of public trust in justice systems but also negatively influences economic development.

Nevertheless, it is criticized that the government is concentrating on the court productivity and court efficiency aspects only, and the quality of court service is often neglected. Fundamentally, people who go to court usually emphasize the court's speed and quality. If the service and product offered by a public organization, especially the judicial sector, is not well performed, users could go elsewhere. So "fast" and "high quality" are the most important traits of judiciaries. Consequently, the quality aspect of court decisions is also not left out in this research.

Although, in fact, judges are often reluctant to let anyone evaluate their work

due to the feature of judicial independence, this pattern has been changing in recent years. Judges must make decisions without any other intervention from authorities. At the same time, court performance has to be assessed since courts are subsidized by public means. Furthermore, the New Public Management approach has been affecting public administrations in many countries since the 1980s (Viapiana, 2018). This new kind of managerial paradigm introduced the application of cost control, performance measurement, and management strategy to public sectors from the private sector. It managed to push courts to pay attention to measuring their performance for further efficiency improvements. Meantime, this approach is criticized that performance evaluation is not appropriate to the professional environment, such as judiciaries, because firstly, there is no common understanding of what the most accurate performance indicator is, and secondly, judiciary independence is threatened by this managerial approach (Viapiana, 2018).

In general, evaluations of judicial performance in most European nations are likely to focus on efficiency issues because of the increasing caseload and judicial bureaucracy. Also, international organizations, namely World Bank and the European Union, are paying attention to this worldwide difficulty as well, pushing to take action to address the backlog crisis and promote the efficiency of judiciaries (Marciano et al., 2019; Henisz, 2000; Weder, 1995). Some countries, including Italy, France, and Finland, have been developing performance-based budgeting systems identified by the performance objectives intended for enhancing efficiency. For instance, any request for extra budget from departments has to be related to growth in output and outcome. (World Bank, 2008). Some nations try to improve judicial efficiency through an increase in budget, the number of staff, and advancements in technology and facilities. For example, Ukraine demonstrates a great increase in the budget allocated to the judiciaries, and growing salaries of office staff and judges, while Cyprus invested more in court ICT. Last but not least, changing norms and judicial procedures are considered another strategy to deal with the caseload crisis.

As economy develops, demand for court service has increased constantly in Mongolia in recent years, and there is a controversy surrounding successful ways to improve court performance. Particularly, there is no consensus on whether additional appointments of judges could affect court efficiency and effectiveness. Yet, no empirical studies have been conducted in this regard.

1.2. Overview of the Judicial System in Mongolia

Mongolia is a civil law jurisdiction in which courts generally resolve cases according to codal provisions on a case-by-case basis without consideration of previous judicial decisions, or court precedents, in principle. The justice system in Mongolia is three-tiered: the first instance, appellate, and the Supreme court. The Judicial General Council (JGC) administers judiciaries in general, and this organization is in charge of resource and personnel management. It has broad authority and exercises or participates in almost all matters related to the powers of the judiciary.

Court specializations are classified into civil, criminal, and administrative. Mongolia is divided into 21 provinces (*aimag* in Mongolian) and the capital Ulaanbaatar which is subdivided into 8 districts. There are first instance courts for civil, criminal, and administrative cases in each province and each district. In the case of appellate courts, each province has an appellate court for civil and criminal cases, but there is only one appellate court for administrative cases in Mongolia, which is located in the capital Ulaanbaatar. Each district has not an appellate court, and there is one appellate court for civil and criminal cases in charge of all district courts in the capital city. According to Law on the Establishing Courts in Mongolia (2015), the judicial system in Mongolia is construed as follows: 80 first instance courts composed of 17 district courts and 63 local courts, and 24 appellate courts composed of 21 local courts and 3 district courts, and the Supreme court consisting of three Chambers.

 Table 1. Court system in Mongolia. Source: Author



The transition from communism to a democratic state and a free market economy in Mongolia started in 1990, and it has required the justice system to adapt to radical changes in political, economic, and societal sectors. Particularly, there was a need for law enforcement for the market to prosper. A large number of judicial reforms, such as the Legal Reform Program in 1998, the Strategic Plan for the Justice System of Mongolia in 2000, the Program to Deepen Judicial Reform in 2010, and the Strategic Plan in 2020, has been adopted and implemented systematically over times. These reforms highlighted the need for economic, political, and decision-making independence in the judicial system as the most essential value. As Strategy Plan (2020) has mentioned that thanks to legal reforms, many improvements have been made: the governance structure of the courts was transformed; case management, judges' economic guarantee, and human resource management were improved, and so forth (p. 1).

Despite the significant changes in the justice sector, courts are still struggling to deal with many challenges in Mongolia, such as large backlogs, court delays, and lack of resources. Furthermore, public confidence in the courts remains low and the capacities and fairness of the justice system are often criticized. Mongolians perceive there is a high level of corruption in the courts. In recent years, the Judicial General Council has been giving attention to increasing the number of judges to address these issues. Also, the demand for court service and court output is increasing year by year persistently. For example, in 2020, the total number of resolved cases increased by 50 percent compared to 2015.

Table 2. Judicial budget, case resolutions, and the proportion of existing judges in Mongolia.

Voor	Budget (in	Total case	Total number of
rear	tugrugs)	disposition	serving judges
2020	56.3 billion	89635	518
2019	51.1 billion	76969	505
2018	48.6 billion	62344	503
2017	50.8 billion	66317	511

2016	48.9 billion	53715	496
2015	52.1 billion	48869	491

Source: Annual Judicial reports in Mongolia (2015-2020)

In Mongolia, if the level of cases newly filed increases, the caseload of judges increases, so the court administration is unable to control the workload of judges. Judges must resolve their cases within the time limits set by law. The period of proceedings may also be extended for certain reasons.

Judges have a fixed salary, and the number and quality of cases resolved do not affect the amount of salary. The salaries of judges serving in higher courts are higher than in lower courts. Judges who have worked for many years also receive an additional salary. The total number of judges is approved by Parliament based on a recommendation of the Judicial General Council.

1.3. Statements of the Problem and Purpose of Research

There is an ongoing debate on the issue of justice budget and efficiency in Mongolia. Even though judicial financial security is one of the essential conditions to ensure judicial independence and improvements in court performance, courts have mostly insufficient budget allocation due to limited public resources. The economic crisis of Covid19 has escalated this situation. Specifically, not only court administrations are confronting many challenges surrounding the judicial system but also they are trying to advance the functioning of the judiciary in a costeffective way.

The main complaint of citizens and lawyers is the fact that the time required

for judicial service is excessive, and people are likely to avoid using the courts because of this difficulty. In these problems of backlogs and unreasonable delay, judges and staff of the courts blame the inadequate number of personnel, and they argue that the lack of judges inhibits improvements in judicial productivity. Therefore, many in the judiciary demand an increase in judicial staffing.

JGC investigated difficulties around judicial efficiency in Mongolia by conducting a survey among judges in 2018. As reported by a survey (Jamiyanjav, 2018), roughly 50 percent of judges mentioned that existing judges are insufficient to deal with the in-flow caseload. Approximately 20 percent of judges said that characteristics of the Mongolian procedural law cause a delay in case resolution because judges do not follow precedents, and they evaluate all arguments of the parties in each case although similar cases have been resolved.

However, some political authorities raise the question of producing the maximum quantity of output at the minimum cost of inputs, suggesting instead that there is room for efficiency improvement in the courts themselves. Opponents of increasing court budgets and the number of public officials argue that maximizing their size is the feature of every organization, and consideration of other causes leading to judicial inefficiency is important.

To some extent, this controversy is relevant to the fact that the weighted caseload system used to assess the judicial workload and to determine how many judges they need in particular jurisdictions has not been introduced in Mongolia yet. Although the number of judges at all levels of courts must be sufficient to exercise judicial power according to the Law on Mongolian Judiciary, it is unclear how to identify a sufficient number of judges. Thus, the question of the grounds for approving the number of judges is uncertain as well. In practice, authorities, including JGC and Parliament, are opening new positions or eliminating vacancies by exercising their discretion due to the lack of a weighted caseload system.

Logically, the more judges there are, the more cases are resolved. However, the increase in the number of judge positions requires a huge amount of funding for their long-term high salaries and pensions in addition to other expenditures for offices, training, and facilities. For instance, Figure 1 shows components of court expenses in European member states in 2018. On average, 65% of the fund dedicated to the courts is allocated to wages.

Figure 1. Approved courts' budget per category of expenses in the European States in 2018.



Source: European Judicial system Evaluation Report

Instead, there may be many alternative factors that affect court output volume and court quality level more strongly, such as judges' education level, experience, legal reasoning skills or flagging professionalism, and the responsibility system among judges. Moreover, large backlogs could also be caused by other external influences, including contradictory legislation, inconsistent instruction of higher courts, lack of legal research base, or access to relevant material, such as commentaries and high quality, peer-reviewed legal articles (Gramskow & Allen, 2011, p. 11). Even further, supplementary investments in hearing spaces and sophisticated technology (such as powerful computers) or software that is playing an important role to speed up the judicial process nowadays may be more effective measures to increase judges' productivity and the quality of decisions they produce. Besides, from the managerial perspective, some of these factors could be addressed by the effective management of serving resources instead of a preference for new recruitments (Dakolias, 1999).

For the reasons stated above, there is a need for empirical studies to find out the main determinants of court productivity. However, justice sector performance is highly complicated to evaluate, and there are many other factors affecting court activity. Due to data limitations, the research focused only on the proportion of judges and caseload.

In Mongolia, demand for court service is rising constantly during the last decade, and expansion of human resource capacity is becoming a preferred solution for this increasing caseload and poor court performance. For example, Parliament approved a total of 705 judges in 2016 to improve court productivity and quality of decisions (Law on Establishing courts, 2016). However, the volume of serving judges in all courts has not increased yet as planned because of the lack of resources. Currently, a total of 518 judges are working. The volume of serving judges in some courts rose and in others, even it decreased due to retirement, taking leave, or transferring to another court while trying to appoint new judges.

Currently, the quantity of serving judges is close to the mean of nations in the EU, using an indicator commonly applied in Europe. (518 judges for a 3 million population equates to roughly 16 judges per 100,000 inhabitants) (CEPEJ, 2020, p. 45) (Figure 2). Most European States have between 10 and 30 judges per 100 000 inhabitants as reported in the European Judicial systems CEPEJ Evaluation Report, and interestingly, even in the States of similar income and size, the number of judges varies greatly.

Figure 2. The number of judges per 100 000 population in the European States, 2010 - 2018.



Source: European Judicial system Evaluation Report

Over the past few years, the level of resolved cases each year has also increased as the number of newly filed cases has risen in Mongolia. However, there are cases when the number of incoming cases increases, but it does not influence court productivity because of excessive caseload pressure in some countries.

Thus, it is important to find out whether the growth in the number of case dispositions results from the new judge appointments or the increasing caseload, and whether the potential capacity of judges to resolve cases is exceeded in Mongolia in order to adopt effective and cost-effective policy for enhancement of court performance and successful management for increasing caseloads.

Even further, there is a question of whether two aspects of "to work more" and " to work better" go in the same direction. That's to say, good numbers do not translate into good performance. Judges may be compelled to work harder but they may not work smarter because quantitative evaluation is easier to assess and more visible than quality. For these reasons, we include the second phase of analysis investigating the correlation between the quality of court decisions and court output.

To conclude, the objective of this research is to study (1) the impact of caseload on court output and productivity, (2) the impact of the quantity of serving judges on court output and productivity (3) the impact of court output and caseload per judge on excellence of court decisions. The different volumes of caseload could differently influence the size of court output and productivity, and the extent of its effect is crucial for policymakers to balance the tasks at hand appropriately for the productivity maximization of judges. Also, investigating whether multiplying the number of judges can increase judicial output and productivity is needed to further the decision-making on human resource capacity. Apart from that, it is indispensable to examine if the acceleration of the court proceedings gets the quality of court ruling poorer.

Three research questions are developed, which are: (1) *How does the volume* of serving judges affect the total court output and productivity? (2) How does increasing caseload affect the court output and productivity? (3) How does the number of case dispositions affect the quality of their decisions?

1.4. The Significance of Research

This research attempts to overcome the limitations of some previous studies about court efficiency extending the scope of the court level and court specialization. The data applied in the study allows us to analyze different kinds of cases (administrative, civil, and criminal courts) at different levels.

The second contribution to the existing literature is the investigation of whether the quality of adjudication varies according to the court's output. Relatively few studies have studied court output and court decision quality aspects at the same time.

Last but not least, in addition to examining how the caseload volume and court size influence court output, it also examines how it affects court productivity, which is the clearance rate.

