Justice Delayed: A District-Wise Empirical Study on Indian Judiciary

—Varsha Aithala*, Rathan Sudheer**&
Nandana Sengupta***

Is there an association between socioeconomic development and case pendency in lower courts of India? We aim to answer this using a novel data set constructed by merging district-level socioeconomic data with case pendency figures scraped from India's National Judicial Data Grid. We find that pendency rates have a stronger association with economic indicators than sociodemographic ones. Improvement in economic factors has a negative relationship on the proportion of cases pending over 10 years in district courts. Significant associations exist between sociodemographic measures like improved education and employment levels on pendency. Important district-level differences are observed corresponding to differences in proportions of population belonging to various social groups. This study is motivated by literature worldwide showing that economic growth reduces case pendency and a positive relationship exists between economic development, social growth and litigation activity. We add to this literature using findings from a large dataset to a scale not conducted previously in India.

Keywords: district courts, litigation, pendency, development, economic growth, judiciary, data grid

I. Introduction

Over the last few years, there has been increasing interest and discussions around the requirement of data to measure judicial efficiency and to better understand the interlinkages between judicial efficiency and socioeconomic factors.

---

*   Varsha Aithala is a Ph.D. student at the National Law School of India University.
**   Rathan Sudheer is currently working as a Research Associate at the Energy Policy Institute at the University of Chicago - India.
***   Dr. Nandana Sengupta is currently the Assistant Professor, School of Public Policy, Indian Institute of Technology, Delhi.

The highly publicised electronic courts (eCourts) Integrated Mission Mode project of the Indian Government aims to provide comprehensive case-related information to all citizens through enhanced information technology infrastructure at courts.[1] Case related information like registration number, cause list, case status, daily orders and final judgments is fed from courts to a National Judicial Data Grid ('**NJDG**'), accessible online to anyone.[2] This monitors case pendency and acts as a repository of case-related information and key performance indicators across lower courts on a real-time basis.

Despite these measures, a wide gap in research and scholarship exists on case pendency using strong empirical data in India. We use district-level judicial pendency data from the NJDG as a first attempt towards rigorous empirical analysis of associations between socioeconomic indicators and pendency. The lack of judicial filing data in the NJDG limits us to use pendency as a proxy in our analysis.

Pendency data is also closely related to filing rate (namely, the total number of new cases filed in the current period). Chemin defines pendency as the total of filing rate and pending cases from the previous period, divided by resolved cases in the current period.[3] Micevska & Hazra analyse pendency using caseload per capita and caseload per judge as indicators.[4] They find a positive and significant effect of filing rate on caseload and a negative effect on the congestion rate. They recommend that to reduce the backlog, filing rates need to be reduced and long pending cases resolved. Clemenz & Gugler point out that civil litigation is 'strongly self-reinforcing' and 'sticky' and 'once built-up', litigation level is 'not likely to decrease substantially very quickly', leading to larger pendency rates.[5] Filing rates are in turn, a function of several factors including the population and their levels of income, education and legal awareness.

Research on the association between social, economic factors and litigiousness extends to the 1970s. Early work by Marc Galanter using studies conducted in Germany and Britain, suggests that economic growth manifested in more businesses and more governmental activity, which in turn led to greater litigation

[1]   National Council of Applied Economic Research, Department of Justice, Ministry of Law and Justice, New Delhi: Government of India, *Evaluation Study of eCourts Integrated Mission Mode Project* (2015) 16.

[2]   Ministry of Law and Justice, New Delhi: Government of India, *National Judicial Data Grid*, <https://njdg.ecourts.gov.in/njdgnew/index.php> accessed 28 January 2021.

[3]   M. Chemin, 'The Impact of the Judiciary on Economic Activity' (2007) Cahiers de recherche 0724 CIRPEE 15-16.

[4]   M.B. Micevska & A.K. Hazra, 'The Problem of Court Congestion: Evidence from Indian Lower Courts' (2004) ZEF – Discussion Papers on Development Policy No. 88, Bonn: Center for Development Research 21.

[5]   G. Clemenz & K. Gugler, 'Macroeconomic Development and Civil Litigation' (2000) 9(3) European Journal of Law and Economics 215, 222-223.

activity.[6] Loon & Langerwerf review some of the early attempts to develop a general theoretical basis to analyse the influence of social change on litigation.[7] Wollschläger remarks "... the more contracts are signed, the more contracts can be broken. Consequently, economic growth must *ceteris paribus* increase the workload of civil courts." He reported on civil litigation in 35 countries in 1998 to conclude that low litigation rates in Ethiopia, Nepal, Paraguay, Solomon Islands may be attributable to economic underdevelopment.[8]

These relationships have been explored empirically in several geographies. Loon & Langerwerf conduct a regression analysis of filing rates of civil cases in Belgium from 1835–1980 to find a positive relationship between socioeconomic development and litigation rates.[9] Clemenz & Gugler use regression analysis on aggregate civil cases filed in courts in Austria each year between 1960–1995 and suggest that economic transactions per individual, proxied by the level of real per capita Gross Domestic Product ('**GDP**'), is a positive determinant of the amount of litigation per capita.[10]

Ginsburg & Hoetker using empirical analysis of civil case filings at district courts in 47 Japanese prefectures for 1986 – 2001, observe that institutional changes like expansion of the bar, procedural and substantive law reform and structural changes to the economy improved litigation per capita.[11] Based on analysis of secondary annual time series data collected from 1960 – 2016, Marang'a, Kosimbei & Ouma find that increased funding to judicial institutions, economic growth and faster resolution of cases reduced congestion in Kenyan courts.[12] In periods of economic growth, parties can easily fulfil their obligations, breaking fewer contracts and so, leading to less litigation and consequently, lower congestion. Parties from prosperous economies have a higher ability to pay potential litigation costs and so, speed up cases.

---

[6]   M. Galanter, 'Front Matter: Litigation and Dispute Processing: Part Two' (1975) Law & Society Review 9(2) 163-164.

[7]   F.V. Loon & E. Langerwerf, 'Socioeconomic Development and the Evolution of Litigation Rates of Civil Courts in Belgium, 1835–1980: Longitudinal Studies of Trial Courts' (1990) 24(2) Law & Society Review 283-4. The authors review the work of Grossman & Sarat (1975), Baum et al. (1980–81), Daniels (1984–85) on this.

