

THE ECONOMIC CONSEQUENCES OF A WEAK JUDICIARY

INSIGHTS FROM INDIA

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The Economic Consequences of a Weak Judiciary:
Insights from India
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ABSTRACT

This paper examines the empirical relationship between the quality of the Indian judiciary and the economic development of the Indian States and Union Territories. It evaluates this causality by analysing the development of the state-level per capita income and poverty rates. I define the quality of the judiciary in terms of: (i) its speed in deciding trials; and, (ii) the predictability of the trial outcome. I measure speed by the backlog in High Courts and predictability through the rate of allowed appeals to the Supreme Court from the High Court. The methodology applied is a cross-regional time-series regression that simultaneously estimates the endogenous relationship between the quality of the judiciary and productive factors, such as agricultural production, private sector development, capital formation, poverty rates, public security and infrastructure. These productive factors in turn influence the level of per capita income, which I model as a function of the size of the agricultural and private services sector, the poverty rate, the transportation infrastructure density, the rental income of land, the fixed capital formation in the industrial sector, the development of the credit markets, the literature rates, and the public safety.

The data indicate that a weak judiciary has a negative effect on economic and social development, which leads to: (i) lower per capita income; (ii) higher poverty rates; (iii) lower private economic activity, (iv) poorer public infrastructure; and, (v) higher crime rates and more industrial riots. The results are robust and the correlations are strong and negative. In addition, through a forecasting simulation I have shown that an increase in predictability and a speedier judiciary substantially increase the per capita income growth rate by 1.9 percentage points.

1 INTRODUCTION

The purpose of this paper is to present a quantitative analysis of the economic consequences of a weak judiciary. The judiciary is a mechanism whereby disputes on the allocation of rights, e.g. property rights, are decided according to norms and rules of the society. The judiciary has two components branches, the organisational implements the laws, and the institutional that defines the procedures within the organisation. The judicial institution itself follows certain rules, which in India are set forth in the Code of Civil Procedure for civil and administrative cases and in the Code of Criminal Procedure for criminal cases. The judiciary itself can be considered an institution in the economic sense.² In the context of economic analysis, the Code of Civil Procedure is by far most important legal institution. It not only determines the mechanisms applied in the judicial system, but also how other institutions are enforced.

Institutions determine the framework of markets and all other mechanisms where goods, services, and information are exchanged. As in the case of all institutions, the mechanisms can either be efficient, thereby stimulating the economy, or less efficient, thus constricting the market. The judiciary as an institution is exposed to two sources of inefficiency: (i) from the rules governing the judiciary; and/or, (ii) from the laws the judiciary is supposed to enforce. In contrast to the traditional law and economics literature, which tends to analyse the latter, I will concentrate on the *inefficient* rules and practices governing the judicial institution and the effects thereof.

This correlation is assumed to be indirect. The judiciary itself has no impact on productive factors, but influences individual decision making, which themselves can influence economic relevant decisions.

In order to estimate the effect of a weak judiciary I have applied an endogenous system of estimations accounting for the indirect impact of institutions. The system consists of an equation determining the impact of the standard economic variables on the per capita income, which themselves are subject to the influence of the judicial and other economic and institutional variables.

The results of the study indicate that, in the Indian context, a weak judiciary can have a significant and negative effect on economic growth, poverty rates and agricultural output. Both, the variable for the average duration of cases in High Courts, representing the speed of the judiciary, and the indicator representing the perceived predictability of the High Courts have a significant and negative impact economic growth, poverty rates and agricultural output.

The remainder of this paper is organised as follows. I develop in section 2 a theory regarding the impact of judicial quality on economic development. Section 3 presents a brief analysis of the characteristics of the Indian judiciary. The methodology of the empirical analysis is discussed in section 4, followed by section 5 that presents and interprets the results. Finally, recommendations for a judicial reform and conclusions are drawn in section 6.

2 THEORY

This section presents a theoretical model, establishing the link between the judiciary as an institution, the microeconomic behaviour of that institution and its macroeconomic impact. Only

² Institutions in the economic sense are rules, norms, laws and procedures, which determine the interactions of society. Individuals forming organisations implement these institutions.

in very few cases the relationship between the microeconomic behaviour of individuals with respect to the institutional environment and the macroeconomic impact has been analysed.³

However to date, neither a formal model, nor empirical studies have revealed the links between the influence of institutions on a microeconomic level and the macroeconomic impact. This is due partly to the general difficulty to aggregate individual microeconomic behaviour, and partly to the loose and indirect effect of institutions.⁴

Instead of assuming a direct effect of the quality of the judiciary on the macroeconomic variables, I assume that the impact is indirect and works through influencing individual decisions that take place on the microeconomic level. Certain microeconomic decisions can then be aggregated to establish a demand function for specific sectors of the economy, which form the mezzo level.

I assume that the impact of the judiciary on these sectors, such as private provision of service and credit markets, can be positive or negative depending on the type of economic activity. These conflicting effects cannot be included in one single macroeconomic model; therefore it is necessary to link the impact of the judiciary to individual decision-making on the mezzo level. Using an endogenous simultaneously estimated multi-layer model can capture the different effects and isolate the impact of institutions on economic development. To create such a model it is essential to have distinct variables representing the quality of the institution in question, such as the predictability and speed of the judiciary in the case at hand.

2.1 THE JUDICIARY AS AN INSTITUTION

Three preconditions have been identified in microeconomic theory that institutions are efficient: (i) the respective institutions are well defined; (ii) all necessary information is verifiable; and (iii) the absence of cost for transferring or securing of property rights. In such an environment bargaining can lead to the Pareto-optimal allocation of goods.⁵ These conditions do not exist in reality.

Inefficiencies usually emerge due to information asymmetries or incomplete information, as not all contingencies can be foreseen, and therefore the respective solutions cannot be included *a priori* in contracts.⁶ Thus, microeconomic analysis so far has focused on the determination of the second-best rules for liability and torts. But these solutions assume that in the final stage of a game, the court and the judge follow some set of predictable rules. The outcome therefore solely depends on the verifiable information and is therefore predictable.

Institutions have long been analysed on a *microeconomic* level.⁷ Only recently has attention been drawn to the *macroeconomic* impact of institutions.⁸ Under the generic term 'good governance', development institutions and development researchers alike have produced a body of research dealing with the general idea that the quality of government matters in terms of a country's level of economic development.⁹ Although these studies contribute to the

³ Levine, Ross, 1998.

⁴ On the aggregation of utility functions see: Hildenbrand, Werner, 1983, 1989. On the indirect links of institutions and macroeconomic indicators see: Allen, Douglas W., 1998, Klein, Peter G. 1998, and North, Douglass C. 1993.

⁵ Coase, Ronald H., 1960.

⁶ The analysis of incomplete contracts deals with the hold up problem created due to diverting ex-ante and ex-post first-best solutions. Thus one of the parties might not wish to continue the contract, even if a surplus would occur. In this case renegotiation might lead to the efficient outcome only if the right liability rule in that specific cases applies. The liability rules are specific performance or remedies, which are determined prior.

⁷ See Coase Ronald H., 1988, Coleman, J., 1982, Schweizer, Urs, 1989, and others.

⁸ The World Bank, 1994.

⁹ Keefer, Philip and Stephen Knack, 1995.

understanding of the impact institutions can have on economic development, they fail to expressly deal with the impact that the quality these institutions may have on per capita income, poverty, agricultural output, and other economic measures.

The corollary of good governance by implication assumes that a country's government can influence the economy negatively through a weak administration. In general it is assumed that inappropriate mechanisms that lack checks and balances create a corrupt environment. In this case third parties, not related with the original economic activity extract a rent by using their discretionary power, and thus harm the economy.¹⁰ The judiciary is the appropriate body to exercise control over such a corrupt administration. Thus, an unbiased judiciary is essential for economic development. This concept of the rule-of-law is part of the analysis of good governance.¹¹

Distortions created due to corruption arise only if individuals do not follow rules. Changing the mechanisms and structures within the administration can prevent corruption. In contrast to corruption, the effects that structural failures of the judiciary have on the economy are not known. I define a weak judiciary, in contrast to a corrupt administration, as an institution that is not efficient. The inefficiency is partly caused by granting the participants too many rights, such as an extensive appeals process, or by unclear rules, causing insecurity.

Although it is assumed that in cases where that judiciary is inefficient or corrupt economic participants tend to prefer alternative dispute resolution mechanisms to the official judiciary; the economic effect of such behaviour is not known.¹² In certain very limited cases where the group of agents is very homogenous and small, as the diamond trade, such behaviour might be more efficient.¹³ In such cases the group can establish its own institutions and simplify the process of dispute resolution.

However, this is clearly not possible in a more complex environment that demands more sophisticated solutions. For example, in the case of the housing rental market in India, because of disproportionately zealous protection of tenants' rights, it is common for the landlord to require the tenant to deposit a security payment amounting to the value of the house or apartment rented.¹⁴ Clearly this is an inefficient mechanism, as this huge collateral could be invested in the economy more productively.¹⁵

Although the previous example has shown an obvious negative effect on the economy and society, neither theory nor empirical studies give a clear answer on the overall effects of a weak judiciary that is necessary to understand situations less intuitively clear as the example presented above. Empirical studies are simply not available, and the conclusions drawn from the theory are ambiguous.¹⁶

¹⁰ Bac, Mehmet, 1996, Bardhan, Pranab, 1997, Davoodi, Hamid, and Vito Tanzi, 1997, Gupta, Sanjeev, Hamid Davoodi, and Rosa Alonso-Terme 1997 and others.

¹¹ Cooter, Robert D., 1996.

¹² Hendley, Kathryn, 1999.

¹³ The diamond industry has very rigid rules. Non-compliance to the practice, such as late payment etc. is punished exclusively with expelling the individual from further participation. This is respected as everyone breaching the order is expelled, too. Other examples are the mafia, and the drug cartels that enforce strict laws. These rules are extremely efficient for the group, but harmful to the surrounding environment.

¹⁴ In India it is essentially impossible to vacate tenants from a house, even if they breach the rental contract continuously. This leads to a shortage in affordable housing facilities to low-medium income families. The lack of sufficient funds for collateral drives them into slums, where rents of 3000 rupees per month are not uncommon.

¹⁵ The collateral lingers in short term bank accounts. Banks in general can lend it, but only for short term conditions.

¹⁶ Hendley, Kathryn, 1999, and Hendley, Kathryn, Peter Murell and Randi Ryterman, 1999a, 1999b, 1999c, 1999d.

It is this lack of clarity that I seek to address in this research. In this paper, using empirical analysis to address a qualitative question I will present some insights regarding the effects that a weak judiciary has on the economic development of India.

The judiciary is an interaction of three different layers: (i) the laws and procedures embodied in the ‘institution judiciary’ that determines the rules and mechanisms; (ii) the government officials, the ‘organization judiciary’ implementing those rules; and, (iii) the litigants and their lawyers, all of whom use the system to solve disputes.¹⁷

At the core of the judiciary is the institution, represented by the laws, rules and procedures that determine the process, actions, and different rights and obligations in a trial.¹⁸ As seen in the research on corruption, regulations can either smoothen a process (as in the case of a trial) or open it up for abuse by the persons involved.¹⁹ Thus the laws and regulations building the institution judiciary are the potential sources of weakness in the judiciary, and are therefore the focus of this analysis.