The result of the study allows us to obtain useful evidence for judicial policymaking. Particularly, it will help to rationalize the distribution of judicial budget, identifying the impact of human resource inputs and caseload on court output and productivity. If having more judges reduces the backlogs, thereby increasing judicial efficiency, then appointing more judges would be suggested as an important element of judicial reform. The results offer managerial implications and recommendations for court decision-making.

1.5. The Outline of Study

This study is written in 5 chapters. Chapter 1 introduces the study background,

statement of the problem, research questions, purpose as well as research significance. Chapter 2 is about the Literature Review consisting of theoretical approaches, existing studies around judicial efficiency and its determinants, and research hypotheses. Chapter 3 discusses the research framework, measurement, data collection, and methodology. Chapter 4 presents Data Analysis and Results, and it highlights the main findings, which are divided into descriptive statistics, hypothesis testing, and discussion. Chapter 5 concludes the research, while also providing policy recommendations for future improvement in court efficiency.

Chapter 2. Literature Review

The Literature review begins with general judicial efficiency issues, its determinants, and measurement, and continued with the theoretical framework. Then, previous studies related to each research question and hypotheses formulated based on them are shown.

2.1. The Determinants of Judicial Efficiency and Its Measurements

Researchers examine judicial efficiency to evaluate court performances as well as find its determinants. They have proposed several different measurements:

- the duration of the proceedings (Mitsopoulos & Pelagidis, 2007; Christensen & Szmer, 2012),
- the number of resolved cases (Beenstock & Haitovsky, 2004; Ramseyer, 2012),
- technical efficiency scores (Falavigna et al., 2015),
- clearance rates (Soares & Sviatschi, 2010; Ippoliti &Tria, 2020; Yeung & Azevedo, 2011),
- cost per case (e.g., NCSC in the US as cited in Albers, 2011, p. 9),

Some studies applied simple regression models (Beenstock & Haitovsky, 2004), while more complex analysis techniques, such as DEA (Schneider, 2005; Yeung, 2020) and Malmquist indexes (Falavigna et al., 2017) were employed in some analyses.

The clearance rate indicates how courts are coping with incoming lawsuits,

and it is derived by dividing the number of cases completed by the number of received cases. The *length of proceedings* is the duration of the judicial process (Ng et al., 2020). As stated by the National Center for State Court in the US, the efficiency of case disposition implies that resources are used in their most productive way, and they measure judicial efficiency using *cost per case* measurement.

Input selections and output definitions in previous studies are various. Whereas judges and administration staff have been considered as inputs by some authors, including Pedraja-Chaparro and Salinas-Jimenez (1996), some researchers, for example, Schneider (2005) and Ippoliti (2015) have used pending or incoming cases as inputs, arguing that the caseload may influence judicial performance.

According to the current review of literature, the number of resolved cases is the most prevalent output (Deyneli, 2012; Castro et al., 2015; Peyrache & Zago, 2016). Nevertheless, there are several studies using clearance rate (Yeung & Azevedo, 2011; Ippoliti & Tria, 2020), some types of judgments, such as adjudicated on merits, summary judgment, or dismissal (Engel & Weinshall, 2020), the number of sentences in a judgment and the number of hearings held (Gomes et al., 2017) as output.

Among studies examining determinants of judicial efficiency, there are three common prepositions (Djankov et al., 2003). Firstly, the development proposition argues that a costly justice system has a high level of efficiency. Secondly, the incentive proposition states that judicial efficiency is determined by the behavior of judges who are driven largely by incentives. The third one claims that complicated

procedural law negatively affects court performance. These propositions have been tested by many studies across countries. For example,

In most cases, the high salaries of judges coincide with their promotion due to the hierarchical position feature of justice, and there are several findings showing an increase in salary and career incentives influence judge's behavior positively and make them more efficient (Deyneli, 2011; Shapiro, 1981; Melcarne & Ramello, 2015). Some authors, for instance, Yeung (2020) found that procedural rules cause inefficient courts. With regards to development theory, Voigt and El-Bialy (2016) and Fauvrelle and Almeida (2018) showed that there is no relationship between resolution rates or clearance rates and GDP per capita. Moreover, their research result revealed that there is no tendency that a large amount of budget improves judicial efficiency. It has been asserted by the study conducted by Buscaglia and Ulen (1997) as well. In other words, poor countries can show good judicial performance, and a higher budget does not always bring high court productivity.

In addition to these three common propositions about judicial efficiency, researchers raise other factors to impact court performance. For instance, while Gorman and Ruggiero (2009) showed judicial specialization (administrative court, commercial court, etc.) as a major cause of justice inefficiency, others say that judicial poor performance results from a lack of training for staff and judges (Voigt & El-Bialy, 2016) or their low academic level (Dimitrova-Grajzl et al., 2012). Besides, few studies (Ferro et al., 2018; Bhattacharya & Smyth, 2001) have investigated the correlation between court productivity and the age of judges. Some of them concluded that when judges get older, they perform poorly, which leads to judicial inefficiency.

Overall, the review of the literature indicates that numerous papers have investigated the factors of court efficiency from diverse viewpoints, using different measurements. However, they have not reached a consistent conclusion yet.

2.2. Theoretical Framework

There are two distinct theoretical approaches to caseload crisis: judicial and managerial (Engel & Weinshall, 2020). The judicial approach is common among judges who believe that the court is a unique institution, responsible for providing justice. On the contrary, the managerial approach views justice as a service provider. These different views are relevant to different perceptions about the root of the caseload crisis and justice inefficiency.

The judicial approach spread to overcome a huge backlog problem in the U.S. in 1960 (Carrington, 1969). This approach claims that the court inefficiency stems from social and legal developments that produce a growing quantity of cases and more complicated cases. In this interpretation, more judges and judicial staff should be recruited to improvement in judicial performance (Stras & Pettigrew, 2010; Richman & Reynolds, 2012; Adler, 2014;).

The managerial approach developed in 1970 (Nagel et al., 1978) and suggests that the judicial congestion problem is the consequence of courts' mismanagement, inefficiency, and passiveness (Dalton et al., 2014; Mitsopoulos & Pelagidis, 2010). Therefore, an increase in judicial spending or recruitment of additional judges is not accepted as the most effective measure according to this approach (Webber, 2006; Heaton & Helland, 2011).

The managerial approach is consistent with a rational choice theory explaining a judge's behavior. The rational choice theory argues that judges are individuals inspired to maximize their utility function. This view was used originally by Posner and Cooter (1993). After that, Beenstock and Haitovsky examined the correlation between judicial new appointments and court output volume in 2004. They supposed that judges (1) always try to maximize their benefit and (2) spare time, therefore, avoid making lots of effort necessary to adjudicate disputes. Moreover, judges (3) shun case congestion since heavy backlogs might undermine their prestige and the likelihood of promotion and incentives. In this way, the primary framework behind Beenstock and Haitovsky's model is the equilibrium between working hard, thereby increasing resolved cases, or expediting case adjudication and work less, thereby diminishing quality of court decisions and jeopardizing judicial efficiency' (Jonski & Mankowski, 2014). Finally, the model leads to the conclusion that a judge's quantitative performance boosts as the caseload rises since judges do not want to have a bad reputation and that there is no relevance between the number of existing judges and a judiciary's ability to manage its workload because serving a judge's productivity decreases due to their preference for leisure.

In this theory, it is debatable whether judges sacrifice their interest in leisure or the quality of judgments for the high quantity of performance.

2.3. The Relationship between Court Output and the Number of Judges

The question of whether the quantity of jurists is relevant to the court

efficiency is controversial theoretically as well as empirically. On the one hand, we believe a positive relationship between the volume of judges and case dispositions is because the more staff work simultaneously, the more output can be produced. On the other hand, the amount of case resolution is not determined by the number of judges as stated in rational choice theory.

Beenstock and Haitovsky (2004) studied a judge's behavior in Israeli and found that judges complete greater cases under heavy caseload, and judges resolve fewer cases once additional judges are hired. Also, Dimitrova-Grajzl et al., (2012) and Voigt and El-Bialy (2015) did not uncover a significant association between court size and court output in European countries. Even Castro (2009) showed that court output per judge is negatively correlated to the number of judges in a judiciary. Furthermore, this study reveals that case resolution duration becomes longer with the increase in judicial size, and judicial efficiency improves when its infrastructure grows.

There are also more case studies showing that the new judges' appointments do not bring a positive effect on judicial efficiency. For example, Bulgaria increased judicial personnel expenditure for the high ratio of judges from 2004 to 2006. However, the average number of dispositions per judge was reduced by 7 percent despite the decrease in average caseload per judge (World bank, 2008). In other words, this policy did not improve overall court productivity in Bulgaria, even in some areas it has deteriorated. Similarly, Yeung (2014) found that the low quantity of the workforce is not the ground for inefficiency in Brazilian courts. This study asserted that court delay does not decrease with the increase in the volume of judges. However, several empirical studies took the side of the judicial approach, criticizing Beenstock and Haitovsky's study methodology as well as findings in recent years. For instance, Jonski and Mankowski (2014) argue that an improvement in judicial productivity does not result from an increase in the number of judges because judges are likely to refine the quality of their decision if they have more time. They also pointed out time constraints encountered by judges and lack of human resources, and suggest that additional staff is demanded to deal with increasing cases (p. 70). Moreover, Gomes's (2016) findings indicated that an increase in court officers boosts judicial productivity, utilizing the study methodology proposed by Jonski and Mankowski. Studies for Poland and Portuguese courts have shown identical results. (Schwengber & Sousa, 2005; Santos & Amado, 2014; Bełdowski, Dąbroś & Wojciechowski, 2020).

In addition, Dakolias (1999) revealed that developed nations are more competent in managing their justice system than underdeveloped nations. In his findings, the more judges serve for every million population, the greater the resolution rate, the lower backlog, and the lesser workload per judge in developed nations compared with courts in less developed nations. The study contrasted the clearance rate of Singapore and the US. The U.S. has a quite larger number of judges, and its clearance rate is roughly 98%, whereas Singapore shows excellent clearance rates of 94% with a small number of judges. This result indicates that not only do countries around the world vary regarding the main determinant leading achievement of judicial efficiency but also a combination of many factors could increase court performance. Accordingly, many analysts examine the effect of other determinants, including managerial structure, public budget on the judiciary, the

21

education of judges, the number of other workers, and hi-tech devices.

2.4. The Relationship between Court Output and the Caseload

We now go on to demand determinants. Proponents of the endogenous efficiency of judges contend that a large pile of pending cases is a stimulus to increase a judge's productivity. For instance, several studies found that the amount of caseload influences positively court output. (Luskin & Luskin, 1986; Castro et al., 2014; El-Bialy, 2011).

While Dimitrova-Grajzl et al., (2016) revealed that a ten-percent increase in the incoming cases increased case resolution to that extent /of 10%/ in Bulgaria, Rosales-Lopez (2008) presented that a ten-percent increase in caseload brought a three-percent growth in judicial productivity in Spain (p. 241). Although Gomes et al., (2017) found a significant correlation between caseload on the court docket and judge's performance, they highlighted that the robustness of this relationship hinges on the specialization of courts. Also, the result showed that the number of office staff in a court and judge's proficiency can lessen the workload-productivity correlation.

However, it is important to mention other studies showing the opposite conclusion. Murell's (2001) research indicated that a surge in caseload hinders judicial performance as mounting backlog results in congestion effect. Correspondingly, Castro et al., (2014) and Achenchabe and Akaaboune (2021) pointed out that excessive backlog is associated with low-level case dispositions and longer delays for Italian courts as well as courts in Morocco. The same findings were identified by other authors (Lewin et al., 1982; Ferro et al., 2018) specifying the adverse consequences of the high workload.

Ironically, in another case study of the Brazilian judiciary, the productiveness of judges started to decline after a few years of growth (Gomes et al., 2017). According to studies from occupational psychology, when professionals are overloaded with work, the negative reaction is likely to escalate (Jex, 1998; Paschoal et al., 2010). Most of the Brazilian judges have worked under a higher number of files they have to overcome regularly, and the fall in judges' performance was a signal that the ceiling of the production capacity can be produced by judges has been exceeded.

In this regard, there are several empirical investigations in the private sector apart from judicial studies. Among them, not only do many studies support the negative association between workload and productivity (Bhagat et al., 1985; Westman & Eden, 1996; Siu, 2003) but also some of them find the inverted-U relationship (Bruggen, 2015). The latter implies that the production of employees diminishes and subsequently rises to a certain extent.

Thus, the association between caseload and court output is more complicated than it would appear, and it could involve a judge's traits, workload, and even case complexity.

Overall, there is uncertainty on whether court performance can be improved through the growing number of judges in the empirical literature. When it comes to caseload, a rise in need for judicial services may have a positive impact on judicial productivity by motivating judges to make more endeavors and avoid case congestion, on the one hand. On the other hand, an increase in newly filed cases and pending cases may worsen a justice's capability to deal with caseload due to congestion effects (Buscaglia & Ulen, 1997). In other words, if the congestion effect is stronger than the incentive effect, we will face a backlog explosion. On the contrary, if the incentive effect prevails over the congestion effect, case dispositions are expected to boost.