[8]   C. Wollschläger 'Exploring Global Landscapes of Litigation Rates' (1998) Soziologie des Rechts: Festschrift für Erhard Blankenburg zum 60 Geburtstag 577, 582.

[9]   F.V. Loon & E. Langerwerf, 'Socioeconomic Development and the Evolution of Litigation Rates of Civil Courts in Belgium, 1835 – 1980: Longitudinal Studies of Trial Courts' 1990) 24(2) Law & Society Review 291-92.

[10] G. Clemenz & K. Gugler, 'Macroeconomic Development and Civil Litigation' (2000) 9(3) European Journal of Law and Economics 215, 222, 228.

[11] T. Ginsburg & G. Hoetker, 'The Unreluctant Litigant? An Empirical Analysis of Japan's Turn to Litigation' (2006) 31(32) Journal of Legal Studies 32.

[12] M. Marang'a, G. Kosimbei & D. Ouma, 'Causes of Congestion in the Justice System: Does Macroeconomic Environment Matter?' (2018) Journal of Economics and Sustainable Development, 9(14) 2222.

Empirical literature from India on the relationship between socioeconomic factors and measures of judicial efficiency is sparse. Kalantry et al., conduct regression analysis of aggregate civil case filings at the lower courts of 28 States and in Delhi, Chandigarh and Puducherry from 2005 –2010 to show that non-economic well-being explains litigation rates patterns better than purely economic measures namely, GDP per capita.[13] Their analysis indicates significant positive correlations between civil filing rates and regions with high GDP per capita, high HDI scores and greater urbanisation. This study has several limitations. The civil filings data for lower courts used for analysis is inconsistent across the period considered, data sources include civil filings data from the Supreme Court's 'Court News' publication and commission reports, socio-economic data from the Census of India, the Ministry of Statistics and Programme Information and the India HDI Report of 2011. As the authors suggest, data from such diverse sources lack uniformity and so, may not be entirely accurate. Their study does not analyse impact on filing rates and pendency levels on different socioeconomic factors including income levels, memberships in social groups etc. District level data on the economy and courts is lacking and instead, state level data is used. The resulting sample size (namely, aggregate lower court civil case filings from 2005-2010) is too small for robust statistical analysis.

Guruswamy & Singh analyse state-wise filing rates in the district, subordinate and high courts for 24 States and Delhi and Andaman & Nicobar for 2008 – 2009, State level poverty rates, literacy rates and Naxal violence.[14] They deduce a negative relationship between poverty and filing rates; a positive relationship between literacy and filing rates; and a negative relation between Naxalite violence and filing rates. Their analysis, however, is not based on any statistical methodology, but rather through visual inspection of aggregate numbers.

A 2016 report on subordinate courts by the Supreme Court used case filing data supplied by 22 High Courts to identify relationships between development indicators like literacy rates, population ratio, HDI and higher case filing rates. It points out inadequate bench strength in subordinate courts as a significant contributor to the progressive accumulation of cases.[15] Linear regression is used to predict future case volumes, but neither the statistical models nor the findings are explained or available in the public domain.

Other studies have observed statistically significant relationships between case pendency and firm-level contracting behaviour and firms' economic

---

[13]   S. Kalantry et al, 'Litigation as a Measure of Well-Being' (2013) 62 DePaul L. Rev 247.

[14]   M. Guruswamy & A. Singh, 'Village Courts in India: Unconstitutional Forums with Unjust Outcomes'(2010) 3(3) Journal of Asian Public Policy 281.

[15]   Supreme Court of India (2016), *Subordinate Courts of India: A Report on Access to Justice*, New Delhi: Centre for Research & Planning.

performance.[16] Our focus is different - we do not review specific industry sectors or firm level behaviour. Our analysis is at the aggregate pendency level for individual litigants in district courts. We observe that the empirical basis of litigation behaviour and in particular, case pendency and its association with social and economic factors, is largely understudied and detailed macro-level analysis is lacking.

We choose to examine lower courts' case data because they form the first point of institutional contact for an aggrieved individual for grievance redress. There are 672 district courts in India. Lower courts, 'provide the most thorough measure of litigation activity'.[17]

Past work in this area in India is limited by lack of data on court congestion, pendency and performance of lower courts organised in a systematic and easily accessible format online. Our approach is novel and inter-disciplinary. To overcome the data gap, we use publicly accessible data from NJDG on civil and criminal cases filed and pending; demographic information from the annual population Census of India, 2011. Our study is innovative because of a) generation of unique district level pan-India dataset using web scraping and b) ability to do meaningful statistical analysis due to the large sample size. By focussing attention on pendency and litigation activity at district courts, we can control for other district-level influences and provide strong empirical evidence beyond that conducted in India so far. We examine the relationship between pendency and socioeconomic and structural factors including, (i) judicial factors – number of judges per court and courts per district; (ii) economic factors - per capita GDP, degree of urbanisation, household assets ownership, proportion of working population; and (iii) social factors - age, education, literacy levels, social identities based on caste, religion and gender of litigants.

While we trace the association between socioeconomic factors and proportion of pendency, we do not indicate any causal relationships between them. Our analysis could help understand whether India's economic performance will promote better functioning of our courts. Our objective is to show the utility of better designed statistical analysis methods and to initiate further research on the critical problem of judicial delays. There is immense potential for case data collection and analysis to be automated in the future, enhancing the speed, reliability and effectiveness of future studies assessing the performance of Indian judiciary.

---

[16]   A. Amirapu, 'Justice Delayed is Growth Denied: The Effect of Slow Courts on Relationship-Specific Industries in India'(2017) School of Economics Discussion Papers, University of Kent, KDPE 1706; M. Chemin, 'Does Court Speed Shape Economic Activity? Evidence from a Court Reform in India' (2012) 28(3) Journal of Law, Economics & Organization 460.

[17]   S. Kalantry et al, 'Litigation as a Measure of Well-Being' (2013) 62 DePaul L Rev 258.

The paper is organised as follows. **Section II** describes the data sources in detail, followed by descriptive statistics in **Section III** and our empirical strategy in **Section IV**. **Sections V** and **VI** present the results and findings and discuss directions for future research.