The persons implementing these laws can be defined as the organisation judiciary. In case of a weak judiciary, characterised by ambiguous or complicated laws, the judges, law enforcement officials, and administration of the courts enable litigants to abuse the law. The litigants finally are the players of the game, using lawyers as their agents, whose actions are determined by the rules of the game.²⁰

The efficiency of the judiciary is crucial, not only for the disputes themselves, but also for all other institutions. As the judiciary enforces and monitors all other institutions, a weak judiciary can affect the performance of all other regulations and rights. Only a minority of institutions is directly economically relevant, in the sense that they immediately influence the markets and change prices. Nevertheless, the aggregated indirect effect of institutions can have a significant effect on economic activities.

Directly economically relevant institutions are for example those that govern taxes, subsidies and duties. Clearly these laws have an immediate effect on prices, interest rates and other economic factors. Beside these institutions, other regulations can have a significant effect on economic development.

For example, one of the most important non-economic factors, in the sense of non-monetary or physical capital, for economic development is the level of human capital. Human capital is the level of knowledge and skill in a society that is accumulated through education. The level of education determines the productivity of the single worker, and the technology level of the production function that determines the overall productivity.²¹ Laws governing the provision of education are the most prominent non-economic institutions. The quality of education institutions is measured in applied development economics often through enrolment and literacy rates. The positive correlation between education and per capita income growth nowadays is well known.²²

¹⁷ I will refer to the institution of the judiciary, the rules and laws determining the procedures of a trial as the institution judiciary.

¹⁸ Institutions are rules, laws, or norms, implemented by organisations composed individuals. Basic law for the implementation of other laws is the Code of Civil Procedure and the Code of Criminal Procedure.

¹⁹ Tanzi, Vito, 1998.

²⁰ For a definition of players, agents and principals see Binmore, Ken, 1992.

²¹ In general only the channels of formal education are considered, although informal education can generate higher rates of return at lower levels of education.

²² Harmon, Colm, and Ian Walker, 1996, and Sala-i-Martin, Xavier, 1997.

In contrast it is assumed that the impact of the judiciary on the economic development is indirect, for instance through the level of human capital. Legislation and the judiciary can influence the quality of the education system in drafting and enforcing education laws respectively. Education, at least basic education, is in most countries formally free and mandatory until a certain age. However, this right is often not enforced. Beside legal illiteracy and the lack of knowledge on their rights, a slow, expensive and unjust judiciary can prevent poor and disadvantaged people from enforcing their rights, and effecting through the lack of education the economic development of a country.

The impact of the institution judiciary on economic relevant decisions can be even more significant. Contracting the exchange and use of property rights drives economic activity. Even in socialist countries like China, where all land belongs to the state, usage rights for land are contracted by the state for economic purposes. Most contracts in everyday affairs are not disputed, mainly due to the customary character of the transactions. Nevertheless, all these transactions rely on the assumption that the underlying contract can be enforced. Hence it is essential for an economy that the state provides an efficient and effective judiciary. In case of a missing or non-functioning judiciary even the simplest contracts might not be fulfilled posing additional risk on the economic participants.

The role of the judiciary is to set up a framework in which the bargaining for property rights follows predetermined rules, and provides a clear and quick decision in cases of doubt. The definition and enforcement of property rights is the core of all economic activity. While the impact of the enforcement of a single contract is only marginal or even zero, the anticipated future enforcement of rights is extremely important for current decisions, contracts, and future activities of all participants.²³ The perceived quality of the judiciary defines the beliefs regarding the enforcement probability and the individual perceived risk. The ability to secure efficiently and effectively property rights defines the quality of the institution judiciary.

Under this definition, the predictability of the outcome of a trial and the speed of the judiciary are the most important factors determining the quality of the judiciary.

2.2 THE GENERAL IMPACT OF INSTITUTIONS

Costs associated with the protection and exchange of property rights are defined as transaction costs.²⁴ Although these costs are difficult to determine on a micro level, I assume that the judiciary as an institution has a direct effect on the magnitude of transaction costs. To illustrate this I consider a pure exchange economy with two goods and two players. The desired amount exchanged then depends on the relative productivity of the players, which is represented by their indifference curves.

The following figures describe such an exchange economy, where two players, with identical utility functions, bargain over the exchange of two goods. Each player is endowed with a fixed quantity of goods. Player one's quantities of good one and two have their origin in the lower left corner of the graph, thus the origin of the utility function is also the lower left hand corner. Player two's quantities and utility originate in the upper right hand corner.

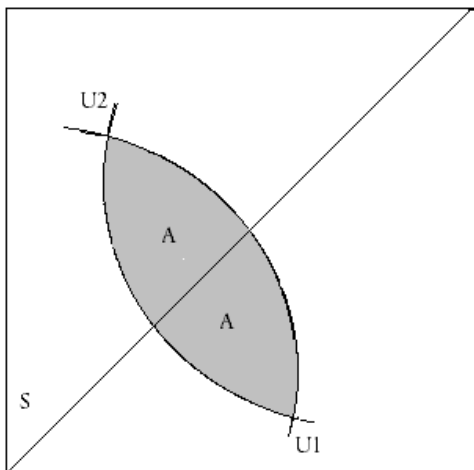
Player one's indifference curve is indicated in figure 2.2-1 through u_1 , and player two's by u_2 . The grey shaded area, A, is the set of all allocation alternatives, which increase the utility

²³ Except for some very high profile cases involving the major participants in an industry, such as the splitting up of AT&T and others, which change a whole industry, the impact is small on the macroeconomic level.

²⁴ Coase, Ronald H., 1960.

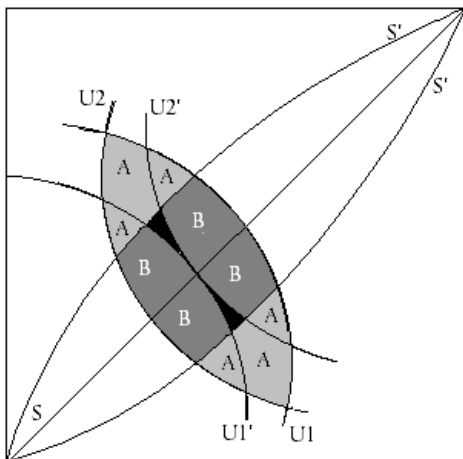
of one or the other player. The area enclosed by both transaction functions is the bargaining set in which both parties are willing to exchange goods. In the absence of transaction costs this area is the total set of goods and thus the limit of the economy. The size of the area determines the total surplus in utility that can be achieved through this exchange. The bargaining power or negotiation skills determine the actual allocation of the surplus.

Figure 2.2-1 Exchange Economy without Transaction Costs



The straight line S in figure 2.2-1 is the set of all Pareto allocations and thus the set of efficient allocations that maximise total utility.²⁵ In the absence of transaction costs the bargaining set is not constrained, and a solution on the set of all Pareto allocations, S, is possible.

Figure 2.2-2 Exchange Economy with Transaction Costs



In figure 2.2-2 the set of Pareto allocations found on the border of the transaction curve is no longer a straight line, but a curve. This indicates that the exchange from one good to another now induces costs, and the transformation rate is thus no longer 1:1. In the case of two identical players, as in this model, the transaction costs induced by a weak judiciary apply to both players resulting in two symmetrical sets of Pareto allocations.

²⁵ The contracting line certainly can lie off the diagonal, in case the individuals have different utility functions.

The indifference curves u'_i depict the Nash-equilibrium in the absence of transaction costs, showing the maximal possible shared surplus. Due to the convex set of Pareto allocations in figure 2.2-2 (the dark grey area, B) are no longer feasible. Consequently, only solutions in the outer part (the light grey areas, A), which are inferior to those in the dark area, are possible. The remaining light grey area is the new bargaining area, which is within the scope of both players. The straight line indicates the set of previously feasible Pareto allocations, upon which the Pareto optimum is located. The area created due to the distortion is the deadweight loss of the weak judiciary. As the new set of Pareto allocations limits the set of feasible solutions, these also indicate those solutions minimizing deadweight loss.

With increasing transaction costs due to a weak judiciary, the set of Pareto allocations S' diverge further from the centre S further limiting the exchange possibilities further. In an extreme case, the possible set of reallocation can lie outside the original indifference curve, thus making an exchange unfeasible. The transaction cost would then exceed the expected gains of trading.

Some critics might argue that transaction costs are no deadweight loss, as others benefit from the payment. It might be argued that in the case of the institution judiciary, transaction costs only represent a reallocation of resources, as the associated costs are a transfer from the litigant to the lawyer. This argument does not hold, as the transfer is not efficient. Lawyer's fees do not increase the value of the transaction or the good, but decrease it for the respective original owner.²⁶ The lawyer's service has only a value because of the litigation and wouldn't be necessary if the dispute could be settled. Far more important than the actual legal fees are transaction costs, which do not imply any transfer of resources, such as time costs.

2.3 THE IMPACT OF A SINGLE CASE

Clearly the immediate effect of any single case on the economy is negligible. In case of a substantial claim, the payment itself is merely a reallocation of funds, which is economically irrelevant, as money itself is not productive. The impact of a single case, which is significant for a sector of the economy or the economy itself, takes place before and after the trial.

Liability cases in the United States however have shown that the defendants spend significant sums to avoid trials and protect the status quo, thus diverting funds from otherwise productive investments to mere expenses. Defendants, and all other businesses facing similar litigation, set up reserves for possible future claims, again reducing funds for investment. After a trial the impact depends on the outcome. If the respective payment is only a compensation for incurred losses or damages, then the net-effect is neutral. In cases that the compensation includes a punitive component, then the reallocation usually has only a negative effect, as the funds are no longer invested.²⁷ In very isolated cases a trial has far-reaching effects on the economy, such as the tobacco trials in the US. Here, and in similar cases the effect on economic development is significant and can be long-lasting.

As these cases are rare and have not yet appeared in India, I propose to abstract the analysis from the impact of individual cases on economic development.

²⁶ For review of the impact of corruption on the economy see Gupta, Sanjeev, Hamid Davoodi, and Rosa Alonso-Terme, 1998.

²⁷ Considering the transaction costs of investments, it is unlikely, but not impossible, that an investment of a recipient yields a higher rate of return, as all business should have the same marginal rate of return.

2.4 THE POTENTIAL IMPACT OF A WEAK JUDICIARY

I define a weak judiciary as an institution that is inefficient or even ineffective due to contradictory, unclear, or complicated mechanisms. These inefficient laws prolong a trial and can be misused by litigants. This misuse of the laws might result in delays, and the prevention of the execution of summons, orders and judgements. I considerer such laws, rather than the behaviour of the litigants, as a source of the weakness. The behaviour of the litigants is not unlawful, but solely take advantage of the structural deficits in the mechanisms of the judiciary. As stated earlier, the Code of Civil Procedure defines the institution judiciary. In India, the Code of Civil Procedure grants both litigants extensive discretion to influence the trial. Thus delays and any legal or illegal investments influencing the outcome of the trial must be considered as a failure of the judiciary.²⁸

In contrast to single cases, these characteristics of the entire legal system are visible for the whole population, both the parties presently engaged in a lawsuit, and those unaffected. A weak judiciary has consequences for all economic activities, since under a weak judiciary property rights are often inadequately protected and enforced. Additional funds have to be spent to secure those rights. In this situation complicated transactions such as long-term and specific investments as well as contracts with higher risks are not performed, or are subject to a risk premium.