2.5. The Relationship between Court Output and the Quality of Court Decision

Obviously, qualitative evaluation of a court's adjudication is quite a complex and very sensitive issue. Hence, there are not many studies trying to measure the quality of court production. Among existing research, common measures utilized to evaluate the quality of court decisions are reversal ratio (Dimitrova-Grajzl et al., 2015), appealed cases (Kim & Min, 2017), the number of citations, and length of judgment (Posner, 2000, p. 711). Another group of studies highlights the significance of procedural fairness such as the principle of trust, respect, neutrality, and voice.

There are several studies (Norris, 2018; Rachlinski et al., 2008) that have shown judgments decided within a short time are more inconsistent, and the time pressure increases judge's bias by stressing non-legal features, like race or gender. Kim and Min (2017) measured the appeal rate in First instance civil courts in Korea compared to their caseload and suggested that a low level of caseload enables judges to spend longer time and more effort on each lawsuit.

However, Rosales-Lopez (2008) and Dimitrova-Grajzl et al., (2015) have not

discovered a considerable relation between judicial speed and quality. They argue that the fact that a particular court is quicker or more efficient than others does not mean that this is the consequence of poor quality.

2.6. Micro Judicial-Behavior Level

As mentioned above, there are different theories explaining a judge's motivation and the conflicting findings on the effect of court size on justice performance. According to Beenstock and Haitovsky (2004), judges are individuals trying to raise their benefit of leisure time and minimize negative utility from large backlogs because judges believe it undermines their reputation and promotion.

From other perspectives, judges are not primarily incentivized by only their private benefit but are rather inspired to do great work (Engel & Zhurakhovska, 2017). Engel and Weinshall (2020) have found that judges receiving fewer cases allocate more resources in deciding and working on each case. It means that if court size expands, judges spend their newly available time for their remaining caseload. Judges working under a relatively lower pressure would tend to resolve cases on the merits, could type more detailed and well-explained standpoint and grounds in their judgments, and spend more time on their professional development. Further, Jonski and Mankowski (2014) suggest that there is a trade-off between the increase in resolved cases and their quality. It implies that it may not be an interest in the only spare time that elucidates why some research shows that an increase in court officials does not cause an increase in judicial output. Of course, the preference for free time or the quality of court decisions varies between judges. To sum up, we cannot draw an ultimate conclusion about what is the main factor of judicial efficiency, whether additional judge appointments boost judicial output, or whether judges are likely to be more productive as the level of incoming cases increases based on available research.

Previous studies' shortcomings are, first, most studies on judicial efficiency have been conducted on the data from the common law justice. There is a lack of empirical evidence from understudied post-socialist countries in civil law systems. Secondly, the majority of existing studies observed only one type of court data, such as commercial courts or civil courts. Finally, there has been little focus on the quality of judicial decisions. Particularly, we do not have enough literature studying the judicial system in terms of both the quantity and quality of case resolution.

To overcome these drawbacks, Mongolia has chosen to be one of the understudied post-socialist countries in civil law systems. There is a lack of indepth studies that identified determinants that could have the greatest impact on court efficiency in Mongolia. Importantly, this research can contribute to analyzing data from different types of specialized courts (administrative courts, civil courts, and criminal courts), from different levels (first instance courts, appellate courts, and the supreme court), and in different areas (rural and urban areas).

2.7. Hypotheses Formulation

In this research, we try to investigate the impact of key two determinants on justice output. The first is court size which is measured by the proportion of judges
serving at a particular court. The following is the caseload size and caseload per judge. Also, the impact of court output volume and caseload per judge on the quality of judicial decisions is studied. Based on previous studies and theoretical framework, the following hypotheses are developed to be tested:

Hypothesis 1 (H1): Caseload size is positively associated with court output. Hypothesis 2 (H2): Caseload per judge is positively associated with court productivity.

How do judges react to low or high levels of caseload? From the psychological perspective, a caseload may lead to a reduction in judges' productivity because the excessive workload could be a distraction and inconvenience. Psychology researchers, including Long et al., (1992), suggest that humans have emotional and defensive coping mechanisms for work overload rather than attitude to deal with problems which results in a decline in assignments. Moreover, Friedman and Mann (1993) argue that the stressful workplace shrinks employees' mental scope, and their performance does not improve. In addition, a decrease in the capability to handle complex tasks was observed as well (Larsen, 2001).

On the other hand, if the caseloads of judges who lack the challenge to be stimulated (Merelman, 1997) go up, their output will increase significantly, thereby increasing total output. Besides, under rational choice theory, when judges face caseload pressure, they adapt their productivity upward since judges do not want to endanger their prestige by increasing their backlogs and unreasonable delay. This is the same as the hypothesis put forward by Beenstock and Haitovsky (2004). As stated before, the extent of congestion effect and incentive effect varies from court to court in each country. The more cases filed, the more cases judges resolve, which is the domination of the incentive effect. Conversely, if the size of the caseload and backlog is too large to be resolved by judges, it no longer has a positive impact on the level of cases to be resolved due to the congestion effect.

In the case of Mongolia, even though not only there is a tendency to increase the caseload for all different types of courts but also the duration of case resolution is often criticized, the average number of serving judges is not low. Hence, the above hypotheses are formulated alleging that there is no congestion effect.

Hypothesis 3 (H3): The number of serving judges is not associated with court output.

Hypothesis 4 (H4): The number of serving judges is not associated with court productivity.

What effects do we anticipate for the increase in human resource productivity? All other things being equal, the more employees we have, the more goods or services they produce in most sectors. In other words, in most cases, there is a positive correlation between increases in human resources and total output as well as productivity, and an increase in human resources is used as the main measure to improve productivity. In this sense, we would expect that an increase in serving judges can improve court output and productivity.

However, in the case of the justice sector, the managerial approach and rational choice theory argue that judges always try to raise their benefit and prefer leisure to work. More specifically, appointments of additional judges decrease the caseload per judge, and judges feel relaxed and resolve fewer cases than before to reduce the hours they work and invest added time in leisure. Thus, court productivity and output at the aggregated level do not grow after an increase in the volume of incumbent judges. Also, these positions are asserted by much empirical literature from various countries. Based on rational choice theory and managerial approach view, Hypothesis 3 and Hypothesis 4 are developed.

Hypothesis 5 (H5): Court output is not associated with the quality of the judicial decision.

Hypothesis 6 (H6): Caseload per judge is not associated with the quality of the judicial decision.

One of the major concerns related to the increase in case dispositions is the quality of adjudications. According to the judicial approach, judges make an effort to improve their quality of decisions consistently, and they increase the time and attention they spend on each case if they have more time. Furthermore, there is a generalized idea that excessive interest in quantity might cause poor quality of work performance. In other words, making more attempts to increase quantitative tasks decreases the attempt available for quality of productivity (Holmström & Milgrom, 1991). These perceptions mean that if judges resolve a low volume of cases, the quality of their decisions is better.

However, as mentioned in previous sections, when rational choice theory explains a judge's behavior, they suggest that "Judges try to raise their benefit of leisure time and avoid case congestion". According to this theory, since the caseload size is increasing constantly in Mongolia, judges resolve more cases year by year to get rid of the huge backlog. Also, judges do not improve the quality of their decision by preferring leisure, even if they resolve a few cases after appointments of additional judges. Therefore, hypotheses (5 and 6) that volume of court output and caseload per judge does not affect the quality of judicial decision is formulated.

Chapter 3. Research Method

This chapter shows the study framework, descriptions of how measurement is done for each variable, data gathering method, and data analysis.

3.1. Research Framework

To address the research question and to test the hypotheses developed, an effective research method has to be applied. The quantitative approach which highlights objective measurements and the statistical or numerical analysis of data gathered is selected for conducting this research. The following figure describes the analytical research framework that shapes this study:

Figure 3. Research Framework. Source: Author

Phase 1:





3.2. Variables

The Systems theory identifies an organization as a mechanism of input, throughput, and output, which result in products and services, and courts can be considered as public service production units, composed of these repeated cycles - input, throughput, and output (Voigt & El-Bialy, 2016; Ippoliti &Tria, 2020).





As stated in previous literature, the input of a judiciary is classified into two categories: (1) resources which are categorized into three groups: physical capital resources, human resources, and organizational resources, and (2) incoming cases. The resource-based view explains that resources are a major factor in choosing a development strategy to enhance an organization's efficiency and performance because the strategy should be adapted to internal resources and capabilities except for their external situation (Grant, 1991). In the study, human resources and incoming cases (uncontrollable input) are used as inputs.

The throughput of justice is the procedure by which the received cases are handled by judges and judicial staff until a court decision (the output) is made (Albers, 2011). The measurements of the court throughput might be the duration of court procedure and the case backlogs.

With regards to output, the number of resolved cases is the most prevalent one utilized in the published writings (Castro et al., 2015; Peyrache & Zago, 2016) since the judicial main operation is to resolve cases and deliver judgments. In this study, there are two kinds of output: the number of resolved cases and the clearance rate. On the one hand, the quantity of resolved cases could be an indicator of court performance. On the other hand, the ratio of what percentage of all cases courts can deal with is another important measurement of court performance.

In summary, the number of resolved cases and clearance rate are dependent variables, and court size and demand for judicial service are independent variables in this study's first analysis because it is assumed that court size and demand for judicial service are the principal factors contributing to court output. For the second analysis, court output and caseload per judge are independent variables, and the quality of court decisions is a dependent variable.

3.3. Measurements for Independent Variables

Two different analyses are conducted in this research: (1) factors affecting court output and clearance rate and (2) the effect of court output on the quality of court decisions. The former involves court size and demand for judicial service as independent variables to find out how these factors affect outcome variables which are court output and clearance rate. In the second phase of the study, court output is an independent variable to investigate whether myriad case dispositions cause poor quality judicial decisions.

3.3.1. Measurement for Demand for Court Service

Demand for court service is proxied by the *caseload*. The level of caseload per judge can be increased or decreased through the receiving cases (quantitative tasks) and case complexity. However, a quantitative caseload is considered in this research, and it is the sum of a court's aggregate number of unresolved cases from the past year and the total number of received cases in the present year (Deyneli, 2012). For example, all cases received in 2015 (2015.01.01-2015.12.31) are added to the number of pending cases received in 2014, but not resolved by the 1st of January, 2015 to observe the caseload of 2015 in a certain court.

3.3.2. Measurement for Court Size

Court size is proxied by the *number of judges* working in a court. The total number of judges serving at certain courts in a particular year is calculated based on the number of months each judge served in that year. For instance, if a court had 4 judges between January and June and 3 judges between July and December in 2015, the number of judges serving in the court is 3.5.

3.4. Measurements for Dependent Variables

This research aims to identify the effects of some factors on court performance which is a difficult notion to measure. This is why it involves two different dependent variables in the first analysis: Court output and Clearance rate. These measurements are objective, but they have flaws: they do not consider the quality of decisions so for the second analysis, the quality of court decisions is a dependent variable.

3.4.1. Measurement for Quality of Court Decision

Qualitative measurement of the court decision is very complicated and debatable. Nowadays, Shavell's (1995) argument that appealing is a means of error correction is dominating, and the proportion of cases rescinded by the higher level of courts tends to represent the quality of court decisions for the first instance and appellate courts. Also, judges would rather avoid having their judgments appealed. The *reversal ratio*, therefore, is applied as a measurement of the quality of court judgments in this research. It is the percentage of cases totally or partially changed or reversed by higher courts, including Appellate courts and the Supreme court during a particular year.

However, it is important to mention that there are arguments that reversals result from differences in political congruence and opinion on technical legal issues between the low-level court and the higher-level court.

The number of cases appealed is not taken into account in this research because the decision on whether to appeal is entirely at the discretion of the defendants and plaintiffs, and parties to the case consider costs involved in the process and probabilities of change in the decision to appeal which does not matter the quality of court decisions.

3.4.2. Measurement for Court Productivity

Court productivity is proxied by the Clearance rate which is a measure of the

judicial system's ability to respond quickly to the current caseload. It is calculated as the number of resolved cases divided by the caseload and normalized by 100. A drawback of this measurement is that it does not take into account caseload size. Regardless of caseload size, it only measures what percentage of the total filed cases are handled. As a result, it is believed that a different indicator should be considered, which is court output.

3.4.3. Measurement for Court Output

Court output is measured by the *number of cases resolved* by a particular court during a given year. For example, the number of resolved cases of 2015 in a particular court is cases decided between the 1st of January, 2015, and the 31st of December, 2015. In Mongolia, all courts issue annual reports at the end of the year, and they report annually on how many cases they have received, how many cases they have resolved, and how many cases have been reversed and changed. In calculating the total number of cases resolved, it does not matter whether the case was completed across the whole legal process or in a simplified manner (e.g. withdrawal of the suit, dismissal without prejudice, confirming an agreement between the parties, etc). In other words, the number of cases resolved includes all of the disputes decided either by trial, settlement, and withdrawal.