II. Data

Data we use on court pendency rates is accessed from the NJDG by web scraping on 13 July 2018 for 615 districts over 31 States. NJDG includes variables only as a proportion of the number of cases pending in the lower courts. Our use of pendency as a proxy for filing is limited by the data compiled in the NJDG during the review period. Our primary variables of interest are the proportion of cases pending for more than 10 years, proportion of pending cases classified as criminal and proportion of pending cases filed by women and senior citizens.

For demographic data, we use district-wise population levels, literacy rate, proportion of the working population, education levels and gender and age profiles as our social variables. We merge the Census data of 2011 with judicial data by matching State and district names. Since the district-wise data from the Census was much older, we account for name changes and new district and state formation. We continue to use districts from Telangana as part of Andhra Pradesh. Judicial data specifies 'Port Blair' as the only district in Andaman and Nicobar Islands in contrast to three (the Nicobars, North & Middle Andaman and South Andaman) recorded in the Census. To account for this, we assume Andaman and Nicobar Islands to have only one district consisting of the entire Union Territory's demographic. After accounting for these changes and known changed district names, we drop 43 district names from the judicial dataset which remain unmatched with the Census. Since Ukhrul district of Manipur has no courts and adds no value to our analysis, we drop this too.

The economic data of district-wise GDP per capita is from the Planning Commission for 2004- 2005 at 1999 - 2000 base prices. GDP data for Uttarakhand, Delhi and Tripura is from the Ministry of Statistics and Programme Implementation ('**MOSPI**') which was missing in the Planning Commission data.[18] We were unable to obtain district wise GDP data for Gujarat, Jammu and Kashmir, Chandigarh, Diu and Daman, Dadra & Nagar Haveli at Silvassa, and Goa and hence these were dropped. As a proxy for an economic indicator, we also use the household asset ownership information from the Census data.[19] This shows the proportion of households in a district having television,

---

[18]   Ministry of Statistics and Programme Implementation, New Delhi: Government of India, *State Domestic Product and Other Aggregates, 2004–05 Series* (2005) <https://niti.gov.in/planningcommission.gov.in/docs/data/datatable/index.php? data=datatab> accessed 28 January 2021.

[19]   Ministry of Home Affairs, New Delhi: Government of India, Tables on Houses, Household Amenities and Assets (2011) <https://censusindia.gov.in/DigitalLibrary/MFTableSeries.aspx> accessed 2 February 2021.

computer, telephone/mobile phone and scooter/car. After accounting for State and district name changes since Census 2011 and availability of district level GDP data, our final dataset covers a total of 496 districts over 25 States.

III. Descriptive Statistics

Table 1 summarises our judicial, demographic and economic indicators. The mean number of courts per lakh of the population in a given district is less than one or put another way, an average district court services 1.65 lakh individuals. On average, a district has 4 judges per court. Of the total pending cases filed in a district, only 11.5% are filed by women, on average. The mean proportion of cases filed by senior citizens is even lower at 5.3%. An average 67.6% of all pending cases in a given district are criminal, and the remaining are civil. Mean proportion of all cases pending for more than ten years is around 5.5%.

The mean sex ratio in the sample districts is 1.056, meaning for every 1000 females, there is, on average, additional 56 males. While the average proportion of the literate population is 62.6%, only 20.5% of people have education levels of matriculation and above. As expected, there is gender disparity in education: the mean proportion of literate women is 55.3% with only 16.5% of women above matriculation level. Mean proportion of the Adivasi population is 12.1% and of Dalit population is 17%. The mean proportion of the working population (marginal and main workers) is 41.1%, with just 28.1% of working women on average. The mean dependency ratio is 0.671. Dependents are the proportion of the population aged less than 15 years and over 60 years. Dependency ratio is the ratio of proportion of dependents in the population to the proportion of the working-age population. Thus, for every 100 people in the working-age, there are 67 dependents in the sample. The mean asset indicator is 0.037, so only 3.7% of households in the sample on an average have the defined assets. The mean GDP per capita in the sample is INR 18,400.

Figure 1 shows State-wise summaries for four case pendency variables. We observe that States have very few cases pending for more than 10 years and a majority have less than 15% proportion of pending cases filed by women and senior citizens. Proportion of pending cases classified as criminal is the highest, at more than 50%, in most States.

Figure 1A shows the proportion of all cases pending for over 10 years. Meghalaya has the highest proportion with around 20%, followed by Bihar, Orissa, Uttar Pradesh and West Bengal. **Figure 1B** shows the state-wise proportion of pending cases which are criminal. Jharkhand and Orissa have the largest proportion of pending cases classified as criminal, greater than 75%, with

Uttarakhand and Assam close behind. Tamil Nadu and Manipur (at 32.5%) are the only States with the proportion of pending cases which are criminal less than 50%.

Figures **1C** and **1D** show the proportion of pending cases filed by women and senior citizens, respectively. Meghalaya has the highest proportion of pending cases filed by women and very low proportions of pending cases filed by seniors. Proportion of cases filed by senior citizens in Andamans is nearly 0%. Orissa has the lowest proportion of pending cases filed by women. Among the North Eastern States, Mizoram does relatively worse on both categories. From **Figures 1C and 1D**, we see that the proportion of pending cases filed by women and seniors is extremely low. Moog lists out the relative inaccessibility of courts and the persistent feeling among disputants that the courts are more trouble than worth as likely reasons for most Indians' preference to not use courts to resolve disputes if a viable alternative is present.[20] Women and senior citizens tend to file fewer cases than working-age men, and so this feeling may be particularly applicable to litigants belonging to these vulnerable groups, who tend to approach formal courts only as a last resort.