A consequence of a weak judiciary is the emergence of alternative dispute resolution systems. Beside a presumably inefficient or ineffective judiciary, the lack of necessary business specific knowledge is a reason for business people to join organisations reducing risk and providing alternative dispute resolution mechanisms such as credit rating organisations or trade associations. These organisations can reduce the negative effect of a weak judiciary through their own internal mechanisms. But it is doubtful that the net effect of these institutions is positive.

They cause additional expenses and are only available to a very homogenous group of people, excluding non-members from the mechanism; additionally it may be forbidden or too expensive to join multiple groups. Any transaction involving members of other groups are subject to the formal judiciary. Saved transaction costs will certainly outweigh expenses for members of those organisations. However, they do increase the transaction costs of non-members who are excluded from certain economic activities. With increasing complexity of the economy, an increasing number of such organisations will be necessary, thus more and more transactions are not covered by these alternative dispute resolution mechanisms. In either way alternative dispute resolution mechanisms are costly, incomplete and exclusionary.²⁹

Particularly the poor are a group that is often not able to access by these alternate dispute resolution mechanisms, as they lack the necessary funds or information that enables them to participate. Also, it is impossible for the overwhelming majority of people involved in everyday transactions to set up or participate in a system covering all eventualities. Alternative dispute resolution mechanisms share the character of insurances. As participation is voluntary, the parties have to agree upon a mechanism prior to a legal action. In any unforeseen event, the formal judiciary acts as default mechanism.

Finally, dispute resolution mechanisms create costs, which have to be covered by the participants. At the same time, the costs of the formal judiciary still exist and are to be borne whether it is being used as a dispute resolution means or not. Abandoning the formal judiciary is

²⁸ I exclude payments to the judge to alter the outcome of the trial.

²⁹ Club goods are public goods where an exclusion of non-members is possible, thus fees and participation can be subject to the norms of the club.

not an option, although it is the cause of the problem; it would lead to the end of government authority, and anarchy would take over, as not even a virtual law enforcement would be done.³⁰ However, due to the club character of alternative dispute resolution mechanisms competition is limited. Only members of the 'club' can benefit from the informal structure; more over, they can be easily excluded. This for example happens to competitors who do not follow internal illegal agreements such as price fixing. Innovation, competition, and development would be obstructed. Finally, the argument that the costs of the formal judiciary could decrease whilst the efficiency could increase due to a lower demand does not hold, as the structural failure would not be eliminated through the use of alternative dispute resolution mechanisms and the size of the judiciary is rigid and would not shrink.

The insecurity created by a weak judiciary changes economic behaviour in two ways. First, the overall cost structure of the economy increases. Additional expenses for financing alternative mechanisms, or the inclusion of a risk premium increase the retail price of a good. Increased collateral to make up for the risk associated with the poor enforcement of property rights increases the consumer price, both reduce demand. Second, not all risk can be covered by higher premiums. If the risk is considered too high, certain transactions simply do not take place. Typical cases are credit rationing, neglecting contract specific investments, and some rental agreements. The effects on the rental market are especially severe in India. Security deposits easily can exceed the value of the property, thus being unaffordable for low to medium income families. These families, though not poor, often end in inner-city slums.³¹ In any case, a negative impact of a weak judiciary on the economy can be assumed.

3 THE INDIAN JUDICIARY

The structure of the Indian judiciary can be analysed in two ways; both are important for econometric analysis: the administrative structure of the judiciary, to obtain regional data; and the legal structure, to attribute the regional differences to the interpretation of the laws. The combination of both features in India is optimal for an economic analysis of the judiciary.

Applied economic development research relies on cross-regional time-series data to identify reasons for different levels of development. The Indian judiciary is, both in the administrative and the legal sense, decentralized to a certain degree. At the same time is this decentralisation based on common grounds. The underlying laws of legal procedure are the same for all courts. Nevertheless, it is possible to observe undeniable differences of the quality of the judiciary between the States that can be attributed clearly to the institution judiciary.

The source of these differences is the common law system, introduced by the British, and adopted by India after independence.³² The Anglo-Saxon common law system has some characteristics facilitating different legal developments in the same country governed by uniform laws. Compared with the civil law system, the common law system is to a lesser degree codified. This liberty enables the judiciary to interpret the law more flexibly and adjust quickly to new developments.³³ However, this system causes also negative effects that can easily outweigh the positive ones. Courts shaping the law set precedence binding for the lower courts in the respective jurisdiction. Lawyers and judges alike are burdened with extensive research to keep

³⁰ Anarchy does not mean chaos, but that groups take over control in limited areas, and that these groups either coexist or fight each other. Within the groups certain rules exist and are enforced.

³¹ 'Rents' paid to a patron of the area can easily reach 3000 rupees a month.

³² With the independence of the Union of India, all previous Privy Council decisions were assumed to be relevant precedence for all Indian courts.

³³ In the old English common law, all claims were subject to writ petitions; all based on torts, nowadays about only 200 are known. All other claims had to be deduced from the original writs. See: <http://www.trin.cam.ac.uk/chartwww/aschartss/aschartss%7Emenu.html>.

up with the changes. The legislative has recognised the power of the judges shaping the law, thus to limit this power, newly enacted legislation tends to be extremely specific. Instead of simplifying the system, more and more details are added, which again are subject to disputes and interpretation.³⁴ Ultimately, litigants depend heavily on lawyers, as the average citizen is not sufficiently legal literate to pursue his own case. The structure is laid out in the following sections.

3.1 ADMINISTRATIVE STRUCTURE

The Union of India is a federal state consisting today of 25 self-administered states and six centrally administered Union Territories and the National Capital Territory Delhi. Although many legislative issues remain under central legislation, the judicature is predominantly under regional administration.³⁵

The judicature consists of a four-tier court system with the Supreme Court at its top and with limited supervision over the High Courts.³⁶ The judges of all courts are in general independent of the legislative and the administration.³⁷ The basic structure of the lower courts is determined by Union legislation of the central Parliament, whereas administrative measures are subject of the states' laws.

The Supreme Court has appellate jurisdiction for final appeals in civil, criminal and administrative matters, as well as original jurisdiction in constitutional matters.³⁸

At High Court level the administrative and judicial supervision of lower courts is joined. Lower courts of a State are administered by the State's High Court; they act as the supervisory agencies in administrative and disciplinary matters for all lower courts.³⁹ The judicature of a Union Territory is assigned to the High Court of an adjoining State.⁴⁰ At the same time is the High Court the appellate jurisdiction for the lower courts in the respective State or assigned Union Territory.

The High Court establishes the administrative procedures of the courts and, through precedence, outlines standards for the interpretation of the Code of Civil Procedure. The legal authority of the High Court, in conjunction with its disciplinary jurisdiction, can significantly influence not only the quality of the High Court, but also of all lower courts in the State. Through the interpretation of the Code of Civil Procedure the power of the participating players and of the judge are determined. Restrictive High Courts limit the rights of the litigants to shorten the trial and to increase court efficiency. This is subject to the interpretation of the Code of Civil Procedure as most rules are non-mandatory, remaining in the discretion of the court. As a result, by setting certain standards, the High Court can influence the efficiency of all courts within its jurisdiction.

³⁴ In *Sughash Satya vs. Ram Narain* AIR 1994 All 120, a temporary injunction was denied because only the crops can would be damaged and not the trees, thus not an irreparable damage injury would be suffered, as the value of the crops was verifiable. Under this assumption, a temporary injunction is always doubtful.

³⁵ Except for the appointment of the supreme judge of the High Court, the judges of the respective High Court appoint all Judges of the state's courts.

³⁶ The Chief Justice of India, Article 217, Constitution of India, appoints High Court judges after approval.

³⁷ For example, Supreme Court judges can only removed from office with a two-third majority in both houses of the Union. See article 124 Constitution of India. Similar provisions apply for all other judges.

³⁸ See articles 131, 133, and 134 Constitution of India.

³⁹ See articles 225 and 227 Constitution of India.

⁴⁰ See article 230 Constitution of India.

The jurisdiction of the High Courts in general only extends to appellate jurisdiction through prerogative writs considering exclusively matters of law. Additionally, High Courts can grant appeals to the Supreme Court for cases sitting in lower courts and at the High Court.

Although the structure of the lower courts varies somewhat throughout the States and Union Territories, they all follow a similar pattern. Most important is the separation of criminal and civil cases amongst the lower courts. Both judicial branches are made up of three levels, serving different types of cases.⁴¹ Below the High Court are the District Courts with original jurisdiction and appellate jurisdiction for smaller cases, which are submitted by the subordinate courts. The District Courts reside in the district capital.

Courts lower than the District Courts are the Subordinate Courts, which are subdivisions of the District courts serving minor cases covering regional centres within the district. Small cases in rural areas are generally filed in Lok Adalats.⁴²

3.2 CODE OF CIVIL PROCEDURE

The Code of Civil Procedure defines the rules of a trial from the filing of a suit, to the execution of a verdict; it is the institution that defines the mechanisms applied by the respective court.⁴³ The Code of Civil Procedure is common for all courts in India and should be implemented uniformly. Nevertheless, significant differences the way High Courts interpret the Code of Civil Procedure have evolved. Due to the common law system, their decisions concerning disputes about statutes of the Code of Civil Procedure are precedence for the respective subordinate courts, thus being binding. In the course of time different standard interpretations have emerged. The States' courts now follow different opinions, which either assign extensive or limited rights to the litigants, or change the role of the judge in a trial.

These inconsistencies among the High Courts' interpretations of the Code of Civil Procedure only can be corrected through precedence set by the Supreme Court, or by amendment of the Code of Civil Procedure. The High Courts themselves grant the right of appeal to the Supreme Court; obviously, administrative matters are rarely admitted.⁴⁴ Prerogative writs, the other means of appealing to the Supreme Court, are only allowed in constitutional matters and thus do not affect the Code of Civil Procedure. Only a special leave to appeal can unify the Code of Civil Procedure of all States.⁴⁵

The Code of Civil Procedure grants participating lawyers extensive rights to influence the progress of the trial. As it is liberal on the structure of the trial it grants the judge discretion on deadlines and other procedural matters. Instead of improving the situation due to higher flexibility, this often has the opposite effect, as judges are not willing to use remedies, such as fines, which are not laid out in the Code of Civil Procedure expressively.

An overwhelming complaint is the length of trials in India. Not only the time it takes until the first hearing, but also even more the total time of the court case. It is quite common that a case is adjourned as soon as one of the lawyers requests it. These requests are based on Order

⁴¹ The assignment of cases in the lower courts depends on the value of the claim in case of civil cases and the maximum verdict for criminal cases.

⁴² Lok Adalats are a compound of a formal court and an alternative dispute resolution system, as the litigants can only be private entities, do have to live in the same village or town, and are not represented by a lawyer.

⁴³ In the economic sense, institutions are laws, rules, procedure and other binding norms that determine the structure and rules of the environment.

⁴⁴ See article 132 Constitution of India.