In general, most cases that continue to trial are more labor-intensive and resource-intensive. If cases are resolved to transfer to another court, to dismiss without prejudice, to confirm an agreement between the parties and permit withdrawal of a claim and respondent's agreement, it will take less time and energy. Besides, the level of case complexity influences the level of the judge's workload differently. Judges and court clerks spend more time on the preparation and finalization of judicial decisions for complicated cases than a low level of complexity of a case. However, case complexity and the type of case resolution processes (e.g., either case resolved through the full legal process or withdrawal) are not taken into account in this quantitative analysis in terms of court output. Indeed, it is not at the judges' discretion what kind of procedure will be used to resolve the case (e.g. withdrawal, dismissal, and confirmation) in Mongolia, and it depends on procedural law and the interest of the parties.

More specifically, the following types of court decisions are made by courts in Mongolia, and the number of resolved cases, which measures court output, involves final judgments of lawsuits and final orders.

The decision types of the first instance court: order and judgment.

A judgment is the written final outcome of the lawsuit, which can be appealed. It includes a statement of the facts, law application to the facts, and the orders made. *An order* is a formal expression of any decision which is founded on objective considerations in the proceedings or after hearing other than final judgments. There are 2 kinds of orders: final and interim. *A final order* is an order that addresses all claims. Types of the final order: dismissal without prejudice /appealable/, confirming an agreement between the parties, withdrawal of a claim, and respondent's agreement /non-appealable/. *An interim order* is issued for purposes that are necessary for the case's progression. Some of them are appealable and some are non-appealable.

The decision types of the appellate court: judgment and order

A judgment is a written final determination that examines decisions of lower courts, which can be appealed. Types of judgments: Modify, reverse, or affirm the lower court's judgment.

An order is a formal expression of any decision in the proceedings or after hearing other than final judgments. Orders of appellate courts cannot be appealed. There are 2 kinds of orders: Final and interim orders. *A final order* is an order that addresses all claims. Types of the final order: confirming an agreement between the parties, withdrawal of a claim, and respondent's agreement. *An interim order* is another decision made during court proceedings.

The decision types of the Supreme court: judgment and order

A judgment is a written final determination that examines the decisions of appellate courts. Types of judgments: Modify, reverse, or affirm the appellate court's judgment.

An order is a formal expression of any decision in the proceedings or after hearing other than final judgments. Orders of the Supreme court cannot be appealed. There are 2 kinds of orders: Final and interim orders. *A final order* is an order that addresses all claims. *An interim order* is another decision made during court proceedings.

In summary, Table 3 demonstrates the operationalization and measurement for each variable. For each court, the following variables are observed:

 Table 3. The operationalization and measurement for each variable.

Dependent Variables	Measurement
I (a). Court output	The number of resolved cases during a given year by a particular court.
I (b). Court productivity	The number of resolved cases is divided by the caseload and normalized by 100.
II. Quality of court decision	The percentage of cases totally or partially changed or reversed by higher courts during a year. /reversal ratio/
Independent Variables	Measurement
I (a). Demand for court service /caseload/	Sum of a court's aggregate number of pending cases from the past year and number of received cases in the present year.
I (a, b). Court size	The total number of judges serving at a certain court in a particular year. It is calculated based on the number of months each judge served in that year.
II. Court output	The total number of cases resolved during a given year by a particular court.
I (b); II. Caseload per judge	The total number of caseloads is divided by the number of serving judges.

3.5. Data Gathering

Based on the nature of the research question, a longitudinal study is designed by involving observations of the same phenomenon at different points in time. It is applied to study changes over time. The data used in the research is administrative data coming from the annual judicial reports of Mongolian courts and other official statistical records. Those are gathered and published by the Judicial General Council of Mongolia. They have the most comprehensive and systematic court dataset currently in Mongolia. Consolidated reports /2015-2020/ are available on the website of JGC, and those show the number of serving judges in Mongolia. Other records, including caseload, resolved cases, and reversal ratio were obtained by making requests.

The unit of analysis is a court, and my dataset covers a total of 104 courts, including 80 first instance courts, 23 appellate courts, and the Supreme court over 6 years (2015-2020). The number of observations is slightly different from the number of courts due to different chambers in a court, incomplete data, missing data, and consolidated data.

There are 2 phases of data analysis and 3-panel datasets, two for the first phase of analysis and one for the second phase of analysis. Each of the first two datasets for the first phase of analysis has 107 observations for each year, including 84 local courts, 20 district courts, and the Supreme court with three Chambers, between 2015 and 2020. The dataset for the second phase examining the quality of decisions has 87 observations for each year, including 84 local courts and 3 district courts, between 2016 and 2020.

The first phase of the study observes data on (a) resolved cases during a year, (b) the volume of serving judges during a year (c) caseload during a year (d) the clearance rate of a year, and (e) caseload per judge for each court in the period of 2015-2020. The second phase of the study observes data on (a) reversal ratio during a year, (b) cases resolved during a year (c) caseload per judge for each court in the period of 2016-2020.

Table 4 shows court observations for each phase and each year.

Table 4. Observations for phase 1 and phase 2.

Phase 1. 2015-2020 (for each two analysis)

Observations for each year:

Local courts:	
First instance Criminal courts	21 observations
First instance Civil courts	21 observations
First instance Administrative courts	21 observations
Appeals of Criminal and Civil courts	21 observations
District courts:	
First instance Criminal courts	8 observations
First instance Civil courts	8 observations
First instance Administrative court	1 observation
Appeals of Criminal court	1 observation
Appeals of Civil court	1 observation
Appeals of Administrative court	1 observation
Supreme court, Chamber for Criminal case	1 observation
Supreme court, Chamber for Civil case	1 observation
Supreme court, Chamber for Administrative case	1 observation

Phase 2. 2016-2020

Observations for each year:	
Local courts:	
First instance Criminal courts	21 observations
First instance Civil courts	21 observations
First instance Administrative courts	21 observations
Appeals of Criminal and Civil courts	21 observations
District courts:	
First instance Criminal court	1 observation (including 8 districts)
First instance Civil court	1 observation (including 8 districts)
First instance Administrative court	1 observation
Appeals of Administrative court	1 observation
Appeals of Criminal court	1 observation
Appeals of Civil court	1 observation

Source: Author

3.6. Data Analysis

In compliance with many studies, panel data models are employed to analyze the data with repeated measures on both independent and dependent variables to examine the relationship between them. There are many advantages of panel data regression. Panel data is more informative and has more variability, and the problem of collinearity between the variables is less. It is also a better method to examine the dynamics of change over time (Baltagi, 2008). With panel data, random effect models and fixed effect models are the most commonly used.

In each analysis, one of the Random and Fixed effect models was selected based on the Hausman test evaluation. Every organization has its own special feature that may affect outcome variables. In the case of courts, they not only deal with different types of cases but also their level is different. Besides, legal or policy changes, like economy-wide events and reforms of the judicial system that happen over time, may also affect court output. These biases stemming from these two types of unobservable factors could be addressed by a fixed and a random effect model with the court and time-invariant variables. In these models, it is assumed that the cross-section units are unique and heterogeneous.

In the Random effect model, 9 court dummy variables and a year dummy variable for all courts are created to compare differences between them. For the first and second phase analysis, 9 court dummies include court specialization, such as civil court (1), the criminal court (2), the administrative court (3), and civil as well as criminal court (4), court levels, such as the first instance court (5), the appellate court (6), and the Supreme court (7), and court location, such as local (8)

and district courts (9). A year-2016 dummy variable is used for only the first phase analysis.

There is a perspective that perhaps judges in a nation where the judiciary enjoys high salaries are less motivated to work harder to increase their wages. Although significant reforms or changes that may influence court output did not occur in Mongolia between 2015 and 2020, the salary level of judges doubled after the Judicial General Council Board changed in 2016. Therefore, the year-2016 is included as a time dummy variable for the first stage analysis.

Collected data was recorded first in an Excel file. To optimize data processing, this research uses the SAS 9.5 version for inputting, calculating, and producing certain outputs. The tool is meant to reduce errors in coding and computation, providing highly accurate data for analysis.

Chapter 4. Data Analysis and Results

In chapter 3, the methodology of this study has been provided. This chapter evaluates and presents descriptive statistics, hypothesis testing, and discussion. The Random and Fixed effect regressions have been run to measure the relationships between independent and dependent variables. This study was concluded by discussing the findings.

4.1. Descriptive Statistics

The study aimed to identify the impact of court size and caseload size on court performance and to examine whether the quantity of court output affects the quality of output. This section illustrates the descriptive statistics for each of the outcome and explanatory variables and their comparison based on court specialization and court level, before presenting regression results. Tables 5A and 5B, respectively, show descriptive statistics for the variables, while Tables 6A and 6B present changes in variables in the years 2015-2020. The descriptive statistics illustrate the local and district courts separately because they differ in many respects, including demography, location, economy, development, and case complexity.

Table 5A. Summary	y Statistics 1	for Local	Courts.
-------------------	----------------	-----------	---------

Courts	Variables	N Obs	Mean	Std Dev	Min	Max
First Instance Criminal						
Courts	Resolved cases	126	205	107	47	540
	Clearance rate	126	94	3	85	99
	Judges	126	3.1	0.6	2	5
	Caseload	126	218	115	51	570
	Reversal ratio	105	13	7	2.6	38.5

First Instance Civil	Caseload per Judge	105	69	31	17	167
Courts	Resolved cases	126	861	411	161	2260
	Clearance rate	126	78	5.4	61	89
	Judges	126	3.3	0.9	1.9	6
	Caseload	126	1092	513	264	2720
	Reversal ratio	105	2.8	2	0.5	10
	Caseload per Judge	105	264	87	70	439
First Instance						
Administrative Courts	Resolved cases	126	32	16	4	96
	Clearance rate	126	73	14	16.6	97
	Judges	126	2.7	0.5	1	4
	Caseload	126	44	21	12	138
	Reversal ratio	105	20	12	0	100
	Caseload per Judge	105	13	6.1	2.5	34
Appellate Courts of Criminal and Civil						
Cases	Resolved cases	126	98	67	13	343
	Clearance rate	126	92	5	68	100
	Judges	126	3.2	1.1	2	7
	Caseload	126	105	72	15	375
	Reversal ratio	105	30	14	8	78
	Caseload per Judge	105	30	14	4	75

Source: Author's calculation using data from the Judicial General Council

Table 5B. Summary Statistics for District Courts.

Courts	Variable	N Obs	Mean	Std Dev	Min	Max
First Instance						
Criminal Courts	Resolved cases	48	641	481	66	2064
	Clearance rate	48	92	3.8	79	99
	Judges	48	6.83	2	2.7	11.2
	Caseload	48	690	511	69	2160
	Reversal ratio	5	13	3.4	9.5	16.9
	Caseload per Judge	5	111	42	60	155
First Instance Civil						
Courts	Resolved cases	48	3202	1685	350	5720
	Clearance rate	48	70	6.4	59	86
	Judges	48	10	3.9	2.8	16.8
	Caseload	48	4755	2637	498	9547
	Reversal ratio	5	4.8	0.5	4.2	5.7
	Caseload per Judge	5	319	15	306	338
First Instance Administrative						
Courts	Resolved cases	6	1000	81	895	1079

	Clearance rate	6	58	6.6	48	66
	Judges	6	17	2.5	12	21
	Caseload	6	1729	224	1497	2062
	Reversal ratio	5	24	3.5	19.2	28
	Caseload per Judge	5	57	5	50	60
Appellate Court of						
Criminal Cases	Resolved cases	6	1111	268	833	1525
	Clearance rate	6	95	1	94	97
	Judges	6	14.5	0.8	14	16
	Caseload	6	1164	282	870	1609
	Reversal ratio	5	12	2	10	16
	Caseload per Judge	5	77	16	57	95
Appellate Court of	Pasalvad cases	6	2261	377	1722	2605
Civil Cases	Indres	6	14	14	1722	2005
	Clastence rate	6	14 80	1.4	13	02
	Clearance rate	0	2520	1.0 271	07	92 2047
	Caselloau Deversel ratio	5	10	571	1911	2947
	Coopland non Indee	5	152	5.8 25	10	174
Appellate Court of	Caseload per Judge	5	155	25	115	1/4
Administrative Cases	Resolved cases	6	1409	202	1049	1668
	Clearance rate	6	95	2	93	98
	Judges	6	12	0.91	10	13
	Caseload	6	1479	202	1126	1750
	Reversal ratio	5	11	1.3	8.8	12
	Caseload per Judge	5	133	17	115	157
Supreme Court, Chamber of Criminal						
cases	Resolved cases	6	711	306	400	1147
	Clearance rate	6	96	2.6	92	98
	Judges	6	6	0.6	5.2	7
	Caseload	6	740	325	406	1217
	Caseload per Judge	6	128	63	62	203
Supreme Court,						
Chamber of Civil	Pasalvad cases	6	1308	540	421	2074
Cases	Clasteranae rate	6	1390	540 2	421	2074
	Ludges	0	90 75	ے 1	91	90
	Casaland	0	1462	1 574	450	0
	Caselland non-index	0	219	20	432	2105
Supreme Court	Caseload per judge	0	218	39	1/1	270
Chamber of						
Administrative cases	Resolved cases	6	607	113	421	746
	Clearance rate	6	94	2.8	90	97
	Judges	6	7.4	0.5	6.6	8
	Caseload	6	641	115	452	762
	Caseload per judge	6	87	13	60	95

Tables 5A and 5B show the mean number of case dispositions, clearance rate, number of judges, caseload, caseload per judge as well as reversal ratio in the period of 2015-2020. The first table is 84 local courts located in 21 provinces of Mongolia, while the second table is 23 district courts located in the capital city divided into 8 districts.