Table 1: Summary Statistics

Type	Statistic	Mean	Std. Dev.
Judicial Data	Number of courts per lakh	0.605	0.601
	Number of Judges per court	4.5	3.903
	Proportion of pending cases filed by women	0.115	0.049
	Proportion of pending cases filed by senior citizens	0.053	0.042
	Proportion of pending criminal cases	0.676	0.171
	Proportion of cases pending over 10 years	0.055	0.065
	Sex Ratio	1.056	0.061
	Proportion of literates	0.626	0.102
	Proportion of population above matriculation	0.205	0.09
	Proportion of Adivasi population	0.121	0.197
	Proportion of Dalit population	0.17	0.08

---

[20]   R. Moog, 'Indian Litigiousness and the Litigation Explosion: Challenging the Legend' (1993) 33(12) Asian Survey 1138, 1149.

| Type	Statistic	Mean	Std. Dev.
Social Data	Proportion of literate women	0.553	0.121
	Proportion of women above matriculation	0.165	0.091
	Proportion of population above the age of 60	0.086	0.02
	Dependency Ratio	0.671	0.131
Economic Data	Per Capita GDP (x ₹ 10000)	0.184	0.099
	Asset Indicator	0.037	0.047
	Proportion of working population	0.411	0.069
	Proportion of working women	0.281	0.115
	Proportion of Urban Population	0.258	0.204

Figure 1: state wise summaries
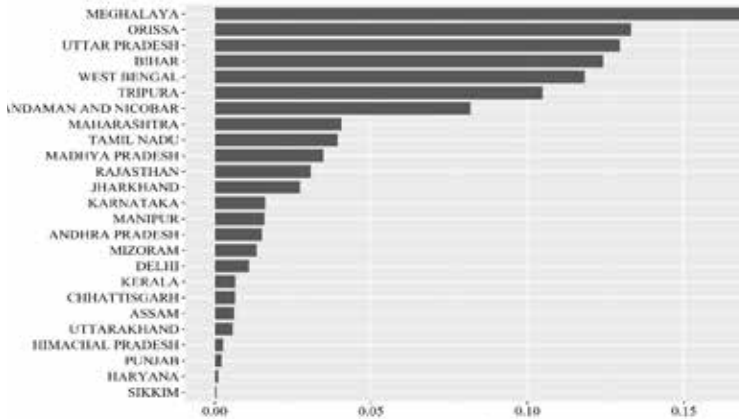
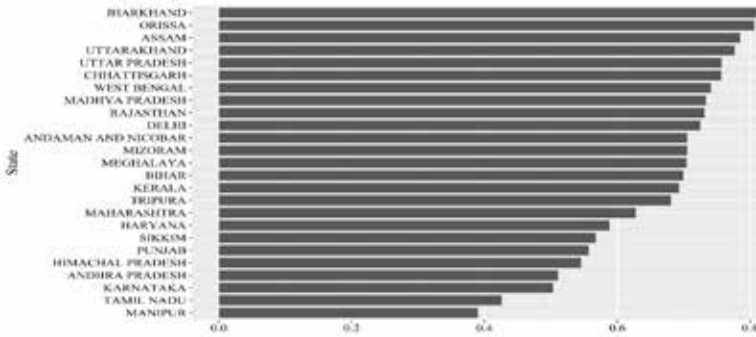Figure 1A. Proportion of cases pending over 10 years

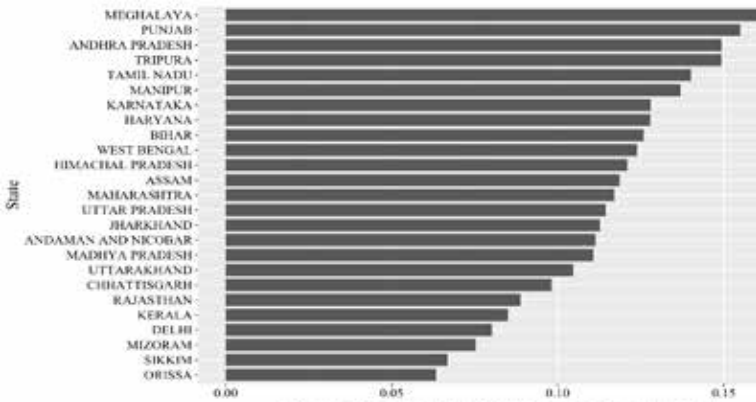Figure 1B. Proportion of pending cases which are classified as criminal

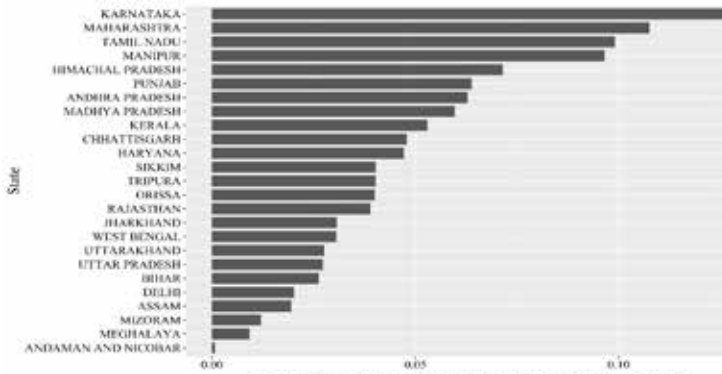Figure 1C. Proportion of pending cases filed by women

Figure 1D. Proportion of pending cases filed by senior citizen

IV. Empirical Strategy

A. Specification

The empirical analysis aims to observe associations between socioeconomic factors and pendency rates.[21] To estimate this relationship, we use ordinary least square regressions. We regress the outcome[22] variables Y on the various demographic and economic variables *X, Z* and *P*:

$$Y = \alpha + \sum_{k} \beta_k X_k + \sum_{j} \gamma_j Z_j + \sum_{i} \delta_i P_i + \varepsilon$$

As discussed before, our analysis is at the district level. We consider four outcomes of interest which are i) proportion of cases pending over 10 years (Y_{10}), ii) proportion of pending cases which are classified as criminal (Y_C); iii) proportion of pending cases filed by women (Y_W) and iv) proportion of pending cases filed by senior citizens (Y_S). Proportions for each of these variables have been calculated over total pending cases. X_k includes sex ratio, proportion of literates, proportion of people who studied till matriculation and beyond, proportion of the

---

[21] The socioeconomic data used is from a different time period than the pendency data since socioeconomic data is typically available at lower frequency for eg, via. decadal census. However, we expect that the associations obtained remain valid, particularly given that we have considered the closest available indicators for our analysis and such socioeconomic indicators are slow to change over time.

[22] The word 'outcome' is used interchangeably throughout the paper to indicate the key variables of interest in the discussion.

Adivasi population, proportion of Dalit population and dependency ratio. These form our primary demographic indicators. For the proportion of pending cases filed by women, we also use gender-specific demographic variables in the specification. For the proportion of pending cases filed by senior citizens, we use the proportion of the population above 60 years of age as an additional social variable. Z_j includes per capita GDP, district-level asset indicator, the proportion of working and urban population. These form our economic indicators of the specification. P_i includes the number of courts per lakh of population and number of judges per court forming our judicial indicators. β_k, Υ_j and δ_i measure the association of these demographic, economic and judicial indicators respectively with each outcome of interest. ε is the regression error term.