⁴⁵ A special leave to appeal is addressed directly to and granted by the Supreme Court. This measure is often used in public interest cases filed by civil interest groups.

XVII 1. [S 156] (1) Code of Civil Procedure. The wording of this order – that a court may grant a adjournment if ‘sufficient cause’ is shown – is open to fraudulent use: even an unprepared lawyer may be a ‘sufficient cause’. Though some High Courts apply more stringent rules, allowing only adjournments where the cause is beyond the control of the respective party,⁴⁶ neither the High Court⁴⁷ nor the Supreme Court⁴⁸ may interfere with the decision of a lower court during the trial. Consequently this measure to level the power between the plaintiff and defendant is not available; only after a trial it is subject to the jurisdiction of a higher court through the normal appeals process.

The transfer of a case, which can be applied without any cause⁴⁹, or due to unspecified court jurisdiction for claims⁵⁰ etc., can cause other delays. In general, the Code of Civil Procedure grants either party too many rights to interfere with the proceedings, thus making them vulnerable to delays, inappropriate interventions, fraudulent cases and misuse of courts.

Certain High Courts have issued internal rules to avoid these shortcomings, the most effective ones being mandatory deadlines, strict chronological orders of cases, and limited possibility to transfer cases.

4 METHODOLOGY

The empirical study covers 25 Indian States and Union Territories from 1971 to 1996. This extensive period and nearly complete coverage of all Indian federal entities allows for a comprehensive cross-regional time-series analysis of the impact of the judiciary on the variables chosen.

Empirical analysis to date has relied on predefined indices that provide a determination of the quality of institutions.⁵¹ In such cases, the indices are taken from third parties that design them often for ranking for public awareness rather than econometric purposes.⁵² Often these indices only partially include economically relevant information and are often subject to political motives.⁵³ As these indices tend to be subjective, they are less reliable for estimations. To avoid these problems I have chosen two quantitative variables that incorporate the qualitative characteristics of the judiciary: (i) speed of the judiciary; and, (ii) predictability.

Regarding the variable representing the speed of a trial I have used the average years of backlog in the High Court for the respective state or union. This number is calculated as the ratio of pending cases at the beginning of the year to the cases decided within that year. This ratio gives the average number of years it would take the High Court to eliminate all pending cases at the present rate, without any new instituted cases. This represents the minimum time a litigant has to expect to wait until the case is scheduled for a hearing.

For the second variable, representing the predictability of the judiciary, I have chosen the ratio of dismissed appeals to the total number of appeals from the respective High Court to the

⁴⁶ Pijush Kanti vs. Kinnori Mullick AIR 1984 Cal 184.

⁴⁷ Bhai Dahi vs. Ghanashyam AIR 1956 Bom 102.

⁴⁸ Thakur Sukhpal Singh vs. Thakur Kalyam Singh 1963 92) SCR 733: AIR 1963 SC 146.

⁴⁹ Code of Civil Procedure Part I § 24 [S25].

⁵⁰ Code of Civil Procedure Part I § 17 [S19].

⁵¹ Barro, Robert J. 1994, 1996, Ferree, Karen, Smita Singh, and Robert H. Bates, 1997, Keefer, Philip, and Stephen Knack, 1995, and Ostrom Elinor, 1999.

⁵² The most famous ones are the Freedom House indices for Political Rights and Civil Liberties © The Freedom House Inc.

⁵³ The Freedom House index on Political Rights includes thirteen aspects of political activities, of which only one is concerned with freedom of economic activities.

Supreme Court.⁵⁴ This variable determines the probability that a High Court decides correctly. The underlying assumption here is that the Supreme Court is not biased and it is not subject to errors, and that the majority of the cases are appealed.

Both variables are objective measures for the quality of the judiciary as they are not subject to a classification system as in the case of predefined indices.

Due to the characteristics of institutions, identifying appropriate variables for, and specifying the methodology of the empirical analysis of institutions is more difficult than in traditional econometric analysis. Core of any empirical analysis is the choice of adequate variables.

As mentioned earlier, it is customary in institutional analysis, to use predefined indices from non-economic surveys for the institutional variables. Section 2 concluded that this appears to be a second-best solution as such indices scarcely represent the variable of interest.⁵⁵ Thus, I have chosen research specific variables representing the quality of the judiciary. The choice of the empirical methodology⁵⁶ has to take into account the characteristics of the variables and those of the institutions. The choice of the variables and the methodology applied are discussed in the following section.

4.1 VARIABLES

Institutions reflect the norms and values of the society in which they are in effect. As the norms and values of societies differ sometimes significantly, a simple cross-country estimation cannot be applied and the environment of the country has to be considered. The quality of the institution itself cannot be measured from the outside, as no common scale can be applied. However it is possible to observe the output of certain institutions and thus identify efficient or inefficient ones for that environment. Two methods to incorporate institutional variables into econometric estimations appear feasible. The most commonly applied method is the use of indices that rank the quality of the respective institutions. These indices, borrowed usually from non-economic publications, are subjective yardsticks of the quality of institutions and as such not recommendable for econometric regressions. On the other hand quantitative variables reflecting the quality of the judiciary tend to be more objective, in any case more unbiased and reliable when used in econometric regressions. Even better are quantitative variables that represent economically relevant factors, such as costs, time, and security about future events. These have an immediate impact on economic decisions.

Another possibility to analyse the effect of institutions are case studies. However, as discussed in section two, in the case of the judiciary these do not allow insights into macroeconomic development, which is the core objective of this paper. Therefore general statistical data reflecting the quality of the judiciary and the economic development is necessary. This study includes a time series and a cross regional factor to estimate the influence of a weak judiciary on the macroeconomic development in India. The cross regional information can be gathered on different levels of the judiciary or government. The degree of decentralisation in India provides a disaggregation of the data down to district levels, although more in theory, since the quality and availability of the data deteriorates with lower levels of decentralisation. To keep

⁵⁴ The Supreme Court is the highest court of appeals and constitutional court of the Union of India, whereas the High Courts are the highest courts of a State or Union Territory.

⁵⁵ See Freedom House, various years, for a detailed description of the indices of Political Rights and Civil Liberties, which are used in Barro, Robert J., 1996, and others.

⁵⁶ See Helliwell, John F., 1992 for the incorporation of institutions into the standard Solow growth model.

the amount of data manageable, and to guarantee an acceptable level of data quality I have restricted the data to State or Union Territory level. Judicial data is accordingly collected at High Court level, and the economic data at State level.

The pool of economically relevant variables is made up of all factors that influence the gains of economic activities. With respect to institutions in general these factors are the transaction costs that influence the costs of protecting and transferring property rights. In the specific case of the judiciary, these relevant factors influence the cost of litigation. The costs of litigation include the direct costs such as lawyers' charges and court fees, and indirect costs that do not involve payments but are implicit costs.⁵⁷ As the objective of the analysis is the institution judiciary, the focus rests only on the impudent costs. The length of a trial and the probability of winning determine these costs. Both factors affect immediately the costs of litigation and implicitly the effectiveness of the protection of property rights. Potential litigants discount the payoff with both factors.⁵⁸

Outside factors predetermine the range of the observation. Although the complete series is available since independence, I have chosen the period 1971 to 1996. In 1971 the Central Statistical Organisation, Department of Statistics, Ministry of Planning of the Government of India changed the standards for the survey and aggregation of economic data. A transformation of the old series into the current ones is not possible due to changing definitions. The latest complete data were published 1996, which determines the end of the observation period.

Standardized economic data is readily available only on State level. Only the State's statistical offices publish disaggregated data at district level and lower. But these publications are inconsistent over time and across States, thus a data collection problem would arise. Moreover, only aggregated State level data is adjusted to a common statistical standard, as the State's statistical offices use a variety of statistical standards, therefore I reckon it necessary to perform the research at State level.

4.1.1 Judicial Variables

The reasons for focusing this research on the performance of the High Courts were discussed in the previous section. Apart from technical reasons it seems sufficient from the institutional viewpoint to look at High Courts only. The performance of the courts in each State is comparable as the High Courts set the procedural standards for all lower courts in their jurisdiction: indirectly through precedence and directly through their superior authority.

Although the High Court is usually only the third stage of a trial, most cases are appealed twice, unless the litigant runs out of funds. Two types of appeal exist; the first appeal is due to a matter of fact, or a factual review of case of the next higher court, the second one due to the matter of law, restricted to questions regarding application and interpretation of law, to the High Court. Every litigant can appeal twice, but it has become custom that both appeals are granted, although the second, contrary to the law, often deals with matters of fact, too.⁵⁹ Even a third appeal, to the full bench of the High Court, is allowed if a single judge heard the appeal to the High Court. Lawyers usually persuade their clients to continue until all appeals are exhausted, as only then a judgement is accepted as final and just. Even then a special leave to appeal to the Supreme Court is often tried.

⁵⁷ Naturally I only consider those costs that are induced by the procedures and not the payments to lawyers and court fees.

⁵⁸ Miceli, Thomas J., 1997.

⁵⁹ See one hundred thirty-sixth Law Commission Report, 1990.

Accordingly I have used two quantitative variables for the quality of the judiciary at High Court level: the average duration in High Court and the predictability of a High Court judgement.

I have defined the predictability of High Court judgements as the reliability of the High Court to issue judgements according to the standards of the Supreme Court. If appeals to the Supreme Court from a High Court are regularly allowed, then the judgements of the respective High Court are disputable and thus not predictable. This increases the insecurity of the outcome of the trial.

To capture this unpredictability of the High Court I have used the ratio of dismissed appeals to the total number of appeals to the Supreme Court from the respective High Court. A higher ratio indicates a better judiciary, as the probability of an incorrect decision is lower.

For the expected length of a trial I have used the estimate average duration of a case in High Court in years. The average duration is derived from the number of cases pending in the High Court at the beginning of each year, divided by the number of cases disposed of within the same year. This represents the time it would take the High Court to eliminate the entire backlog measured in years at the present rate.⁶⁰

Variables representing the direct costs of a trial are omitted. These cost would also occur in case of an efficient judiciary, though to a lower extend. A part of the direct costs of the judiciary is correlated with the length of the trial, thus covered by the used variables. In any case these costs are only loosely related to the institution judiciary. The majority of the time a trial takes is comprised of long delays between irregular court appearances. Most of the trial work takes place without hearings, as the courts are courts of record.⁶¹ Court and lawyer's fees depend on the number of appearances. Consequently, the lawyers' charges and court fees are only a minor side effect of long trials, and could be reduced through a change of the behaviour of the litigants towards their lawyers, persuading them to limit the number of adjournments.

The variable indicating the predictability of High Courts judgements I will refer to as APP, and the average time of the backlog as DURATION.

APP is calculated from the records of Supreme Court judgements of India.⁶² All judgements are sorted out by year and High Court, between 1971 and 1996. The year of the Supreme Court judgement is the year associated with the estimation. At the beginning of the observation period some High Courts, such as the Sikkim High Court, were not regularly subject to appeals. In such cases I have filled the gap with the average ratio of the two flanking years.

The numbers of pending cases in High Courts are reported in the Annual Reports of the Ministry of Law, Justice and Company affairs, the Statistical Abstracts of India, the Annual Report of the Supreme Court. The same sources provide the number of cases disposed of in the respective High Court. Additional information can be found in the Law Commission Reports and the statistical records of the High Courts.