4.1.1. Descriptive Statistics for Dependent Variables

The proportion of cases decided by district courts of the first instance compared to local courts of the first instance, they hear three times as many criminal cases, four times as many civil cases, and even 30 times as many administrative cases as local courts. District appellate courts also resolve much more cases than local appellate courts. In other words, local court size, caseload, and court output are relatively smaller than district courts because of the population size as well as economic and strategic importance.

In the years 2015–2020 the largest group of cases adjudicated by district and local courts of the first instance were civil cases. For example, local courts of the first instance for civil cases handled an average of four times as many cases as first instance courts for criminal cases, with a standard deviation of 107, and district courts of the first instance for civil cases resolved five times as many cases as criminal courts, with standard deviation 1685, meaning that district civil courts also differ greatly in the level of cases they resolve.

While the proportion of administrative cases resolved by local courts of the first instance over time was the lowest compared to other types of first instance courts, the mean number of administrative cases resolved by district courts of the first instance is higher than criminal cases. This difference in the type of case resolved is the same for appellate courts. When it comes to the Supreme court, administrative and criminal Chambers dealt with a similar number of cases, 607 and 711, respectively, while the civil Chamber resolved twice as many cases with 1398.

This, however, is only a quantitative comparison, and courts for criminal, civil, and administrative cases differ in the complexity of the cases. For example, administrative cases include tax, land, intellectual property, and civil servants' disputes, and judges serving in administrative courts deal with these different types of cases. In addition, some cases received by district courts could be more complicated than in local courts. Data collected does not allow us to examine the difference in time judges spend on resolving different kinds of cases.

The clearance rate indicates the court's ability to deal with the inflow caseload. Both local and district courts of the first instance for administrative cases demonstrate the lowest clearance rate, whereas the clearance rate of courts for criminal cases is higher than courts for civil and administrative cases. Also, the largest standard deviation for clearance rate is administrative courts. For appellate courts, their productivity in both rural and urban areas is not only greater than first instance courts but also the standard deviation is small. Finally, all three chambers of the Supreme court are highly productive. Furthermore, the mean number of administrative cases reversed and changed by appellate courts is considerably larger than criminal and civil cases in both local and district courts. Interestingly, the reversal ratio of courts of the first instance for civil cases which have high caseload and dispositions is not high. Meanwhile, the number of civil cases reversed and changed by the Supreme court is greater than criminal and administrative cases. In other words, the quality of appellate courts for civil cases is lower than that of trial courts. The average reversal ratio of local appellate courts is worse than district appellate courts. Standard deviation is ranged from 0.5 to 5.8 in district courts and from 2 to 14 in local courts, which means that the variation of reversal ratio is not high compared to caseload size and the number of resolved cases.

4.1.2. Descriptive Statistics for Independent Variables

In terms of the total caseload of the district and local courts of the first instance, the caseload size of civil cases is the largest. This is followed by the caseload of criminal cases, which is five times less. While the caseload for local administrative courts is also five times less than criminal courts, the mean number of cases received by district administrative courts in the first instance is 2.5 times as many cases as criminal courts. It means that demand for criminal justice is high in rural areas, and administrative disputes are dominating in urban areas after the civil courts. As for the district appellate court, the civil court is also the busiest, followed by the administrative court.

Despite the caseload size, the average proportion of serving judges for local courts of the first instance in the analyzed period appears very close to each other,

about 3 judges. Therefore, the mean quantity of caseload per judge serving in courts for civil cases is relatively higher than courts for criminal and administrative cases. However, district courts of the first instance for administrative cases have more judges than ordinary courts, thereby average caseload per judge of administrative courts is low. Local appellate courts for civil and criminal cases have an average of three judges, and the mean caseload per judge is only 30 cases because their demand is flat. Meanwhile, the average number of judges in district appellate courts for civil and administrative cases have a set of civil and criminal cases because their demand is flat. Meanwhile, the average number of judges in district appellate courts for civil and administrative cases does not differ much, but the caseload per judge in criminal courts is twice as low. It implies that the proportion of judges is not determined by the size of incoming cases or by their output.

According to the law, the Chambers of the Supreme court, including criminal, civil and administrative, each have eight judges. Nevertheless, between 2015 and 2020, each chamber had an average of six judges. Judges dealing with civil cases have the highest caseload, while judges in the administrative chamber have the lowest amount of caseload.

Court Level	Court Type	2015	2016	2017	2018	2019	2020
Mean Resolved Cases							
Appellate Court	criminal and civil	88	95	103	102	95	104
First Instance Court	criminal	155	132	207	241	247	249
	civil	686	845	828	933	797	1076
	administrative	24	33	40	32	32	29
Mean Clearance rate							
Appellate Court	criminal and civil	94	90	91	95	93	91
First Instance Court	criminal	93	93	94	96	94	92
	civil	75	77	78	83	77	79

 Table 6A. Changes over time in Variables for Local Courts.

_

	administrative	58	59	84	76	81	78
Mean number of Judges							
Appellate Court	criminal and civil	3	3	3.4	3.2	3.2	3.1
First Instance Court	criminal	3	3	3	3.1	2.8	2.9
	civil	4	3	3	3.3	3.2	3.3
	administrative	3	3	3	2.7	2.6	2.5
Mean size of Caseload							
Appellate Court	criminal and civil	96	104	113	108	101	112
First Instance Court	criminal	168	142	220	252	262	269
	civil	919	1092	1052	1119	1025	1344
	administrative	41	56	48	42	40	37
Mean Reversal Ratio							
Appellate Court	criminal and civil		35	26	39	30	22
First Instance Court	criminal		17	14	11	10	12
	civil		3	3	2.7	3	2.3
	administrative		20	23	20	20	17
Mean Caseload per Judge							
Appellate Court	criminal and civil	26	32	33	32	30	35
First Instance Court	criminal	51	43	65	79	91	91
	civil	248	302	302	336	316	404
	administrative	15	19	18	15	16	15

Source: Author's calculation using data from the Judicial General Council

 Table 6B. Changes over time in Variables for District Courts.

Court Level	Court Type	2015	2016	2017	2018	2019	2020
Mean Resolved Cases							
Supreme Court	criminal	512	400	432	851	927	1147
	civil	1376	1655	1829	2074	1332	1104
	administrative	421	548	746	689	608	634
Appellate Court	criminal	915	833	928	1164	1302	1525
	civil	1722	2095	2605	2519	2195	2431
	administrative	1049	1460	1668	1382	1416	1476
First Instance Court	criminal	368	329	466	834	920	931
	civil	2980	3262	3201	2903	2409	2761

	administrative	926	1079	1060	964	2074	895
Mean Clearance Rate							
Supreme Court	criminal	98	98	93	99	95	94
	civil	96	97	92	96	97	99
	administrative	93	98	98	94	90	95
Appellate Court	criminal	95	96	94	97	96	95
	civil	90	88	88	93	90	87
	administrative	93	94	95	95	95	98
First Instance Court	criminal	94	89	91	93	94	91
	civil	72	71	69	70	68	69
	administrative	49	52	60	63	66	60
Mean number of Judg	es	12	52	00	05	00	00
Supreme Court	criminal	7	6.5	6	5.3	5.2	6
I	civil	8	8	8	8	8	5
	administrative	7.5	6.6	8	8	7.3	7
Appellate Court	criminal	14.1	14.2	14.2	14	15	16
	civil	12.5	15	15.5	16	13	14
	administrative	10	11.5	11.6	12	11.5	12.8
First Instance Court	criminal	6.7	6.9	6.9	6.7	6.5	7.2
	civil	8.4	10.4	10.8	9.5	8.6	8.2
	administrative	13.3	17.7	21	16	17.9	17
Mean size of Caseload	l						
Supreme Court	criminal	520	406	466	861	971	1217
	civil	1435	1711	1991	2163	1370	1120
	administrative	452	561	762	730	674	668
Appellate Court	criminal	961	870	984	1198	1363	1609
	civil	1911	2372	2947	2721	2440	2784
	administrative	520	1555	1750	1458	1488	1495
First Instance Court	criminal	390	343	520	901	970	1015
	civil	4266	4762	4787	4187	3596	4109
	administrative	1904	2062	1772	1521	1622	1497
Mean Reversal Ratio							
Appellate Court	criminal		10	12	12	16	13
	civil		23	22	23	12	11
	administrative		10	12	12	10	9
First Instance Court	criminal		17	15	10	10	12
	civil		5	6	5	5	4

	administrative		28	27	23	22	27
Mean Caseload per Judge							
Supreme Court	criminal	74	62	78	162	187	203
	civil	179	214	249	270	171	224
	administrative	60	85	95	91.25	92	95
Appellate Court	criminal	68	61	69	86	91	101
	civil	153	158	190	170	188	199
	administrative	113	135	150	121.5	129	117
First Instance Court	criminal	55	46	69	122	134	126
	civil	467	411	390	383	325	398
	administrative	143	116	84	95	91	88
Population (millions)		2.998	3.056	3.114	3.17	3.225	3.278

Source: Author's calculation using data from the Judicial General Council

4.1.3. Changes over time in Independent and Dependent variables

Tables 6A and 6B show changes over time in the average number of resolved cases, clearance rate, judges, caseload, reversal ratio, and caseload per judge. There is an overall trend that resolved cases increase and decrease depending on the incoming cases throughout the entire period 2015-2020.

The court output and caseload of local criminal and civil courts of the first instance are growing over time, and administrative case resolution takes an increase until 2017 and then decreases slightly between 2018 and 2020. Demand for criminal court service and case disposition in district criminal courts, including the first instance, appellate and Supreme court, increased significantly between the years 2015 and 2020 like local courts. However, courts for civil and administrative cases reveal a little different fashion from local courts. For example, as reported in Table 6B, there is a slowly declining trend in average civil court output and demand size since 2017. Moreover, the average caseload and output of administrative courts at the first instance and appellate level increased sharply between 2015 and 2017 and then remained constant in recent years.

Concerning local appellate courts, the appealing rate and volume of resolved cases grew in 2015-2017, and then, it stabilized.

As for court productivity, there has been no clear dynamic in the clearance rate of all types of courts at all levels, either in the district or at the local level. Their productivity is relatively stable every year. However, the efficiency of the first instance administrative courts is likely to increase. This may be related to the increase in the number of judges. Or in recent years, the administrative court activity may begin to become more smooth because it was established later than ordinary courts, in 2004.

During those years, the average number of judges serving at local courts, including first instance and appellate courts, did not change significantly, and it was approximately 3 judges each court. However, the number of judges for administrative cases is likely to decrease relatively. Table 6B illustrates district courts, and the number of judges in ordinary and special courts varies. While the number of criminal judges of first instance courts is stable with about 6 judges, administrative and civil judges of first instance courts reached their highest point in 2017, 10.8 and 21, respectively, declined a little in 2018, and then stabilized.

Regarding district appellate courts, even if the proportion of judges handling criminal cases was stable, it experienced a gradual increase in recent years. It may be due to the growing demand for criminal court service. Although the proportion of judges for civil and administrative cases increased in 2015-2018, the number of judges for civil cases declined slightly since 2019, while the level of judges for administrative cases is consistent. The average number of judges serving on the Supreme court features a slight decrease.

Furthermore, from Table 6 above, there is a declining trend in the average reversal ratio of the first instance and appellate courts in rural and urban areas over time, showing that the quality of decisions is improving even if the caseload per judge is growing.

Figure 5 illustrates the evolution of the average number of resolved cases, serving judges, and received cases between 2015 and 2020, while Figure 6 describes the average number of caseloads per judge and reversal ratio between 2016 and 2020 in Mongolia separated by local and district courts. Regardless of the change in the number of judges, two lines for received cases and resolved cases show the same direction to increase and decrease over time in local and district courts as well as all three levels of courts. As for the reversal ratio, we can see the opposite direction between the mean caseload per judge and the reversal ratio.