B. Logarithmic Transformation, Heteroskedasticity and Outliers

To test for model robustness, we extend our specifications to include logarithmic transformations of the outcome variables. Since the overall results for both specifications are similar, we continue to use initial results without log transforms for interpretation. We also run variations of the models conducting heteroskedasticity corrections and using Cook's distance method, identify existing influential outliers in our models. We drop these influential points in our analysis to estimate alternate models. Models with outliers indicate similar results but are less robust; hence results obtained without outliers are used for future interpretation.

V. Results

We first begin by estimating the association of social, economic and judicial variables on the proportion of all cases pending for over 10 years. This is our main interest variable since an increase in the proportion of cases pending over 10 years is a direct measure of the speed and efficiency of judicial processes. Inordinate delay in case disposal undermines justice. A prolonged trial indicates the weak quality of the judiciary - one that is inefficient due to contradictory, unclear or complicated mechanisms which delay trial and can therefore be misused.[23]

We then present results on the association of the same covariates with i) proportion of pending cases classified as criminal, ii) proportion of pending

---

[23]   W. Kohling 'The Economic Consequences of a Weak Judiciary: Insights from India' (November 2000) Centre for Development Research ZEF University of Bonn 7, 11; Ministry of Law, New Delhi, Government of India, Law Commission of India, 77th Report, *Delays and Arrears in Trial Courts*, (1978) 49.

cases filed by women and iii) proportion of pending cases filed by senior citizens.[24] Additional caution is required when interpreting the results of these three regressions. Whereas a higher proportion of pending cases classified as criminal may indicate a higher proportion of criminal cases filed, it may also imply that criminal cases are disposed of at a slower rate. Similarly, a higher proportion of pending cases filed by women or seniors may indicate either a higher filing rate amongst these groups or a slower rate of such cases getting disposed of.

In interpreting these results, we assume that higher proportions imply higher filing rates. For the proportion of pending cases classified as criminal, we assume that civil and criminal cases get disposed of at the same rate. For the proportion of pending cases filed by women or seniors, our assumption implies that a) there is no discrimination against women or senior citizens by the courts in disposing of their cases and that b) types of cases women or seniors file are not substantially different from cases filed by others.

A higher proportion of pending cases classified as criminal in a district does not necessarily imply that crime rates are higher in that district, even though the two are likely to be correlated. The district may be particularly prone to frivolous or nuisance criminal litigation. Similarly, a higher proportion of cases filed by women may imply either that women in the district have greater agency or that women in such districts face greater harassment or both. This also holds true for the proportion of cases filed by seniors. Keeping these caveats in mind, we interpret higher proportions of the last three outcomes as primarily representing higher filing rates of criminal cases and higher filing rates by women and seniors, respectively.

A. Proportion of Cases Pending Over 10 Years

Our main regression results are presented in **Table 2**, where we estimate the association between socioeconomic factors and the proportion of cases pending over 10 years. We consider pendency of cases for over 10 years as this is a measure of the speed and efficiency of courts. The most striking finding is the strong negative association between judicial pendency and economic indicators, evident from the highly negative significant coefficients associated with GDP per capita, district asset index and proportion of working population. How do we view this association? Districts that perform economically better may have litigants with more awareness and agency since these districts see a fewer proportion of cases beyond 10 years. Public policy may also itself favour such districts through investments in more courts with better infrastructure or the higher incidence of petty

---

24   Significant estimates are reported at 90%, 95% or 99% confidence levels. These are natural strengths of the estimates that arise from our regression analysis. They indicate the confidence in the results estimated by the regression. It is usual practice to report estimates with 95 % and 99 % confidence levels as statistically significant.

bribes in economically better-off districts may ensure that cases do not drag on for long. In developing countries where the State fails to provide public services adequately, corruption has a positive effect on efficiency and assists in economic growth, at least in the short term. This 'speed money' from bribes reduces delay in moving files and ensures preferential treatment to these matters from public officials.[25] Ours is only an attempt to unpack the reasons for the negative relationship between economic development and case pendency at the district level and does not suggest any causal connection, for which further research is necessary.

Access to courts measured by the number of courts per lakh population is another significant factor. Every additional court per lakh of the population is associated with about 0.16 reduction in the proportion of cases pending over 10 years. Our results indicate that district courts in the North-Eastern States perform significantly worse than other States with longer pendency periods.

Table 2: Association Between Social-Economic-Judicial Variables And Proportion Of Cases Pending Over 10 Years

Independent Variables (X_k, Y_j, P_j)	Proportion of Cases Pending over 10 Years	
	Y_{10}	Log $(Y_{10} + 1)$
Sex Ratio	-0.014 (0.046)	-0.017(0.042)
Proportion of Urban Population	0.023(0.022)	0.024(0.020)
Proportion of Adivasi population	0.008(0.016)	0.006(0.015)
Proportion of Dalit population	0.042(0.037)	0.035(0.034)
Proportion of working population	-0.350*** (0.047)	-0.318*** (0.044)
Proportion of population above matriculation	-0.018(0.050)	-0.017(0.047)
Dependency Ratio	-0.031(0.032)	-0.021(0.030)
GDP per capita (x ₹ 10000)	-0.166*** (0.045)	-0.152*** (0.041)
Asset Indicator	-0.241** (0.115)	-0.225** (0.104)
Judges per court	0.001(0.001)	0.001(0.001)
Courts per lakh	-0.016** (0.006)	-0.014** (0.006)
Dummy NE states	-0.031*** (0.009)	-0.029*** (0.008)
Constant	0.268*** (0.064)	0.245*** (0.060)
Observations	480	480

---

[25]   P. Bardhan, 'Corruption and Development: A Review of Issues' (1997) 35(3) Journal of Economic Literature 1323.

Independent Variables (X_k, Y_f, P_f)	Proportion of Cases Pending over 10 Years	
	Y_{10}	Log $(Y_{10} + 1)$
R^2	0.376	0.381
F Statistic (df = 12; 467)	23.475***	23.972***

*, **, *** indicates statistical significance at 90%, 95% and 99%.