The number of cases is steadily increasing, both in High Courts and in the Supreme Court. I have not distinguished between economically relevant cases and others.⁶³ This is legitimate, as the overall image of the judiciary is not drawn from the results of the economically relevant cases, but rather from all cases reported. This might not hold in the case of specific tribunals but

⁶⁰ The World Bank, 1999, recently confirmed both choices.

⁶¹ The major evidence has to be submitted in writing, hearings are only granted to verify depositions of witnesses and evidence and once to present the case.

⁶² Supreme Court Judgements, Legal 2000 CD-ROM Series, Orbit INFOCOM (P) Ltd., Chennai, India.

⁶³ In general most cases, also criminal cases are economically relevant. Only family law and other fields of law concerning social norms are less likely to be of economic relevance.

as they too are subject to the High Court jurisdiction, the quality of these tribunals is correlated with the quality of the High Court. Additionally, the structure of the Indian judiciary does not lend itself to such a distinction. All cases must go through the bottleneck of the High Courts, as these courts are the appellate courts for all cases. As a result any case, which might be handled quickly in a lower court, ends up getting caught in the High Court system.

4.1.2 Economic Variables

Table 4-1 Abbreviations and Corresponding Variables

Abbreviation	Variable	Abbreviation	Variable
AGR	Size of Agricultural Sector	LITt-10	Overall Literacy Rate, ten year lag
AGRCRED	Agricultural Credits	Log (PCI)	Log of Per Capita Income
AGREXP	Agricultural Expenditures	LVA	Value added of Land
AGRS	Size of Agricultural Sector	MINIRRI	Expenditures on minor Irrigation Projects
APP	Average Dismissed Appeals	PANCHPC	Van Panchayats per Capita
CDRAT	Credit Deposit Ratio	PCI	Per Capita Income
COOP	Number of Cooperatives	PLANCOV	Percentage of Rural Population covered by rural Planning Commissions
CRIMEPC	Crimes per Million Capita	POPENSITY	Population Density
CULTEXP	Cultural and Education Expenditures	POR	Poverty Rate (Headcount Index)
DEPPC	Deposits per Capita	POWERRAT	Surplus in Power Production
DEVEXP	Development Expenditures	PPR	Private / Public Services Ratio
DISPPC	Workdays Lost per Million Capita due to Industrial Disputes	PSR	Size of the Private Services Sector
DURATION	Average Expected Duration of a Trial In High Court	RAILPKM	Railway Tracks km per sqkm
ECONEXP	Economic Development Expenditures	RIVERDEV	River Development Expenditures
FIXEDPC	Fixed Productive Capital per Capita	SOCEXP	Social Services Expenditures
FOODEXP	Food Expenditures	SOILEXP	Soil Conservation Expenditures
HEALTHEXP	Health expenditures	STR	Streets km per sqkm
IRRI	Percentage of Irrigated Agricultural Land	VILLAGEDEV	Village Development Expenditures
LANDLESS	Percentage of Landless rural Population	VSIEXP	Village and Small Industries Development Expenditures
LITRUR	Rural Literacy Rate	WELEXP	Welfare Expenditures

Some socio-economic variables are taken from the Statistical Abstracts of India.⁶⁴ These include: fixed productive capital per capita (FIXEDPC); the credit deposit ratio (CDRAT); the deposits per capita (DEPPC), with (CDRAT*DEPPC) representing the magnitude of the credit rationing; the ratio of the power production to power consumption in the state (POWERRAT), representing the dependence on outside power supply; and the density of the railway network (RAILPKM) and streets (STR) respectively. Other institutional variables are the number of industrial disputes per capita that result in lost working days (DISPPC); crimes per capita (CRIMEPC); the number of Van Pachayats⁶⁵ per capita (PANCHPC); the percentage of the rural population covered by rural planning commissions (PLANCOV); the number of village development commissions per rural capita (VILLAGEDEV); and number of rural cooperative members (COOP).

⁶⁴ Statistical Abstracts, India, New Series, Central Statistical Organisation, Department of Statistics, Ministry of Planning, Government of India, various years and issues.

⁶⁵ Panchayats are elected councils, deciding the provision of local public goods. They have original jurisdiction for small private disputes.

I used data from International Food Policy Research Institute for the rural literacy rates (LITRUR); the poverty rates (POR); the percentage of irrigated agricultural area (IRRI); the percentage of landless rural population (LANDLESS); government expenditures on agricultural research (AGREXP); and government spending on infrastructure within development programs (DEVEXP).⁶⁶

The remaining variables are obtained from the database of the Indian Statistical Institute, New Delhi. These are the value added gained from land (LVA); the size of the private services sector (PSR); the ratio of privately to publicly provided services (PPR); the per capita income in present and constant rupees (PCI); and the population size (POP).⁶⁷

Most data were available through multiple sources, though sometimes incomplete. I have mentioned those sources that I primarily used. Missing data are completed with alternative sources.

4.2 ECONOMETRICS

To evaluate the magnitude and sign of the economic effects of a weak judiciary in India, a system of endogenous econometric regressions is used. Due to the characteristics of the judicial variables a combination of methods proved to be necessary.⁶⁸

Institutions usually develop very slowly over time, except when significant reforms take place and a sudden change in the variables is observable. Due to this fact, the causality between the institutional variable and the dependent variable is only predetermined in theory. Nevertheless, in the case of the judiciary it is quite plausible to assume that an increasing quality of the judiciary leads to higher per capita income.

To confirm the assumed causality I performed a Granger causality test in the opposite direction, which did not indicate causality between higher per capita incomes and better judiciary as it might be assumed. In any case the design of the econometric model includes possible endogenous effects of the increase in per capita income on the judicial performance, to account for possible indirect effects not covered by the Granger causality test. I use a pooled time-series cross-regional estimation, which is then simultaneously solved. I have assumed that the error terms over time and over the regions are independent of each other, thus I have applied a seemingly unrelated regression in the framework of a fixed effects model. To control for the variation of the States' sizes, I have applied a fixed effects model with cross section weighting. A White-Heteroskedasticity Consistent Covariance sets of external effects. The coefficients were calculated by iteration.

The method applied is an autoregressive moving average model (ARMA) accounting for the non-stationarity of the time-series data that simultaneously estimates the cross-regional time-series equations with multiple iterations. The convergence of the coefficients is set at 0.01.

In half of the estimations I have included a time trend variable to account for the time-series character of the observations. The coefficient of the time-trend are normalised once to the beginning of the observation, 1971, and once to the year of independence of the Union of India, 1950. Any starting date is somewhat arbitrary, as there is no beginning of an economy. Even if no data is available, or a new state is created, some kind of economic activity has been in place

⁶⁶ Fan, Shenggen, Peter Hazell, and Sukhdeo Thorat, 1998.

⁶⁷ Indian Statistical Institute, various years, unpublished series.

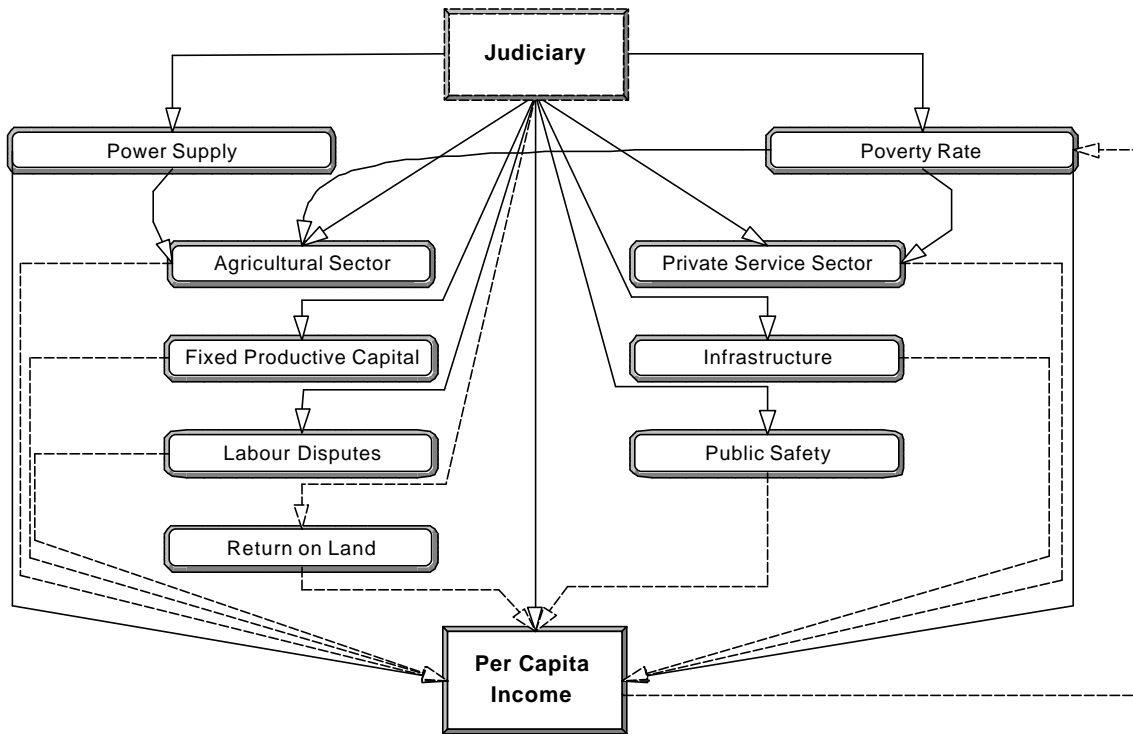
⁶⁸ In contrast to Shenggen, Hazel, and Thorat I use the nominal levels and not the growth rates, as the data set is complete.

before. The time trend represents the time dependent development of the variables. Similar to the constant used in estimations, it accounts for the impact of omitted variables, such as the technology parameter in the production function. In combination with the constant, it determines the constant moves in the course of time, establishing a non-linear correlation between economic output and technology.

4.3 THE ECONOMETRIC MODEL

The formal model applied consists of a set of eight equations. The first determines the level of per capita income in relationship to seven endogenous and various other exogenous independent variables. These are then incorporated as dependent variables in the following endogenous equations. These endogenous variables I assume to be dependent on the level of the judicial quality, and other institutional and economic variables.

Figure 4.3-1 Structure of the Econometric Model



The main equation estimates the overall effect of the institutions and the socio-economic variables on the per capita income. The technique allows for an estimation of the indirect effect institutions and the judiciary have on per capita income through the endogenous variables. Instead of estimating the impact of the judiciary on the residuals of the main equation, I assume that the coefficients function as dependent variables in the following equations. The presented equations are the ones used in the final estimation, as those are the most coherent. To enhance the understanding of the model I would like to offer a graphical solution that shows the basic idea of the assumed correlations.

The main assumption is in line with the Solow growth model, as augmented by Mankiw, Romer, and Weil. Real output is assumed to be determined by a Cobb-Douglas function of physical capital, human capital and efficiency units of the economy.