Figure 5. The average number of filed cases, resolved cases, and serving judges in Mongolia, 2015-2020. *Source: Author's calculation using data from the JGC*











Figure 6. The average number of caseloads per judge and reversal ratio in Mongolia, 2016-2020. *Source: Author's calculation using data from the JGC*









From the scatter plots of Figure 7, it can be seen that there is a positive correlation between caseload and resolved cases, a negative correlation between the number of judges and clearance rate, and no relationship between reversal ratio and resolved cases. However, further regression analyses are needed.





Source: Author's calculation using data from the JGC

4.2. The Hausman Test

Based on the descriptive statistics and scatter plots, there are some possible correlations between independent and dependent variables. To test these possibilities, regression analysis is carried out. There are several different methods, including the Breusch-Pagan Lagrange multiplier test and the Hausman test, to identify which model is more appropriate for the data. This study has three datasets, and before each regression is performed, a Hausman test is utilized to determine a more appropriate model. When this test runs, the null hypothesis is supposed that the preferable model is a random effect. When the null hypothesis is rejected (p<0.05), it means that the Fixed Effects model is more applicable compared to Random Effects (Hausman, 1978).

For the first stage analysis with a dependent variable of the volume of resolved cases (H1 and H3), the p-value of the Hausman tests is <0.05 rejecting the null hypothesis, which means that the Fixed effect model is efficient. The next two Hausman test results for the first stage analysis with a dependent variable of clearance rate (H2 and H4) and the second stage analysis (H5 and H6) fail to reject the null hypothesis with p-value 0.19 and 0.8, which means that the Random effect model is applicable for estimating these panel data.

Table 7. The results of the Hausman ter
--

Analysis	Hausman Test for Random Effects					
Analysis	Coefficients	DF	m Value	Pr > m		
First phase analysis with DV resolved cases	2	2	26.93	<.0001		
First phase analysis with DV clearance rate	2	2	3.24	0.1981		
Second phase analysis	3	3	1	0.8021		

4.3. Hypotheses test

As discussed in Chapter 2, six hypotheses are developed to understand the correlation between demand for court service, the number of judges, court output, clearance rate, and quality of judicial decisions. To test the hypotheses, three

regression models, including fixed and two random effect models, have been run.

Model 1 (fixed effect) includes a dependent variable (the volume of case dispositions) and the independent variables (caseload and number of judges). In Model 2 (random effect), the dependent variable is replaced with the clearance rate to check the effect of caseload per judge and the number of judges on court productivity as well. In Model 3 (random effect), a dependent variable is the quality of court decisions, and independent variables are the number of resolved cases and caseload per judge. In these models, court specialization, court level, location, and year-2016 are used as dummy variables.

Regression equation models are as follows:

Model 1 (fixed effect estimation):

Resolved cases_{it} = $\beta 0 + \beta 1$ Judge_{it} + $\beta 2$ Caseload_{it} + $\alpha_i + \upsilon_{it}$

Where:

i = courts

t = time period

 α_i = unobserved heterogeneity across individuals correlated with regressor

 $\upsilon_{it} = idiosyncratic \ error$

Model 2 (random effect estimation):

Clearance rate_{it} = $\beta 0 + \beta 1$ Judge_{it} + $\beta 2$ Caseload per judge_{it} + $\beta 3$ court type_i + $\beta 4$ level_i + $\beta 5$ geo_i + $\beta 6$ year + α_i + υ_{it}

Model 3 (random effect estimation):

 $Quality_{it} = \beta 0 + \beta 1 Resolved \ cases_{it} + \beta 2 Caseload \ per \ judge_{it} + \beta 3 court \ type_i$

 $+ \beta 4 geo_i + \alpha_i + \upsilon_{it}$

Where:

i = courts

t = time period

 α_i = other unobserved heterogeneity

 $v_{it} = idiosyncratic error$

Hypothesis 1: Caseload size is positively associated with court output.

Hypothesis 3: The number of serving judges is not associated with court output.

 Table 8. Regression results - Fixed effects (1)

Dependent variable - Resolved cases							
Independent Variables	Estimate	Standard Error	Pr > t				
Judges	2.368	4.929	0.631				
Caseload	0.722	0.016	<.0001***				
No.obs	524						
R-squared	0.99						
Pr>F	< 0.0033						

*** significant at <.0001

Table 8 presents the regression result using the Fixed effect Model (1). The model fit shows $R_2=0.99$, which means about 99% of the variance of the number of resolved cases could be explained by independent variables. Caseload size is significant, affecting the number of resolved cases. Every case filed newly will increase the volume of resolved cases by 0.7. However, the number of serving
judges is insignificant, which means that an increase in the number of judges could not increase case dispositions.

Hypothesis 2: Caseload per judge is positively associated with court productivity. Hypothesis 4: The number of serving judges is not associated with court productivity.

Dependent variable - Clearance rate			
	Estimate	Standard Error	Pr> t
Judges	-0.995	0.232	<.0001 ***
Caseload per judge	-0.006	0.005	0.22
civil courts	7.133	1.996	0.0004 ***
criminal courts	20.757	1.22	<.0001 ***
civil and criminal courts	-2.021	3.636	0.5785
first instance courts	-17.9	2.684	<.0001 ***
appellate courts	4.043	3.824	0.2908
year-2016	4.135	2.836	0.1453
local courts	-0.986	1.779	0.5793
No.obs	632		
R-squared	0.46		

 Table 9. Regression results - Random effect (2)

*** significant at <.0001

The result of the Random Effect Model (2) could be seen in Table 9. Caseload per judge does not significantly affect court clearance rate, whereas the number of

judges negatively affects court clearance rate. When the number of judges increases by one, the clearance rate decreases by 0.9. The model fit shows $R_2=0.46$, which means about 46% of the variance of the clearance rate could be explained by independent variables.

Compared to administrative courts, courts for civil and criminal cases have a positive effect on the clearance rate. Civil and criminal courts have more clearance rates than administrative courts by 7 and 20 percent respectively. The clearance rate of first instance courts is less than the Supreme court by 17 percent. Other different types of courts did not show statistically significant differences. Also, an increase in salary and court location does not affect the clearance rate.

Hypothesis 5: Court output is not associated with the quality of the judicial decision.

Hypothesis 6: Caseload per judge is not associated with the quality of the judicial decision.

Caseload per judge	Estimate -0.028	Standard Error 0.012	Pr> t 0.021**
Resolved cases	0.000	0.000	0.338
civil courts	-8.790	3.563	0.014**
criminal courts	-5.326	2.084	0.011**
local courts	0.995	3.615	0.783

 Table 10. Regression results - Random effect (3)

Dependent variable - Reversal ratio

R-squared

0.28

*** significant at <.0001

** significant at <0.05

Table 10 reveals the regression result using Random Effect Model (3). Interestingly, caseload per judge is significant, negatively affecting the quality of judgments measured by reversal ratio. The increase of a case in caseload per judge decreases the reversal ratio by 0.02 percent. In other words, an increase in caseload per judge does not lead to high number of reversed cases. With regards to the level of resolved cases, it does not affect the reversal ratio. The model fit shows R₂=0.28, which means about 28% of the variance of the quality of court decisions could be explained by independent variables.

The number of cases changed and reversed by higher-level of ordinary courts, including criminal and civil courts, is less than in administrative courts. Besides, whether the court is local or district does not affect the quality of court decisions. To conclude the hypothesis tests, the summary of all results could be seen below:

Table 11. Summa	ry of Hy	potheses	Test
-----------------	----------	----------	------

Supported	Not Supported	
Hypothesis 1: Caseload size is positively	Hypothesis 2: Caseload per	
associated with court output.	judge is positively associated	
Hypothesis 3: The number of serving judges is	with court productivity.	
not associated with court output.	Hypothesis 6: Caseload per	
Hypothesis 4: The number of serving judges is	judge is not associated with the	

not associated with court productivity.	quality of the judicial decision.
Hypothesis 5: Court output is not associated	
with the quality of the judicial decision.	

4.4. Discussion

The findings of this study helped us to identify the impact of the proportion of judges and caseload on court output and productivity as well as how the volume of court output influences the quality of court decisions in the case of Mongolia. It is worth reminding that judicial performance was measured in two different dimensions: court output and clearance rate while studying the impact of demand for court service and judicial stuffing.

Firstly, a frequent policy assumption regarding efficiency is that more inputs, especially human resources, can produce more products and services, thereby boosting their output and productivity. However, theoretical views and recent studies have doubted this presumption. In the case of the Mongolian Judiciary, it was found that the total number of resolved cases does not depend on the volume of incumbent judges. It means that an increase in the number of judges does not increase the case resolutions. Also, the study result indicates that the number of serving judges negatively affects the clearance rate (Table 9). More specifically, clearance rate decreases by 0.9 percent as an additional judge is appointed. Meanwhile, the clearance rate is not affected by caseload per judge. This finding is consistent with the results for Israel, Slovenia, and Italy (Beenstock & Haitovsky, 2004; Dimitrova-Grajzl et al., 2012; Castro, 2009).

Secondly, about an independent variable of caseload, some people argue that

an increase in caseload size automatically leads to an increase in the volume of resolved cases. Nevertheless, many empirical studies identified that the positive relationship between caseload and court output is not inevitable. For example, studies for Italian courts (Castro et al., 2014) and Morocco courts (Achenchabe & Akaaboune, 2021) show that a surge in caseload could hinder judicial performance as backlog explosion results in congestion effect. Furthermore, the productivity of the Brazilian judiciary grew with an increase in caseload, but then suddenly decreased (Gomes et al., 2017) since judges' production capacity exceeded.

Data used in this research revealed that the caseload size can significantly positively influence the volume of resolved cases. When judges have the capacity to handle more incoming cases, the more cases judges resolve, and this is an incentive effect. Therefore, it could be concluded that there is no congestion effect so far in Mongolian justice, and the incentive effect dominates since the number of resolved cases is likely to grow over time with the increasing caseload. Another possible explanation is that the volume of incumbent judges is sufficient to handle this increasing caseload.

These findings of the first two analyses could be explained by the rational choice theory developed by Posner (1983). The theory explains a judge's behavior and suggests that judges adapt their efforts based on caseload size and the number of sitting judges, maximizing their utility function. More particularly, an increase in the number of judges in a certain court, ceteris paribus, results in the reduction of caseload per judge compared to when no additional judges were appointed. Consequently, judges decrease their endeavor to resolve more cases, thereby declining the total number of case dispositions. On the other hand, the rational

choice theory argues that judges resolve more cases as caseload pressure increases because they do not want to damage their reputation mounting backlog. Our finding that court productivity is not affected by judicial staffing but is affected by caseload size is consistent with this theory assumption.

Thirdly, the analysis of the second phase on the quality of court decisions is in part consistent with rational choice theory and part with the judicial approach as well. According to rational choice theory, not only do judges make the quality of their decisions poor as they deal with caseload quickly avoiding backlog explosion but also they do not improve the quality of their decision even if new judges are appointed since they prefer leisure to make more effort. Conversely, the judicial approach argues that judges sacrifice leisure for case dispositions, and as the number of cases resolved by judges decreases, judges expend longer time on each case improving the quality of judgments.

It was found that the quality of the judicial decisions does not depend on the level of resolved cases, and there is no evidence of the fact that quality decreases when case disposition grows considerably. This result is likely to support an argument of the judicial approach that judges sacrifice leisure rather than the quality for an increase in the proportion of case dispositions.

Furthermore, the finding of the second phase analysis even indicates that caseload per judge has a negative effect on the reversal ratio. It means that even though case dispositions per judge decrease, the level of reversed and changed cases by higher courts could increase. It can be explained by the rational choice theory perspective that judges prefer leisure and do not polish the quality of their decision even if new judges are appointed. A further possible answer is that the experience, the ability to apply the law, and knowledge of judicial precedents of a judge with a high caseload may increase more than a judge with less caseload, thereby improving the quality of their decisions. However, available data do not enable us to investigate these factors.

For each of the three analyses, fixed and random regressions have been re-run, and the results were congruent regardless of the estimation technique used(Appendix).

The results of fixed and random effect estimation show that court location and year-2016 dummies are not significant. It implies that there is no significant difference between local and district courts, as well as having low wages and high wages in terms of court productivity and quality of their decisions. In addition, ordinary courts, including criminal and civil courts, have a higher level of clearance rate and better quality of decisions than administrative courts. And the clearance rate of first instance courts is lower than the appellate and the Supreme court. However, these findings should be viewed with caution because of case complexity differences.

Chapter 5. Conclusion and Policy Recommendation

This chapter shows the conclusion of this study. It summarizes the main findings and offers policy recommendations based on the results of the research. Several limitations of the research and future considerations were also added for further reference.