B. PROPORTION OF PENDING CASES CLASSIFIED AS CRIMINAL

From **Table 3**, we note that socioeconomic factors show significant association with the proportion of pending cases that are classified as criminal. Considering demographic factors first, the sex ratio has a positive relationship with the proportion of pending cases classified as criminal. There is a significant positive association of the outcome with proportion of Adivasis and significant negative association with the proportion of Dalit population. Since we assume that higher pendency proportions imply higher filing rates, our findings imply that greater proportion of males and Adivasi population is associated with higher filing rates of criminal cases whereas greater proportion of Dalits is associated with lower filing rates of criminal cases. We note a positive relationship between the outcome and the total dependency ratio in a district implying that the filing rate of criminal cases is greater in districts where the working-age population is supporting a larger number of dependents.

We find a negative association between the proportion of population with education levels above matriculation and the outcome. A negative association between the proportion of the working population and the outcome is also observed. Thus, higher levels of general education and employment imply lower filing rates of criminal cases. While per capita GDP of a district has no significant association with proportion of pending cases which are criminal, the other economic indicator i.e. the household level asset indicator for a district is positively associated with the outcome. This implies that the filing rate of criminal cases is greater in districts with more household wealth.

Finally, we find that districts with a greater number of courts per lakh and judges per court are associated with a greater proportion of pending cases classified as criminal. This finding may appear counterintuitive, but we stress here that our results do not imply a causal relationship. It is not the case that having greater access to courts and judges leads to greater filing rates of criminal cases. Rather, this finding suggests that districts that historically have higher filing rates of criminal cases have seen greater investment in judicial infrastructure.

   While higher proportions of pending cases classified as criminal do not necessarily imply higher crime rates and there are several possible explanations for differences in violence levels, some of our findings are consistent with the economic theory of crime.[26] Higher crime rates are observed when economic and demographic conditions are conducive to an environment where criminal activities are more attractive to a large portion of the population, and sociological theories of deprivation also link higher economic inequality with higher crimes.[27]

Table 3: Association between Social-Economic-Judicial Variables and Proportion of Pending Cases which are Criminal

Independent Variables (X_k, Y_j, P_i)	Proportion of Pending Cases which are Criminal	
	Y_c	$\log (Y_c + 1)$
Sex Ratio	0.241** (0.097)	0.122** (0.062)
Proportion of Urban Population	-0.011(0.047)	-0.023(0.030)
Proportion of Adivasi population	0.198*** (0.037)	0.128*** (0.023)
Proportion of Dalit population	-0.209** (0.081)	-0.114** (0.051)
Proportion of working population	-0.581*** (0.102)	-0.404*** (0.063)
Proportion of population above matriculation	-0.756*** (0.111)	-0.486*** (0.070)
Dependency Ratio	0.206*** (0.070)	0.114*** (0.043)
GDP per capita (x ₹10000)	-0.029(0.091)	0.002(0.059)
Asset Indicator	0.668*** (0.234)	0.433*** (0.154)
Judges per court	0.004*** (0.001)	0.003*** (0.001)
Courts per lakh	0.029** (0.014)	0.025*** (0.009)
Dummy NE states	0.002(0.020)	-0.001(0.013)
Constant	0.652*** (0.139)	0.547*** (0.087)
Observations	477	477
R²	0.521	0.515
F Statistic (df = 12; 464)	42.077***	41.008***

*, **, *** indicates statistical significance at 90%, 95% and 99%.

---

[26]   R. Soares & J. Naritomi, 'Understanding High Crime Rates in Latin America: The Role of Social and Policy Factors' in Rafael Di Tella, Sebastian Edwards and Ernesto Schargrodsky (eds), *The Economics of Crime: Lessons for and from Latin America* (University of Chicago Press 2010) 19-55.

[27]   Ibid., 41.

C. Proportion of Pending Cases Filed by Women

Table 4 presents regression analysis results where the outcome of interest is the proportion of pending cases filed by women. There is a statistically significant positive relationship between the proportion of working women and the interest variable. Women with education levels above matriculation have a positive effect on the outcome, though with lower statistical significance. These findings suggest two things, keeping our assumption that higher pendency proportions imply higher filing rates. One, educated and employed women, by virtue of more relative independence, are more incentivised to file cases. Or second, litigation procedures prove to be difficult for uneducated women, dis-incentivising them to adopt the process.

Sex ratio does not seem to have any relationship with the outcome. Increase in the number of males over females in a district does not seem to change the proportion of pending cases filed by women. Similarly, our primary economic indicator, per capita GDP, does not show any relationship. No significant relationship exists between the change in urban population and the outcome. Asset indicator is the only economic variable that has a significant relationship with the proportion of pending cases filed by women. This suggests that districts with wealthier households see a fewer proportion of women filing cases. Finally, the proportion of the Adivasi population has a significant negative relationship with the outcome.

We also find a negative association between the number of courts per lakh and the outcome. While the NJDG data does not account for cases filed before special courts and fast track courts for women, our result suggests the benefit of greater access to such courts, particularly for female litigants. Our results, therefore, support initiatives like establishing special courts for trying cases of crimes against women and fast track courts for expeditious disposal of rape and sexual offences matters against women.[28]

---

[28]   As of 2014, 398 special courts and December 2018, 699 fast track courts were set up <https://doj.gov.in/other-programmes/fast-track-courts> accessed 28 January 2021; <https://data.gov.in/resources/special-courts-set-updesignated-cases-crimes-against-women-and-cases-crimes-against> accessed 28 January 2021.

Additional 1,023 fast track special courts are approved to be set up by the Ministry of Women and Child Development, Government of India <https://pib.gov.in/PressReleasePage.aspx?PRID=1595253> accessed 28 January 2021.