Equation 4.3-1 Solow Growth Model

$$Y_{t,i} = K_{t,i}^{\alpha} H_{t,i}^{\beta} (A_{t,i} \times X_{t,i})^{1-\alpha-\beta}$$

Where Y is the net state production, K is the level of physical capital, H is the level of human capital, X is a vector of endogenous variables, and A is the quality of the institutions.⁶⁹

The per capita income is supposed to be a function of: the log of the previous period's per capita income; the size of the agricultural sector; the value added of land; the size of the private services sector; the capital endowment of the industry per capita; the strength of the domestic credit market; the rural literacy rate in that period; the degree of sustainability of the domestic power supply; the density of the railway network and paved streets; the poverty rate; the literacy rate of the population; the magnitude of industrial disruptions due to strikes and riots; and finally, the crime rate per capita. The matrix of errors is assumed to be independent over space and time: this holds true for all equations. I have also controlled for the direct effect of the judiciary on the per capita income by including DURATION and APP in the first regression.

Equation 4.3-2 Exogenous Equation on Per Capita Income

$$PCI_{t,i} = c_1 + timetrend@1971 + \beta_1 \log(PCI_{t-1,i}) + \beta_2 AGR_{t,i} + \beta_3 LVA_{t,i} + \beta_4 PSR_{t,i} + \beta_5 FIXEDCPC_{t,i} + \beta_6 (CDRAT_{t,i} * DEPPC_{t,i}) + \beta_7 LITRUR_{t,i} + \beta_8 POWERRAT_{t,i} + \beta_9 RAIPKM_{t,i} + \beta_{10} STR_{t,i} + \beta_{11} POR_{t,i} + \beta_{12} LIT_{t,i} + \beta_{13} DISPPC_{t,i} + \beta_{14} CRIMEPC_{t,i} + \alpha_1 APP + \alpha_2 DURATION \varepsilon_{j,i} \times \bar{X}$$

The independent variables are estimated through indirect effects. The size of the agricultural sector, which can extend to over 50 percent of the net state product, is assumed to be dependent on: the value added of land; the percentage of irrigated agricultural land; the percentage of the landless rural population; the state government's agricultural expenditures; the average duration of the trials in High Court; the ratio of dismissed appeals; the number of Van Panchayats per capita; the crime rate; and the ratio of rural population covered by rural planning commissions.

Equation 4.3-3 Agricultural Production

$$AGR_{t,i} = c_2 + timetrend@1971 + \beta_{15} LVA_{t,i} + \beta_{16} IRRI_{t,i} + \beta_{17} LANDLESS_{t,i} + \beta_{18} AGREXP_{t,i} + \beta_{19} PANCHPC_{t,i} + \beta_{20} CRIMEPC_{t,i} + \beta_{21} PLANCOV_{t,i} + \beta_{22} POR_{t,i} + \beta_{23} POWERRAT_{t,i} + \beta_{24} APP_{t,i} + \beta_{25} DURATION_{t,i} + \varepsilon_{j,i} \times \bar{X}$$

The size of the private services sector is assumed to be dependent only on the ratio of private to public services, the poverty rate, DUARTION, and APP.

Equation 4.3-4 Private Services Sector

$$PSR_{t,i} = c_3 + timetrend@1971 + \beta_{26} PPR_{t,i} + \beta_{27} POR_{t,i} + \beta_{28} APP_{t,i} + \beta_{29} DURATION_{t,i} + \varepsilon_{j,i} \times \bar{X}$$

⁶⁹ Mankiw, G., D. Romer, and D. Weil, 1992.

As the self-sustainability of a State's power supply depends exclusively on the State's capacity to provide sufficient power production capacity, it is possible to estimate the magnitude of this variable solely with institutional variables. In the case of India it is possible to neglect the demand side, as electricity is highly subsidised for all users and free for agricultural production. Thus, it can be assumed that the State government's development expenditure, DURATION, and APP are the only independent variables.

Equation 4.3-5 Power Production

$$POWER_{t,i} = c_4 + \text{timetrend}@1971 + \beta_{30} DEVEXP_{t,i} + \beta_{31} APP_{t,i} + \beta_{32} DURATION_{t,i} + \varepsilon_{j,i} \times \bar{X}$$

One of the major constraints of economic development is poverty itself. Although it may seem contradictory to include the per capita income as a variable independent of the poverty rate, I included it to control for endogenous effects of the poverty rate. Thus, the poverty rate is modelled as a function of: the ratio of landless rural population; the average duration of trials in High Court; the ratio of dismissed appeals; the number of Van Panchayats per capita; the number of village development commissions per capita; the percentage of rural population covered by rural planning commissions; and, the per capita income.

Equation 4.3-6 Poverty Rat

$$POR_{t,i} = c_5 + \text{timetrend}@1971 + \beta_{33} LANDLESS_{t,i} + \beta_{34} PANCHPC_{t,i} + \beta_{35} VILLAGEDEV_{t,i} + \beta_{36} PLANCOV_{t,i} + \beta_{37} PCI_{t,i} + \beta_{38} APP_{t,i} + \beta_{39} DURATION_{t,i} + \varepsilon_{j,i} \times \bar{X}$$

Similar to the rate of power supply, the density of the railway network depends on institutional variables only. In contrast to power supply, railway planning is assigned to the central government. I therefore do not include the State government's development expenditures, DEVEXP. Also I have not included an equation explaining the street density, as the variable STR only comprises paved streets. The density of the street network seems sufficient in India, but as most streets are not suitable for the transportation of goods the mere density is misleading. The situation could be improved simply through an upgrading of the existing streets, which is not subject to legal but financial constraints. These constraints are not measurable in this context, as the development expenditures do not include the pertinent expenditures.

Equation 4.3-7 Railway Infrastructure

$$RAILPKM_{t,i} = c_6 + \text{timetrend}@1971 + \beta_{40} APP_{t,i} + \beta_{41} DURATION_{t,i} + \varepsilon_{j,i} \times \bar{X}$$

Despite the increased involvement that non-capital factors of production play in today's economy, it is still important to measure the level of physical productive capital.

Therefore I consider the ability to provide the necessary physical capital as one of the major constraints of economic growth and development. In this context I have assumed that the accumulation of fixed capital per capita depends on the institutional environment represented through the DURATION and APP as well as the deposits per capita, the credit deposit ratio, and the number of credit cooperatives. The latter three variables are proxies for the level of development of the capital markets. The effect of rural lending cooperatives is not straightforward. I assume a negative effect as the cooperatives are funding small-scale loans, which do not contribute to capital development, but rather serve consumption purposes.

Equation 4.3-8 Fixed Productive Capital

$$FIXEDPC_{t,i} = c_7 + \text{timetrend}@1971 + \beta_{42}DEPPC_{t,i} + \beta_{43}CDRAT_{t,i} + \beta_{44}COOP_{t,i} + \beta_{45}APP_{t,i} + \beta_{46}DURATION_{t,i} + \varepsilon_{j,i} \times \bar{X}$$

The following two equations describe the impact on the institutional variables representing public safety and order. It is assumed that disputes per capita depend on the level of income, the quality of the judiciary, the population density, and the structure of the economy. The latter is represented through the size of the agricultural sector, the ratio of landless poor and the number of Van Panchayats per capita.

Equation 4.3-9 Public Order

$$DISPPC_{t,i} = c_8 + \text{timetrend}@1971 + \beta_{47} \log(PCI_{t,i}) + \beta_{48}POPENSITY_{t,i} + \beta_{49}AGR_{t,i} + \beta_{50}LANDLESSPOOR_{t,i} + \beta_{51}PANCHPC_{t,i} + \beta_{52}APP_{t,i} + \beta_{53}DURATION_{t,i} + \varepsilon_{j,i} \times \bar{X}$$

The level of security expressed by the crimes per capita is dependent on: the quality of the judiciary; the per capita income; the population density; the size of the agricultural sector, indicating the structure of the State; the rate of landless; and the literacy rate.

Equation 4.3-10 Public Safety

$$CRIMEPC_{t,i} = c_9 + \text{timetrend}@1971 + \beta_{54} \log(PCI_{t,i}) + \beta_{55}POPENSITY_{t,i} + \beta_{56}AGR_{t,i} + \beta_{57}LANDLESS_{t,i} + \beta_{58}LIT_{t-10,i} + \beta_{59}APP_{t,i} + \beta_{60}DURATION_{t,i} + \varepsilon_{j,i} \times \bar{X}$$

Finally I have included the influence of the judiciary on the rate of return on land. I assume that the rate of return is only determined by the quality of the judiciary, the remaining influence is covered by the constant and the time trend.

Equation 4.3-11 Rental Income

$$LVA_{t,i} = c_{10} + \text{timetrend}@1971 + \beta_{61}APP_{t,i} + \beta_{62}DURATION + \varepsilon_{j,i} \times \bar{X}$$

The literacy rate used is reported as the ratio of literate population age four and above. In the first sets of equations I used the literacy rate with a ten-year lag to take into account that productive human capital has a lagged impact on the per capita income and other variables.⁷⁰ In contrast I must assume that in rural production children become productive much earlier; thus I did not use lags for the variable rural literacy rate.

In general I have used the log of the per capita income as independent variable when I assume an income effect. Mostly the log of the per capita income is used, as the values of the observations are very volatile, and the extreme values could bias the estimation. But in the case of the poverty rate I prefer the original per capita income. Using the more volatile absolute values I assume that not only the level of income is important but also the relative level of income. In a state with a low average per capita income the price level is supposed to be lower. Therefore I assume that a high per capita income is decreasing the poverty rate.

⁷⁰ In the last estimation the current literacy rate was used.

4.4 HYPOTHESIS

The general hypothesis of this research is that a higher quality of the institution judiciary, meaning a more efficient and more effective judiciary has a positive effect on the per capita income, the poverty rate and the private sector development. The length of the trial and the predictability of the judgement determine the quality of the judiciary. A lower value of DURATION and a higher value of APP indicate a better judiciary. As discussed in the section on the methodology, I mainly expect an indirect effect of the institution judiciary. To illustrate the causality of the effect I present the specific effects separately.

4.4.1 *Direct effects of the endogenous variables*

The predicted effects of the endogenous variables and the direct effects of the independent variables on the per capita income are the following:

According to the convergence theory, I expect that a higher initial level of per capita income should result in a relative lower income in the next period.⁷¹ Thus, the coefficient of log (PCI) should have a negative sign.

I assume that the productivity in agriculture is lower than in other parts of the economy. Thus I expect a negative sign for the coefficient of the size of the agricultural sector, whereas the value added in land should show a positive effect.

I predict the size of the private services sector, the fixed capital per capita, and the efficiency of the capital market to have a positive influence on the per capita income. This holds also for the institutional variables literacy rates, power supply and the density of the transportation networks.

With respect to the institutional variables disputes per capita and crimes per capita I expect a negative effect as they both disrupt social life and increase the insecurity of future developments.

To control the robustness of the model I have estimated a set of regressions, varying the applied model slightly. In order to adjust for endogenous effects of the variables I have included a time trend variable. As it is an endogenous system, I have estimated simultaneously, and allowed for an iteration of the coefficients. The convergence level of the residuals is set at 0.01.

4.4.2 *Indirect effect of the judiciary on the endogenous variables*

I predict that the impact of the judiciary on the size of the agricultural sector, AGR, is negative. A weak judiciary reduces the expected gains from individual work, as the gains can be easily disputed, and ownership of land is often unassigned or disputed. Due to the negative effect of the agriculture itself on the per capita income I assume that the overall effect is positive.