5.1. Conclusion

Well performing judiciaries not only protect human rights but also assist to build a favorable environment for economic development and accountability mechanisms. In other words, improvement in efficiency and effectiveness of the judicial sector is one of the top priorities since justice's significance for state development, stability, and citizen security is huge. The first important step towards an effective justice system is to create conditions for economic independence and independence from other powers. At the same time, courts need to work efficiently and account for how the budget is spent because they are financed with public money as a part of state infrastructure.

However, in most developing countries, budget allocation for the judicial sector keeps being not significant due to many controllable and uncontrollable factors, such as lack of public resources, inability to allocate resources efficiently, and economic crisis. Particularly, during the COVID19 era, as the economies of most countries are in turmoil and government agencies are in austerity mode, the judiciary needs to operate cost-effectively as well. Therefore, policymakers need an empirically based analysis of the court performance, its main determinants, and the

behavior of judges so that they develop policies that meet the number of resources and improve justice performance.

Thus, this thesis aims to answer questions about court performance: (1) How does the volume of serving judges affect the total court output and productivity? (2) How does increasing caseload affect the total court output and productivity? (3) How does the number of case dispositions affect the quality of their decisions?

Indeed, without any empirical study, some people say that it is obvious that court output depends on caseload, while some think that court output directly positively depends on the number of judicial staffing. In fact, based on existing empirical studies on judicial efficiency, not only court performance could vary depending on whether caseload size exceeds the capacity of the judges serving at a court which is a congestion effect but also the impact of judicial staffing could vary due to judges' behavior.

This research contributes to the current studies on court efficiency investigating the impact of the number of judges and incoming cases on court output and productivity as well as the relationship between court output and the quality of court decisions in the case of Mongolia.

It was found that (1) the proportion of serving judges does not affect court output. It even negatively affects the court clearance rate, implying that judge productivity is endogenous. (2) Contrary to judicial staffing, the model for caseload size indicates that demand for judicial service is a key determinant of case disposition. The results show that caseload pressure increases court output. At the same time, the incentive effect of caseload might have dominated the congestion effect in the period of 2015-2020 in Mongolia. (3) Moreover, whether a large number of cases are resolved or a few cases are resolved does not influence the quality of the court decision. In other words, being quantitatively efficient does not mean that it is the consequence of poor quality. Apart from that, our finding identifies that caseload per judge brings a negative effect on the reversal ratio.

These patterns of judicial behavior we explored are consistent with the rational choice theory presumptions that court productivity is driven by the caseload, and existing judges adjust their behavior by resolving fewer cases in the appearance of additional judges. However, these results have to be taken with caution because all variables that might influence court output and productivity, such as judge's experience, educational level, available technology, facilities, and procedural law, were not included due to a lack of data in the study.

5.2. Policy Recommendation

Optimizing human productivity is a tough task for the private and public sectors. Based on the empirical evidence found from this research, a couple of policy proposals on how to increase court productivity, how to improve the quality of court decisions, and how to allocate human resources are recommended.

In the short run, this study recommends that increasing the number of judges to improve court productivity is not an effective measure because judges' productivity is endogenous. Instead of that, policymakers have to focus on other incentives, tools, and training needed for incumbent judges to resolve the case quickly and effectively. For instance, policies would consist of advancing available technology and software, reduction in administrative work for judges, eliminating legislation contradiction, and investments in facilities, including hearing spaces.

Mongolian court output is likely to be driven mainly by the demand for judicial service. The first reason is that the volume of incumbent judges is sufficient and there is no shortage of judges. Secondly, incoming cases have not exceeded a judge's capacity. Hence, increasing caseload is not a major concern, and policymakers do not have to rush to lower caseload pressure per judge.

Apart from that, if a rise in the number of cases resolved goes at the cost of the quality of court decisions, there is a need to spend resources on personnel although it does not boost court productivity. However, there is no significant relationship between court output and the quality of judicial decisions as well. Therefore, the study suggests that when taking measures to increase court productivity, there is no need to worry too much that it will adversely affect the quality of court decisions. Instead, other policy instruments, including judicial training, improvement in the legal research base, and access to relevant material, such as commentaries and high-quality, peer-reviewed legal articles, could be more effective to enhance the quality of judgments.

In the long run, the administrators of the judiciary should set the weighted caseload system, which assesses the judicial workload and determine how many judges are more appropriate and efficient in each jurisdiction. It could help to rationalize the distribution of judicial budgets and human resources.

5.3. Limitation of Study and Recommendation for Future Studies

Determinants of judicial performance are highly complicated, and numerous

factors might affect court performance, such as budget allocation, procedural law, available technology, and facilities. This paper has concentrated on only two factors of court productivity: the number of judges and caseload size because of data constraints. Despite the fixed effects estimation which mitigates omitted variables bias, these omitted factors are a concern of this study.

Future studies would be carried out using surveys or interviews with judges and administrator managers to identify whether judges work overtime to deal with growing incoming cases on time, and how often they work overtime. Moreover, the reasons why the quality of the decisions does not improve even if the caseload per judge is reduced should be studied in more detail. Judges may also differ in how much time they spend on what, such as writing judgments, leisure, lecture, study, and adjudication. Besides, research examining how the number of assistants to the judge and their efforts influence court productivity should be conducted.

Generally, an in-depth study of the quality of court decisions and the factors that affect them is needed. This study used only the reversal ratio as a measurement of the quality of court decisions. Indeed, it can be measured by many aspects, including the number of hearings, proceeding duration, length or page of written judgments, and the number of witnesses. Thus, if future research considers comprehensive measurements of judicial quality, it would be effective. Besides, other factors that might affect the quality of court decisions, including judges' education level, experience, and training, should be investigated as independent variables in the future.

Bibliography

- Achenchabe, Y., & Akaaboune, M. (2021). Determinants of Judicial Efficiency in Morocco. Open Journal of Business and Management, 9(5), 2407-2424.
- Adler, A. L. (2014). Extended vacancies, crushing caseloads, and emergency panels in the federal courts of appeals. *J. App. Prac. & Process, 15*, 163.
- Albers, P. (2011). Performance indicators and evaluation for judges and courts. *European Commission for the Efficiency of Justice*, 1-14.
- Gramckow, H., & Allen, F. (2011). Justice Sector Reform in Mongolia: Looking Back, Looking Forward.
- Antle, J. M., & Capalbo, S. M. (1988). An introduction to recent developments in production theory and productivity measurement. Agricultural productivity: Measurement and explanation, 17-95.
- Baltagi, B. H., & Baltagi, B. H. (2008). *Econometric analysis of panel data* (Vol. 4). Chichester: John Wiley & Sons.
- Beenstock, M., & Haitovsky, Y. (2004). Does the appointment of judges increase the output of the judiciary? *International Review of Law and Economics*, 24(3), 351-369.
- Bełdowski, J., Dąbroś, Ł., & Wojciechowski, W. (2020). Judges and court performance: a case study of district commercial courts in Poland. *European Journal of Law and Economics*, 50, 171-201.
- Bhagat, R. S., McQuaid, S. J., Lindholm, H., & Segovis, J. (1985). Total life stress: A multimethod validation of the construct and its effects on

organizationally valued outcomes and withdrawal behaviors. *Journal of Applied Psychology*, 70(1), 202.

- Bhattacharya, M., & Smyth, R. (2001). Aging and productivity among judges: Some empirical evidence from the High Court of Australia. *Australian Economic Papers*, 40(2), 199-212.
- Bruggen, A. (2015). An empirical investigation of the relationship between workload and performance. *Management Decision*.
- Buscaglia, E., & Ulen, T. (1997). A quantitative assessment of the efficiency of the judicial sector in Latin America. *International Review of Law and Economics*, 17(2), 275-291.
- Carrington, P. D. (1968). Crowded dockets and the courts of appeals: the threat to the function of review and the national law. *Harv. L. Rev.*, 82, 542.
- Castro, A. S. d. (2009). Court performance in Brazil: Evidence from judicaturelevel data. *Available at SSRN 2612941*.
- Castro, M. F., & Guccio, C. (2014). Searching for the source of technical inefficiency in Italian judicial districts: an empirical investigation. *European Journal of Law and Economics*, *38*(*3*), 369-391.
- Castro, M. F., & Guccio, C. (2015). Bottlenecks or inefficiency? An assessment of first instance Italian courts' performance. *Review of Law & Economics*, 11(2), 317-354.
- Christensen, R. K., & Szmer, J. (2012). Examining the efficiency of the US courts of appeals: Pathologies and prescriptions. *International Review of Law and Economics*, *32*(*1*), 30-37.

- Cooter, R. D. (1983). The objectives of private and public judges. *Public Choice*, 107-132.
- Dakolias, M. (1999). *Court performance around the world: a comparative perspective* (Vol. 23). World Bank Publications.
- Dalton, T., & Singer, J. M. (2014). Bigger isn't always better: An analysis of court efficiency using hierarchical linear modeling. *Pace L. Rev.*, *34*, 1169.
- De Sousa, M., & Schwengber, S. (2005). Efficiency estimates for judicial services in Brazil: Nonparametric FDH (Free Disposal Hull) and the expected order-M efficiency scores for Rio Grande Do Sul courts. *Encontro da anpec, 33th.*
- Deyneli, F. (2012). Analysis of relationship between efficiency of justice services and salaries of judges with two-stage DEA method. *European Journal of Law and Economics*, 34(3), 477-493.
- Dimitrova-Grajzl, V., Grajzl, P., Sustersic, J., & Zajc, K. (2012). Court output, judicial staffing, and the demand for court services: Evidence from Slovenian courts of first instance. *International Review of Law and Economics*, 32(1), 19-29.
- Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). Courts: The lex mundi project.
- Elbialy, N., & Garcia-Rubio, M. A. (2011). Assessing judicial efficiency of Egyptian first instance courts: A DEA analysis(No. 19-2011). MAGKS joint discussion paper series in economics.
- Engel, C., & Weinshall, K. (2020). Manna from Heaven for Judges: Judges'

Reaction to a Quasi-Random Reduction in Caseload. *Journal of Empirical Legal Studies*, *17*(4), 722-751.

- Engel, C., & Zhurakhovska, L. (2017). You are in charge: Experimentally testing the motivating power of holding a judicial office. *The Journal of Legal Studies*, *46*(*1*), 1-50.
- Falavigna, G., & Ippoliti, R. (2021). Reform policy to increase the judicial efficiency in Italy: The opportunity offered by EU post-Covid funds. *Journal of Policy Modeling*, 43(5), 923-943.
- Falavigna, G., Ippoliti, R., Manello, A., & Ramello, G. B. (2015). Judicial productivity, delay and efficiency: A Directional Distance Function (DDF) approach. *European Journal of Operational Research*, 240(2), 592-601.
- Fauvrelle, T. A., & Almeida, A. T. C. (2018). Determinants of judicial efficiency change: Evidence from Brazil. *Review of Law & Economics*, 14(1).
- Ferro, G., Romero, C. A., & Romero-Gómez, E. (2018). Efficient courts? A frontier performance assessment. *Benchmarking: An International Journal*.
- Friedman, I. A., & Mann, L. (1993). Coping patterns in adolescent decision making: An Israeli-Australian comparison. *Journal of adolescence*, 16(2), 187-199.
- Gomes, A. O.Guimarães, T. A., & Akutsu, L. (2017). Court caseload management: the role of judges and administrative assistants. *Revista de Administração Contemporânea, 21*, 648-665.

Gorman, M. F., & Ruggiero, J. (2009). Evaluating US judicial district prosecutor

performance using DEA: are disadvantaged counties more inefficient? European Journal of Law and Economics, 27(3), 275-283.

- Grant, R. M. (1991). The resource-based theory of competitive advantage: implications for strategy formulation. *California management review*, 33(3), 114-135.
- Hausman, Jerry A. "Specification tests in econometrics." *Econometrica: Journal* of the econometric society (1978): 1251-1271.
- Heaton, P., & Helland, E. (2011). Judicial expenditures and litigation access: Evidence from auto injuries. *The Journal of Legal Studies*, 40(2), 295-332.
- Helland, E., & Klick, J. (2007). The effect of judicial expediency on attorney fees in class actions. *The Journal of Legal Studies*, *36*(1), 171-187.
- Henisz, W. J. (2000). The institutional environment for economic growth. Economics & Politics, 12(1), 1-31.
- Holmstrom, B., & Milgrom, P. (1991). Multitask principal-agent analyses:
 Incentive contracts, asset ownership, and job design. *JL Econ. & Org.*, 7, 24.
- Ippoliti, R., & Tria, G. (2020). Efficiency of judicial systems: model definition and output estimation. *Journal of Applied Economics*, *23*(*1*), 385-408.
- Iyaniwura, O., & Osoba, A. (1983). Measuring productivity; conceptual and statistical problems: Improvement of statistics. In *Productivity in Nigeria Proceedings of a National Conference NISER, Ibadan.*
- Jamiyanjav, A. (2018). Report of research to determine caseload per judge in Mongolia.