Table 4: Association between Social-Economic-Judicial Variables and Proportion of Pending Cases Filed by Women

Independent Variables (X_k, Y_j, P_j)	Proportion of Pending Cases Filed by Women	
	Y_w	$\log (Y_w + 1)$
Sex Ratio	-0.006(0.039)	-0.005(0.035)
Proportion of Urban population	0.007(0.018)	0.007(0.016)
Proportion of Adivasi population	-0.071*** (0.013)	-0.064*** (0.012)
Proportion of Dalit population	0.007(0.029)	0.007(0.026)
Proportion of working women	0.076*** (0.022)	0.068*** (0.019)
Proportion of women above matriculation	0.073* (0.043)	0.065* (0.039)
Dependency Ratio	-0.004(0.024)	-0.005(0.022)
GDP per capita (x ₹ 10000)	0.029(0.037)	0.026(0.033)
Asset indicator	-0.296*** (0.100)	-0.268*** (0.090)
Judges per court	0.0003(0.001)	0.0003(0.001)
Courts per lakh	-0.021*** (0.005)	-0.019*** (0.005)
Dummy NE states	0.014* (0.008)	0.012* (0.007)
Constant	0.110** (0.047)	0.104** (0.042)
Observations	471	471
R^2	0.15	0.151
F Statistic (df = 12; 458)	6.724***	6.763***

*, **, *** indicates statistical significance at 90%, 95% and 99%.

D. Proportion of Pending Cases Filed by Senior Citizens

Table 5 shows the relationship between socioeconomic indicators with proportion of pending cases filed by senior citizens. Similar to matters filed by women, this forms another primary variable of interest which helps provide a nuanced understanding of the experiences of senior citizens at district courts. Earlier in this section, we set out our main assumptions- that courts do not discriminate against senior citizens and there is no difference in the nature of matters that seniors litigate. However, access to justice issues characteristic of Indian courts such as the lengthy trial process, lack of awareness of available legal protections, mobility constraints and similar difficulties may have a disproportionate

effect on seniors.[29] In our findings, we observe that as the proportion of the population aged 60 years or more increases, the proportion of cases filed by the seniors' increases, an intuitively sensible result. Levels of education, employment and urbanisation have a significant positive relationship with the outcome. Given our assumptions, these findings suggest that filing rates among senior citizens are higher in districts with more urban, more educated and greater levels of regular employment.

As in earlier results for women, districts with wealthier households and higher proportions of Adivasis see fewer proportions of pending cases filed by seniors, implying lower filing rates by seniors.

Table 5: Association between Social-Economic-Judicial Variables and Proportion of Pending Cases Filed by Senior Citizens

Independent Variables (X_k, Y_j, P_i)	Proportion of Pending Cases Filed by Senior Citizens	
	Y_s	$\log (Y_s + 1)$
Sex Ratio	-0.020 (0.027)	-0.018 (0.025)
Proportion of Urban population	0.029** (0.012)	0.029** (0.011)
Proportion of Adivasi population	-0.032*** (0.009)	-0.031*** (0.008)
Proportion of Dalit population	-0.035* (0.019)	-0.031* (0.018)
Proportion of working population	0.188*** (0.025)	0.180*** (0.024)
Proportion of population above matriculation	0.086*** (0.030)	0.094*** (0.028)
Proportion of population above the age of 60	0.841*** (0.108)	0.748*** (0.102)
Dependency Ratio	-0.002 (0.017)	-0.003 (0.016)
GDP per capita (x ₹ 10000)	-0.008 (0.022)	-0.015 (0.022)
Asset Indicator	-0.197*** (0.060)	-0.196*** (0.059)
Judges per court	0.00001 (0.0003)	-0.00002 (0.0004)
Courts per lakh	-0.005 (0.004)	-0.005 (0.004)
Dummy NE states	-0.005 (0.005)	-0.005 (0.005)

---

[29]   New Delhi: Agewell Research and Advocacy Centre, Access to Justice in India for Old People with special focus on Right to Work (March 2020) <https://social.un.org/ageing-working-group/documents/eleventh/Inputs%20NGOs/Access-to-justice-in-old-age-special-focus-on-right-to-work-online.pdf> accessed 3 February 2021.

Independent Variables (X_k, Y_f, P_t)	Proportion of Pending Cases Filed by Senior Citizens	
	Y_s	log (Y_s + 1)
Constant	-0.080** (0.039)	-0.072** (0.036)
Observations	469	469
R²	0.539	0.536
F Statistic (df = 13; 455)	40.850***	40.406***

*, **, *** indicates statistical significance at 90%, 95% and 99%.

VI. Discussion And Summary

Globally, the relationship between judicial pendency and socioeconomic factors is extremely understudied. In India, while some authors have worked on this question, the majority have utilized qualitative methods and in-depth case studies. To approach this question at scale using statistical methods, we constructed a novel dataset combining district level socioeconomic data from government sources with web-scraped data on case pendency from the NJDG. To our knowledge, this is the first rigorous quantitative assessment of Indian judicial data using regression analysis at the district level. Much of the variation in our outcomes of interest centered on pendency is explained by variations in the socioeconomic factors considered. In fact, for two of the four outcomes we studied, the model goodness of fit (or R square) values are greater than 50%. Thus, we find substantial signals in socioeconomic indicators that can be utilised to quantitatively assess variation in judicial data.

The main results from our analysis revolve around the proportion of cases pending for over 10 years. It implies that economic measures like an increase in per capita GDP or increased ownership of household assets are negatively associated with the proportion of cases remaining unresolved for more than 10 years. This result, based on statistical methods for the Indian context, is first of its kind. Our results follow some international studies described earlier, as cited by Loon & Langerwerf[30] and Clemenz & Gugler,[31] finding that long run and sustained economic development, manifested in more businesses and increased governmental activity, prompt courts to take on additional resources to cope with rising demand for their services and result in an increase in civil litigation activity.

---

[30]   F.V. Loon & E. Langerwerf, 'Socioeconomic Development and the Evolution of Litigation Rates of Civil Courts in Belgium, 1835–1980: Longitudinal Studies of Trial Courts' (1990) 24(2) Law & Society Review 284.

[31]   G. Clemenz, and K. Gugler, 'Macroeconomic Development and Civil Litigation' (2000) 9(3) European Journal of Law and Economics 215.

Our empirical evidence also supports the traditional association between pendency numbers and provision of more courts[32], by estimating that case pendency over 10 years reduces with increase in the number of courts per lakh of population in a district. We do not see a statistically significant relationship between the number of judges per court and pendency of unresolved cases for over 10 years, after controlling for courts per capita and other socioeconomic factors. While this result goes against the usual discourse on measures to reduce case pendency,[33] it supports early research by Moog questioning the claim that the solution to the crisis of delays in India's lower courts is adding more judges.[34] Ginsburg & Hoetker hold that procedural reforms like increasing judge strength have a negative effect on the congestion rate when the emphasis is on resolving long-pending cases.[35] Our results, therefore, indicate that increasing access to courts may be a useful policy measure to target case pendency.