Similar is the hypothesis on the effects of the judiciary on the private services sector, PSR. Here too, I predict a negative effect of a weak judiciary. Private economic activity is more likely to take place if the rules are clearly determined and the expectation on gains is free from institutional insecurity. In combination with the positive effect of the per capita income I assume that the impact on the per capita income is negative.

⁷¹ Swaine, Daniel G., 1998, Ortigueira, Salvador and Manuel S. Santos, 1996.

I have modelled the impact of the power supply ratio, POWERRAT, on the per capita income as a combination of a direct and an indirect effect through the agricultural sector. I assume the impact of a weak judiciary on the power supply and the railway infrastructure, RAILPKM to be negative. In a country like India, where the Government generally follows the same procedures as private entities, the rule of law is largely upheld. Therefore, a slow and unpredictable judiciary slows the development of infrastructure projects. Due to the high subsidisation of electricity, I assume the impact of the power supply on per capita income is to be negative. Therefore, I expect the overall effect of both to be positive.

A major concern of this research is the impact of the judiciary on the poverty rate, POR. The inability of the poor to enforce their rights is one reason for the poor having difficulty in taking part in the economy. Although their legal disputes are less likely to consist of trade disputes, the impact of disputes on land tenure, access to social services and enforcement of civil rights can have a similar depressing effect. Therefore, I assume that a weak judiciary reduces the opportunities of the poor and increases poverty. The ultimate effect is also negative as poverty itself reduces the per capita income.

Investment of the private sector depends on the expected rate of return. A weak judiciary should therefore have a negative effect on the rate of return. In addition, I assume that the supply of capital is lower in case of a weak protection of ownership rights. Thus, I predict that a weak judiciary has a negative effect on capital formation, as well as on the per capita income.

Finally, it is evident that a weak judiciary increases the risk of public disorder and crime. When individuals fear that their rights are not upheld then private action is perceived as a more effective measure. Public disorder and crime increases when individuals take the law into their own hands. An effective and efficient judiciary discourages potential criminals. If the punishment of a crime is quick and certain, then the costs of committing crime increase. Therefore, I predict that a weak judiciary increases public disorder and lowers per capita income significantly.

5 RESULTS

The table below lists the results of the estimated systems. I have varied the original system to test the robustness of the model. As the model is already very complex and comprehensive, only a very limited number of variations are sensible. The model I used faces the risk of all time series estimations. Omitted variables can distort the result and lead to wrong interpretations and the use of time series data poses the problem of autocorrelation and heteroscedasticity. The latter can be avoided by using White Heteroscedasticity Consistent Covariance Matrices, which I did. Adding a time trend into the estimation can take the influence of omitted variables into account. The results are listed in sets, representing the equations presented in the previous sections. The rows represent the coefficients of the respective variables, with their standard error in parenthesis below. The asterisks indicate the level of significance, according to the F-statistic. One and two asterisks represent significance at ten and five percent level respectively.

To simplify the comparison of the findings, I have reported the results of the system in the same order as described in the previous section. Each block represents one equation, starting with the estimation of the endogenous variables on the per capita income, and followed by the endogenous equation.

Before analysing the results of the estimations, I would like to direct your attention to the effects of the model variation. As well as the usual addition of variables, to test for the effect of omitted variables, I have included a time trend variable to control for possible endogenous

effects. This time trend represents autonomous or endogenous developments of the dependent variable over time.

The first noteworthy result is that the coefficients are robust across all applied variations. Only in the case of insignificant coefficients does a change in sign occur, as in the case of rural literacy rates. The significance of the major coefficients of interest, such as the judiciary, is throughout stable, although the standard deviation changes. The remaining unexplained variations of the dependent variables are captured fully by the constants and time trends. Thus both potential problems highlighted earlier – omitted variables and autocorrelation – have negligible impacts. The *a priori* assumptions hold.

As the influence of the judiciary on the per capita income is assumed to be indirect, I applied a simultaneously solved regression system, which yields two types of results.

The first set of results represents the effect of the economically relevant variables on economic development. These coefficients can be interpreted in the usual way: A change in the respective variable has the reported impact, in contrast to the effect of the judiciary on the endogenous variables, which has to be interpreted in conjunction with the effect of the endogenous variable on the per capita income. I included the judicial variables in the first equation as a variation of the final model. These coefficients represent the indirect effects that are not captured through the other equations of the system. They do not indicate that either of the variables has a certain effect, but have to be interpreted in conjunction with the other results, and serve as an error correction term.

Some variables such as the poverty rates have an endogenous character. To approximate the true value I used an iterative approach to estimate the coefficients. After 53 iterations a 0.01 convergence of the coefficients was achieved. I have tested the same estimation without iterations, which results in no significant change.

I would like to discuss the results in two steps. First, I will present the results of the main equation with the per capita income as the dependent variable, and the economic relevant variables as the independent ones. Later I will consecutively analyse the impact of the judiciary on the various economic relevant variables, entering the first regression as independent variables. I will only discuss the results of the final estimation, as it is the most comprehensive and the results do not change dramatically throughout the estimations.

5.1 PER CAPITA INCOME RESULTS; EQUATION 4.2

The coefficient of the agricultural sector variable, AGR, is estimated negative with (-3.981353). This result does not indicate that the agricultural production lowers per capita income (which would imply a loss in the agricultural sector), but merely says that the agricultural sector is less productive than other sectors. States with a high share of agricultural production compared to the overall net state product, NSP, tend to have lower per capita incomes. This is due to several factors. The primary reason is the highly regulated agricultural market. As well as trading barriers for essential commodities, price regulation and other direct regulations constrain the agricultural sector. Of course agricultural production is essential for India; nevertheless the development of other sectors is also essential for sustainable poverty reduction and increase in income. The relative size of the agricultural sector can be changed in two ways, either through a lower agricultural production, or through a higher production in the remaining sectors. An improvement of the situation can be achieved also if the agricultural output grows slower than the

other sectors. The hypothesis is that a strong judiciary can help to increase agricultural productivity and thus increase the per capita income.

The ratio of value added through land tenure, LVA, represents the income of non-agricultural land. I assume that a weak judiciary induces excessive rents to compensate for the risk landlords face when renting property. A negative sign of the variable and its magnitude (-15.51958) suggest that high rents are unproductive and thus have a negative effect on the per capita income. This is not surprising. It can be explained by the stringent rental laws in India, which make it nearly impossible to unilaterally end a lease from the landlords' side. Additionally, filing fraudulent claims on land to maintain the status quo (i.e.: squatters' settlements) is reported. The reason for the negative effect is twofold. High rents can affect the consumption and production side of the economy. Tenants have to change their consumption pattern in order to finance the rent, which has an immediate effect on demand and production. On the other hand landlords tend not to invest the income in productive domestic projects. Both reactions are harmful for the economy.

Private sector activities have, as I predicted, a positive effect on the economic development in India. The size of the private services sector has a significant positive effect (2.132801). This gives hope that future privatisation can kick-off a growth period. This result supports the assumption that private entities are more efficient in providing services than the state, as long as the markets are in place and the institutions support free competition.

Although physical capital is supposed to be less important in modern economies, I assumed that it is still significant for the economic development in India. The reason is obvious. Every kind of economic activity requires a minimum level of physical infrastructure, which is more important for production activities than for services. As India is not yet fully industrialised, the rate of return of physical capital is still very high. In fact it is so high that it is worthwhile for the steel industry to import used production plants. This is reflected in the coefficient for fixed capital (0.091846). The same result holds for the maturity of the capital markets. Beside equity investments short- and long-term capital is shown by the coefficient to be essential for production (0.01035).

The literacy rate has an ambiguous effect on the economic development. When I included a ten-year lag for the overall literacy rate, the impact of the rural literacy rates is estimated to be positive (1.257105), whereas the overall literacy rate is estimated to be negative (-1.767054). On the other hand these numbers change when including the present literacy rates. Then both rates have a significant positive impact (0.068682) for rural literacy and (0.066161) for overall literacy. To understand this discrepancy the development of the literacy rates has to be considered. India has made huge progress in increasing the literacy rates among children and adults. Literacy rates increase much faster than the population growth rate, which proves that adults are becoming more and more literate. This becomes even more obvious when studying the disaggregated literacy rates. Due to this characteristic of the literacy rate the inclusion of the present literacy rate instead of the widely used ten-year lag literacy rate appears more appropriate.

Public infrastructure measures, such as power supply (-0.58177), railway density (-1.07497), and street density (-0.002667) tend to show negative effects. These numbers have to be considered with some distance. Due to the simultaneous estimation, it is possible that the overall effects can be positive through the endogenous impact of the judiciary on the public infrastructure. If the judiciary itself has a negative effect on infrastructure development, then the overall effect of the infrastructure can turn into a positive one.

Public safety and order seem to be important for sound economic development. The coefficient for public order, industrial disputes per capita are significant and positive (7.326417). As in the case of infrastructure, the overall effect can change when adjusting for the effect of the judiciary. Thus it is misleading to quote these numbers independently from the judicial variables. Crimes per capita are reported to have a negative and significant effect (-0.051693).

Table 5-1 Impact of the endogenous variables on the per capita income ⁷²

Exogenous Equation 4-2	Coefficient Value	Coefficient Value	Coefficient Value	Coefficient Value	Coefficient Value	Coefficient Value
C ₁	900.36** (39.92)	852.22** (41.63)	909.57** (21.25)	979.68** (21.84)	979.68** (21.84)	968.69** (21.30)
TREND @ 1971				-3.92* (-4.67)	-3.92* (-4.67)	-4.30** (-3.23)
Log (PCI _{t-1})	142.33** (35.83)					
AGR	-4.81** (0.53)	-4.21** (0.57)	-4.62** (-7.96)	-4.32** (-7.07)	-4.32** (-7.07)	-3.98** (-6.31)
LVA	-16.66** (1.23)	-18.96** (1.22)	-18.84** (-15.33)	-16.85** (-13.71)	-16.85** (-13.71)	-15.52** (-12.26)
PSR	1.75** (0.14)	2.03** (0.14)	1.72** (9.71)	2.057** (10.64)	2.057** (10.64)	2.13** (10.09)
FIXEDPC	0.07** (0.0046)	0.08** (0.01)	0.081** (16.24)	0.100** (17.92)	0.100** (17.92)	0.09** (17.55)
CDRAT*DEPPC	0.01** (0.0006)	0.01** (0.0006)	0.01** (17.97)	0.01** (16.92)	0.01** (16.92)	0.01** (16.14)
LITRUR	-0.38 (1.04)	0.09 (1.09)	-0.52 (-0.43)	1.26 (0.98)	1.26 (0.98)	0.07** (0.07)
POWERRAT	-0.47** (0.11)	-0.39** (0.11)	-0.38** (-3.30)	-0.58** (-5.07)	-0.58** (-5.07)	-0.58** (-5.07)
RAILPKM	-0.03 (0.41)	0.10 (0.43)	0.26 (0.61)	-0.49 (-1.08)	-0.49 (-1.08)	-1.07** (-2.68)
STR	0.000001 (0.002)	0.002 (0.002)	0.001 (0.45)	-0.002 (-0.71)	-0.002 (-0.71)	-0.003** (-1.21)
POR	-0.20* (0.40)	-0.34* (0.43)	-0.14* (-0.30)	-1.90* (-3.71)	-1.90* (-3.71)	-2.33** (-4.56)
LIT _{t-10}	-0.61 (1.43)	-1.33 (1.48)	-0.90 (-0.55)	-1.77* (-1.06)	-1.77* (-1.06)	0.07** (0.06)
DISPPC	6.88** (1.91)	6.91** (1.99)	7.765** (3.68)	7.16** (3.37)	7.16** (3.37)	7.33** (3.44)
CRIMEPC	-0.05** (0.01)	-0.04** (0.01)	-0.05** (-5.90)	-0.06** (-6.32)	-0.06** (-6.32)	-0.05** (-5.98)
APP			3.12* (0.66)	-0.09* (-0.38)	-0.09* (-0.38)	-0.07* (-0.30)
DURATION			-55.74* (-2.31)	5.78** (1.25)	5.78** (1.25)	4.95** (0.92)

⁷² Equation 3 : with time trend, but without constant in equation 4-3 to 4-10. Eq. 4 with time trend and fixed effects in equations 4-3 to 4-10. Eq. 5 with time trend and fixed effects in equation 4-3 to 4-11. Eq. 6 like the previous estimation, but with present overall literature rate used instead of a ten-year lag.