- Jonski, K., & Mankowski, D. (2014). Is Sky the Limit-Revisiting Exogenous Productivity of Judges Argument. In *IJCA* (Vol. 6, p. 53).
- Judicial Annual Reports. (2020, March 16). Judicial General Council of Mongolia. Retrieved from Judicial General Council of Mongolia: http://www.judcouncil.mn/site/news_full/10084
- Kim, D., & Min, H. (2017). Appeal rate and caseload: Evidence from civil litigation in Korea. *European Journal of Law and Economics*, 44(2), 339-360.
- Kittelsen, S. A., & Førsund, F. R. (1992). Efficiency analysis of Norwegian district courts. *Journal of Productivity Analysis*, 3(3), 277-306.
- Langbroek, P., Dijkstra, R., Bozorg Zadeh, K., & Türk, Z. (2017). Performance management of courts and judges: Organizational and professional learning versus political accountabilities. In *Handle with care: Deliverable 3.1: Report-Performance management of courts and judges: Organizational and professional learning vs political accountability* (pp. 297-325).
- Larsen, R. P. (2001). Decision making by military students under severe stress. *Military Psychology*, *13*(2), 89-98.
- Levitt, M. S., & Joyce, M. (1987). The growth and efficiency of public spending.
- Lewin, A. Y., Morey, R. C., & Cook, T. J. (1982). Evaluating the administrative efficiency of courts. *Omega*, *10*(*4*), 401-411.
- Long, B. C., Kahn, S. E., & Schutz, R. W. (1992). Causal model of stress and coping: Women in management. *Journal of counseling psychology*, 39(2),

- Luskin, M. L., & Luskin, R. C. (1986). Why so fast, why so slow: Explaining case processing time. J. Crim. L. & Criminology, 77, 190.
- Marciano, A., Melcarne, A., & Ramello, G. B. (2019). The economic importance of judicial institutions, their performance and the proper way to measure them. *Journal of Institutional Economics*, *15*(*1*), 81-98.
- Martinez, J. (1993). Reinventing Government: How the Entrepreneurial Spirit Is Transforming the Public Sector. *In: JSTOR*.
- Melcarne, A., & Ramello, G. B. (2015). Judicial independence, judges' incentives and efficiency. *Review of Law & Economics*, *11*(2), 149-169.
- Merelman, D., Lynn, C. S., Romick, S., Thibault, J., Murphy, W., Codinha, J.W., ... & Domuracki, M. A. (1997). Stressed. *Forbes*, *159*(11), 20-21.
- Mitsopoulos, M., & Pelagidis, T. (2007). Does staffing affect the time to dispose cases in Greek courts? *International Review of Law and Economics*, 27(2), 219-244.
- Mitsopoulos, M., & Pelagidis, T. (2010). Greek appeals courts' quality analysis and performance. *European Journal of Law and Economics*, *30*(*1*), 17-39.
- Murrell, P. (2001). Demand and supply in Romanian commercial courts: Generating information for institutional reform. *Available at SSRN* 280428.
- Nagel, S., Neef, M., & Munshaw, N. (1978). Bringing management science to the courts to reduce delay. *Judicature*, 62, 128.

- Ng, G. Y., Velicogna, M., & Dallara, C. (2020). EUROPEAN COMMISSION FOR THE EFFICIENCY OF JUSTICE (CEPEJ).
- Norris, S. (2018). Judicial errors: Evidence from refugee appeals. University of Chicago, Becker Friedman Institute for Economics Working Paper, 75.
- North, D. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge University Press.
- Oyeranti, G. A. (2000). 1 CONCEPT AND MEASUREMENT OF PRODUCTIVITY BY.
- Pedraja-Chaparro, F., & Salinas-Jimenez, J. (1996). An assessment of the efficiency of Spanish Courts using DEA. *Applied economics*, 28(11), 1391-1403.
- Pettigrew, S. M., & Stras, D. R. (2010). The Rising Caseload in the Fourth Circuit: A Statistical and Institutional Analysis. South Carolina Law Review, 61(3), 10-15.
- Peyrache, A., & Zago, A. (2016). Large courts, small justice!: The inefficiency and the optimal structure of the Italian justice sector. *Omega*, *64*, 42-56.
- Posner, R. A. (1993). What do judges and justices maximize?(The same thing everybody else does). *Supreme Court Economic Review*, *3*, 1-41.
- Posner, R. A. (2000). Is the ninth circuit too large? A statistical study of judicial quality. *The Journal of Legal Studies*, *29*(2), 711-719.
- Rachlinski, J. J., Johnson, S. L., Wistrich, A. J., & Guthrie, C. (2008). Does unconscious racial bias affect trial judges. *Notre Dame L. Rev.*, 84, 1195.

- Ramsever, J. M. (2012). Talent matters: Judicial productivity and speed in Japan. International Review of Law and Economics, 32(1), 38-48.
- Richman, W. M., & Reynolds, W. L. (2013). Injustice on appeal: The United States courts of appeals in crisis. Oxford University Press.
- Rosales-López, V. (2008). Economics of court performance: an empirical analysis. European Journal of Law and Economics, 25(3), 231-251.
- Santos, S. P., & Amado, C. A. (2014). On the need for reform of the Portuguese judicial system-Does Data Envelopment Analysis assessment support it? *Omega*, 47, 1-16.
- Schneider, M. R. (2005). Judicial career incentives and court performance: an empirical study of the German labour courts of appeal. European Journal of Law and Economics, 20(2), 127-144.
- Shavell, S. (1995). The appeals process as a means of error correction. The Journal of Legal Studies, 24(2), 379-426.
- Siu, O. l. (2003). Job stress and job performance among employees in Hong Kong: The role of Chinese work values and organizational commitment. International journal of psychology, 38(6), 337-347.
- Staats, J. L., Bowler, S., & Hiskey, J. T. (2005). Measuring judicial performance in Latin America. Latin American Politics and Society, 47(4), 77-106.
- Strategic Plan. (2020, March). Judicial General Council of Mongolia. Retrieved from Judicial of Mongolia: General Council http://www.judcouncil.mn/site/status_page/stratek
- Tulkens, H. (2006). On FDH efficiency analysis: some methodological issues and 83

applications to retail banking, courts and urban transit. In *Public goods, environmental externalities and fiscal competition* (pp. 311-342). Springer.

- Viapiana, F. (2018). Pressure on Judges: How the Budgeting System Can Impact on Judge's Autonomy. *Laws*, 7(4), 38.
- Voigt, S., & El-Bialy, N. (2016). Identifying the determinants of aggregate judicial performance: taxpayers' money well spent? *European Journal of Law and Economics*, 41(2), 283-319.
- Webber, D. (2007). Good budgeting, better justice: modern budget practices for the judicial sector. World Bank Legal Vice Presidency.
- Weder, B. (1995). Legal systems and economic performance: the empirical evidence. World Bank, Judicial Reform in Latin America and the Caribbean, 21-26.
- Westman, M., & Eden, D. (1996). The inverted-U relationship between stress and performance: A field study. *Work & Stress*, *10*(2), 165-173.
- World Bank. (2008). Bulgaria: Resourcing the Judiciary for Performance and Accountability. *Report no. 42159-BG*.
- Yeung, L. (2014). Measuring Efficiency of Courts: An Assessment of Brazilian Courts Productivity. In *Managing Service Productivity* (pp. 155-165). Springer. Berlin, Heidelberg.
- Yeung, L. (2020). Measuring efficiency of Brazilian courts: one decade later. *Revista de Direito Administrativo*, 279(1), 111-134.
- Yeung, L. L., & Azevedo, P. F. (2011). Measuring efficiency of Brazilian courts with data envelopment analysis (DEA). *IMA Journal of Management*

Mathematics, 22(4), 343-356.

Fixed Effect Model				
Dependent variable - Resolve	d cases			-
	Estimate	Standard Error	Pr> t	-
Judges	2.368	4.929	0.631	
Caseload	0.722	0.016	<.0001	***
No.obs	524			-
R-squared	0.99			
Pr>F	<.0001			_
Random Effect Model				-
Dependent variable - Clearan	ce rate			-
	Estimate	Standard Error	Pr> t	
Judges	-0.995	0.232	<.0001	***
Caseload per judge	-0.006	0.005	0.22	_
No.obs	632			_
R-squared	0.46			_
Random Effect Model				-
Dependent variable - Reversa	l ratio			-
	Estimate	Standard Error	Pr > t	-
Caseload per judge	-0.028	0.012	0.021	**
Resolved cases	0	0	0.338	_
No.obs	443			-
R-squared	0.28			

Appendix

*** significant at <.0001; ** significant at <0.05;

Random Effect Mo	Random Effect Model			
Dependent variable	Dependent variable - Resolved cases			
	Estimate	Standard Error	Pr > t	
Judges	2.44	3.74	0.51	
Caseload	0.64	0	<.0001***	
No.obs	632			
R-squared	0.97			
Pr>F	<.0001			
Fixed Effect Model				
Dependent variable	- Clearance	rate		
	Estimate	Standard Error	Pr > t	
Judges	-0.92	0.51	0.07	
Caseload per judge	-0.01	0	0.06	
No.obs	524			
R-squared	0.73			
Fixed Effect Model	Fixed Effect Model			
Dependent variable	Dependent variable - Reversal ratio			
	Estimate	Standard Error	Pr > t	
Caseload per judge	-0.02	0.018	0.245	
Resolved cases	0	0.002	0.85	
No.obs	350			
R-squared		0.65		

국문초록

몽골의 법정생산성에 미치는 사건부하와 법정규모의 영향

Odmaa Dorjnamjim 서울대학교 행정대학원 글로벌행정전공

법원 실적과 법원 판결의 질을 개선하기 위한 효과적인 방법에 관한 논 의가 지속되고 있다. 사법 효율성에 관한 빈번한 정책적 가정은 사법 인 력 충원을 더 생산적이고, 법원 생산량을 더 증가시킬 수 있다는 것이다. 그러나 일부 이론적 견해와 최근의 경험적 연구는 이 가정을 의심하고 있다.

본 연구는 법원 생산성의 결정 요인을 이해하는 데 집중하였다. 첫째, 법원의 생산성을 설명하기 위해 판사 수와 사건량의 영향을 조사하였다. 둘째, 해결된 사건의 양이 법원 판결의 질에 미치는 영향을 살펴보았다. 몽골 사법 행정부 2차 데이터를 수집하여 무작위 및 고정 효과 회귀 분 석을 시행하였다. 선행연구 및 활용 가능한 자료를 바탕으로 해결사건의 수, 정리율 등을 법원 실적 지표로 선정한 후, 상급법원에서 번복 또는 변경된 법원 판결의 수를 활용해 법원 판결의 질을 판단하였다. 연구 가 설과 연구 결과의 해석은 사법적 행동을 설명하는 합리적 선택 이론에 기초하였다.

몽골 사법부는 (1) 법원의 판사 수가 사건 해결 수준이나 처리율 및 청 산률에 부정적인 영향을 미친 것으로 나타났으며, (2)대조적으로, 법원 서비스에 대한 요구는 소송 처분의 핵심 결정 요소이고 이는 소송 부담

압력이 법정 산출물을 증가시킨다는 것을 의미한다. (3)법원 판결의 질 은 주어진 기간에 해결된 소송의 수와 관련이 없다. 흥미롭게도, 판사 한 명당 소송 부담은 심지어 결정의 질에 부정적인 영향을 미친다. 일반 적으로 판사의 생산성은 내생적이라는 결론이 나온다. 법관 수가 늘었다 고 해서 법원 생산성이 높아지는 것은 아니지만, 많은 사건을 담당할수 록 법관의 노력이 많아져 법원 생산성이 높아지는 것이다.

주요 키워드: 사건부하, 재판관 수, 해결된 사건 수, 판결의 질

Acknowledgement

First and foremost I would like to express my gratitude and respect to my advisor, Professor Bong Hwan Kim who always guides me with patience. His kind encouragement and valuable advice were keys to the successful completion of this study. To my thesis panel members, Professor Sooyoung Lee and Professor Chongmin Na, thank you for your constructive comments and suggestions.

The assistance provided by Ph.D. candidate Mr. Si Young Lee was greatly appreciated. Without his deep statistical knowledge and unending support, I would have faced many tough obstacles.

I wish to extend my special thanks to my best friends, Camilo Varon Villalobos and Chintana Sengsoulin, for discussing and sharing our thoughts during our academic journey.

I am so grateful to my colleague and friends who sincerely helped me to collect data and provided insightful comments, Ankhbayar Batmunkh and Itgeltugs Altansukh.

Finally, to the Seoul National University, thank you for all the opportunities and support that have been given to me to learn.