Intriguingly, we find that districts with wealthier households are associated with lower proportions of pending cases filed by women and senior citizens. Increase in the proportion of working women in a district is positively associated with proportions of pending cases filed by women. Better employed women are empowered and willing to advocate their rights strongly, including by approaching courts. Taken together, these two findings are particularly interesting in the context of recent research indicating that stability in household income leads Indian women to drop out of the workforce.[36] The hypothesis being that women in districts with wealthier households tend to stop working and increase their dependency on the household. Lower agency, driven by lower financial independence, could lead to overall low filing rates by women. Alternatively, wealthy households

---

[32] As early as in 1958, the 14th Law Commission Report observed that in most Indian States, pendency of old suits was very high. It emphasised the necessity of setting up additional courts at all levels (Munsif, Subordinate and District Courts) to exclusively deal with the disposal of pending matters; Ministry of Law, Government of India, New Delhi, Law Commission of India, 14th Report *'Reform of Judicial Administration'* (1958) vol 1, 148. In its 245th report, the Law Commission was guided by the Supreme Court's directions in *Imtiyaz Ahmad v State of U.P.* (2012) 2 SCC 688 : AIR 2012 SC 642 to undertake an inquiry and submit recommendations for 'immediate measures to be taken by way of creation of additional Courts…to help in elimination of delays, speedy clearance of arrears and reduction of costs' as an important aspect of securing access to justice; Ministry of Law, New Delhi, Government of India, Law Commission of India, 245th Report, *Arrears and Backlog: Creating Additional Judicial (Wo)manpower,* (2014) 1.

[33] In *All India Judges' Assn.(3) v Union of India* (2002) 4 SCC 247, the Supreme Court passed specific directions to clear up case backlog in India - increase in judge strength, filling up judicial vacancies within a year, and providing necessary infrastructure to courts; See also, *P. Ramachandra Rao v State of Karnataka* (2002) 4 SCC 578 ¶22 'The root cause for delay in dispensation of justice in our country is poor judge population ratio'; The 2019 Economic Survey suggested increasing the number of judges to stop accretion of pendency and to clear case backlog.

[34] R. Moog, 'Indian Litigiousness and the Litigation Explosion: Challenging the Legend' (1993) 33(12) Asian Survey 1150.

[35] T. Ginsburg, & G. Hoetker 'The Unreluctant Litigant? An Empirical Analysis of Japan's Turn to Litigation' (2006) 31(32) Journal of Legal Studies 49-50.

[36] L.A. Andres et al, World Bank Group, *Precarious Drop: Reassessing Patterns of Female Labor Force Participation in India (English)* (Policy Research Working Paper No WPS 8024, 2017) 31-32.

have more resources, can invest in litigation, obtain good quality legal representation and enjoy influential social networks- all of which could have a direct impact on reducing case pendency. Employment emerges as another key factor when analysing judicial pendency. Districts with a higher proportion of the working population are associated with a smaller proportion of cases pending over 10 years and a smaller proportion of pending cases classified as criminal. On the other hand, such districts are associated with a higher proportion of pending cases filed by senior citizens. Further, as discussed above, districts with a higher proportion of working women have a higher proportion of cases filed by women, ceteris paribus. Similar, albeit less strong results are associated with greater education levels: we observe an overall negative association between improved levels of education and proportion of cases pending for over 10 years. We also observe a weak but positive association between better-educated women and the proportion of pending cases filed by women.

Our results also shed light on significant district-level differences corresponding to differences in proportions of the population belonging to social groups. First, special attention needs to be paid to India's North-Eastern states where a larger proportion of cases remain pending after 10 years, even after controlling for other socioeconomic factors. Higher proportions of the Adivasi population in a district are associated with lower pendency of cases by women and senior citizens. These findings may indicate that women and senior citizens belonging to Adivasi communities have lower filing rates. Lower filing rates may be either due to lack of access to courts, lack of agency or, (in a positive light) lower levels of harassment and dispute faced by women and seniors in this community. On the other hand, higher proportions of the Adivasi population in a district are associated with higher pendency of criminal cases in that district and vice versa for Dalits. Our analysis throws up these interesting associations, but further research is required to provide in-depth explanations for these findings.

Our work comes with the following caveats. Our analysis is conducted on secondary data, which cannot be independently validated. The different sources of data also come from different time periods. However, all our data is from reputed government sources, and our analysis shows important associations that cannot be easily dismissed. We restrict our work to a single point of time, leading to a cross-sectional dataset rather than a panel. We use a simple regression analysis model on the data, leading to associational (not causal) results. While the majority of studies associate pendency with economic growth, due to restrictions caused by available data, we use GDP per capita as a measure of economic well-being. Finally, our outcomes of interest are measured as proportions of pending cases, a measure available at district level aggregation on the NJDG. The main outcome of interest, the proportion of cases pending over 10 years, is an important measure of judicial efficiency in and of itself. However, filing rates instead of pendency rates would be a cleaner measure in order to study the usage of courts by women

and senior citizens, as well as to study district level incidence of criminal cases. We are also unable to explain certain associations like the negative relationship between the pendency of cases filed by seniors and household wealth.[37] These findings require further investigation and need to be read, taking into account the limitations of the data.

Future opportunities include regular quantitative monitoring of district level data at scale using web-scraping, in-depth sociological and anthropological research to explain the statistical associations we found, applying our analysis to actual filings data and developing more sophisticated statistical models to investigate causal linkages between socioeconomic factors and judicial efficiency. Better measures of data collection and analysis of this data will help target legal services delivery and ensure access to justice for all. Ours is a preliminary attempt at understanding the effect of demographic, social and economic factors on the pendency of cases at the lower courts. We hope our work encourages further research to generate empirical data-lead solutions to improve justice delivery in India.

Data Availability Statement: The data that support the findings of this study are open access and available athttps://www.dropbox.com/sh/cy16c9x3fpsdngx/AABvLM7WE3Pm6SJLfgqphb0qa?dl=0

---

[37] We wanted to examine the relationship of pendency of cases filed by senior citizens and socio-economic data to gain a better understanding of the experience of disadvantaged populations and to check for any implicit bias in decision making against them.