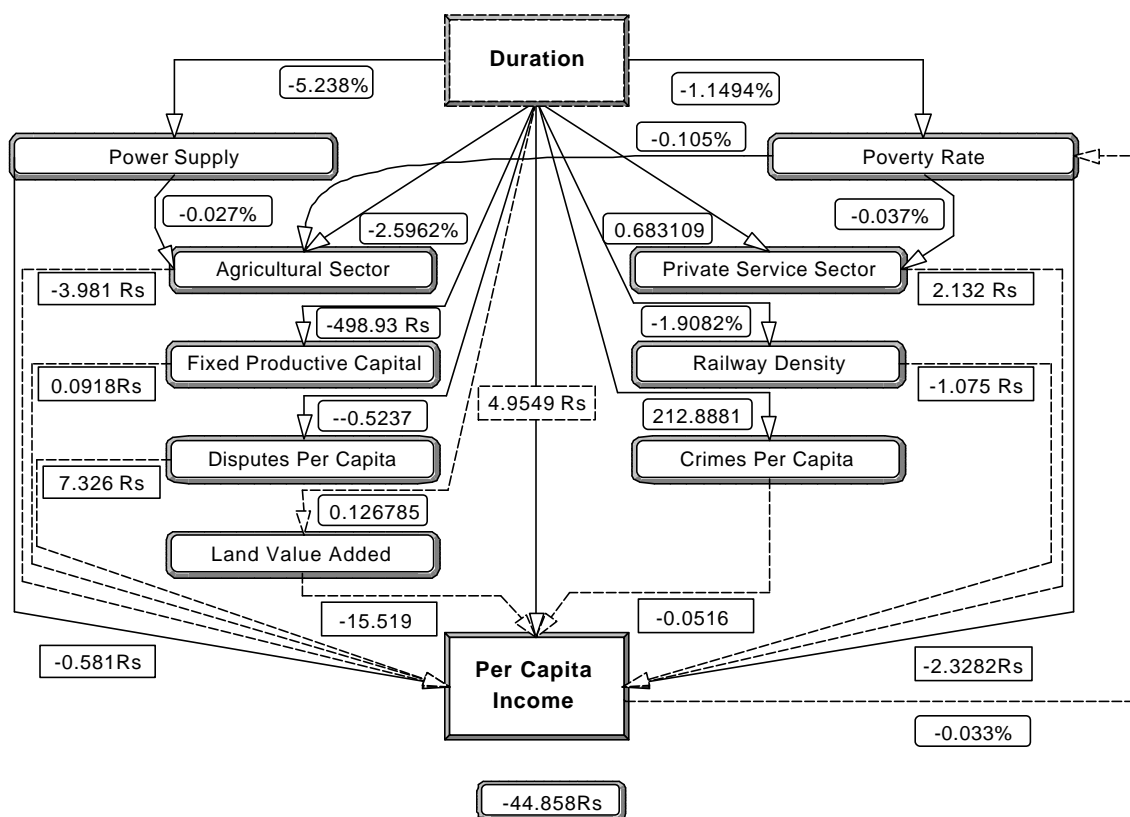
When including the judicial variables in the last estimation, both coefficients represent the magnitude of the impact of the judiciary that are not captured through the indirect effects. These numbers are therefore only corrective figures, catching the remaining effects not included in one of the endogenous equations. The coefficient for the predictability of the judiciary is -0.070658 and for the backlog 4.954988.⁷³ Due to the simultaneous estimation method these results have to be considered in conjunction with the indirect effects. Therefore the other coefficients estimated by the endogenous equations must be included. Please see Annex I for those results.

5.1.1 Summary and Outlook

To obtain a complete picture of the impact the judiciary can have on the economy, a comprehensive review of the single results is helpful. As the impact of institutions and especially the judiciary is indirect and takes place through various channels, all of them have to be considered together. The following graphs visualize the results presented above, and join the single effects into a combined effect.

I would like to present the results as two flow charts to indicate, in the first the effect of the judiciary on the respective variable as the inflow and, in the second, the effect of the respective variable on the per capita income as the outflow.

Graph 5.1.1-1 Duration



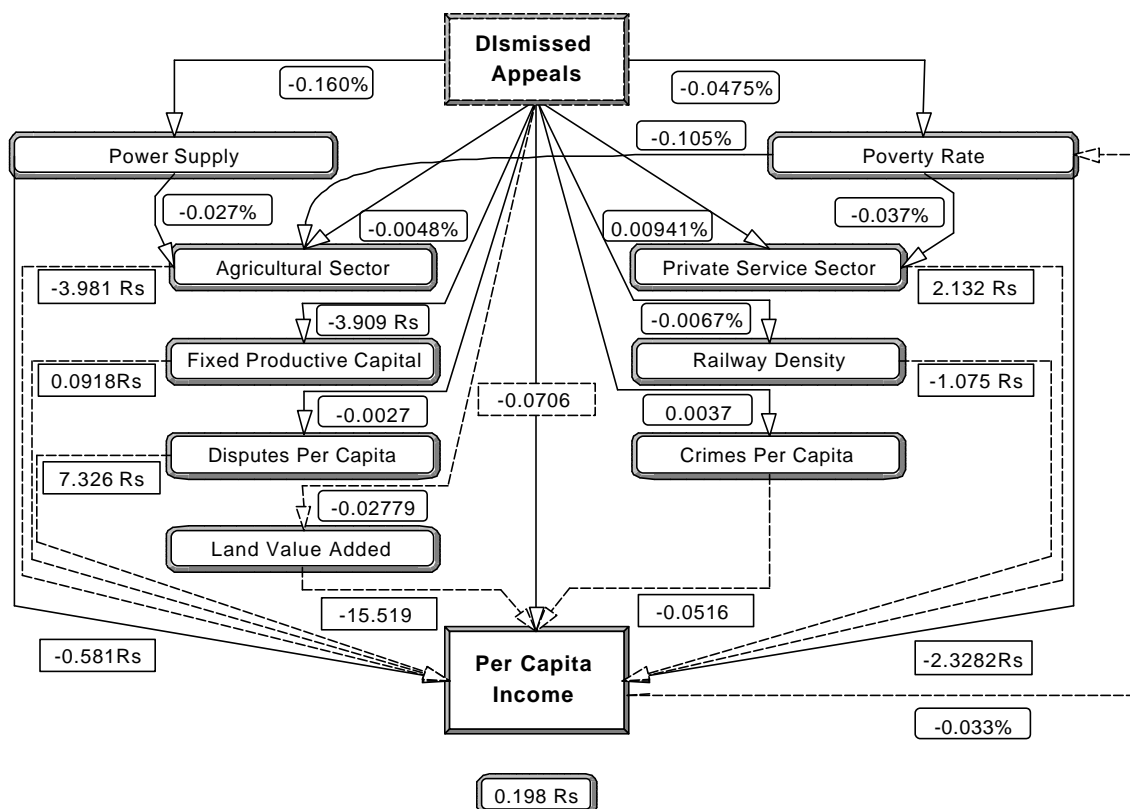
The numbers in the rounded squares show the effect of the judicial variables on the indirect variables. These inflow coefficients then have to be adjusted by the respective outflow

⁷³ As mentioned before, a higher duration in High Court and a lower ratio of dismissed appeals indicate a weak judiciary.

coefficients in order to indicate the indirect effects on the per capita income. These are reported in the rectangular boxes. The outflow box of the per capita income indicates the magnitude of the endogenous effect of the per capita income on the poverty rate. The overall effect is summarised in the box below the per capita income. The first inflow graph indicates the influence of the backlogs in the High Courts, and the second graph describes the influence of the insecurity of appeals from the High Court to the Supreme Court.

In a comparative static forecasting I have estimated the negative effect of the average duration on the economic per capita income at 44.858 in constant 1971 rupees per year duration in High Court. At the same time, one percent insecurity on the outcome of an appeal from the High Court to the Supreme Court produces a loss of 0.198 in constant 1971 rupees. Although the impact of the predictability seems low, this number is put into perspective when assuming that 70 percent predictability is a reasonable assumption. But even then this number is clearly lower than that of the impact of the backlog on the per capita income.

Graph 5.1.1-2 Dismissed Appeals



A ten percent increase in predictability and a reduction of the backlog by one year in 1996 would lead to a significant increase in per capita income. Due to the endogenous effects the effect of a ten percent increase in predictability is lower than 1.98 rupees. Increasing the predictability of the High Courts would lead to an increase in per capita income of 1.2972 rupees, which is still considerable.

6 FORECAST

Due to the endogenous effects and the dynamics of the system, a pure comparative static analysis seems insufficient. Therefore, I applied a dynamic forecasting model to estimate the

effect of potential changes throughout the observation period. The model is based on the previously estimated coefficients and time trend. The forecasting model estimates the values of the endogenous variables according to the exogenous variables and the desired value of the judicial variables. The endogenous variables then simultaneously determine the per capita income in the respective years.

To demonstrate the effect, I estimated the development of the economy over the observation period. Holding the exogenous variables constant, I assumed a quality control system for the judiciary that limits the maximum backlog in High Courts to one year and guarantees a predictability of high courts appeal at a minimum of a 75 percent dismissal rate.

To conduct the forecast, I capped the duration to one year and increased the predictability to 75 percent in case of lower rates. As the quality of the judiciary only gradually deteriorated, and most of the initial values of the judicial variables exceed the criteria, it is reasonable to assume that a reform in 1971 would have had the power to maintain the quality.

The estimation is based on the initial values of the endogenous variables, which are subsequently calculated for the years 1972 to 1996. The exogenous variables are assumed to be the original ones. The model was dynamically estimated with a maximum of 500 iterations and a convergence of the variables of 0.0001.

6.1 DYNAMIC SIMULATION

Due to the endogenous effects and the dynamics of the system, a pure comparative static analysis seems insufficient. Therefore, I applied a dynamic forecasting model to estimate the effect of potential changes throughout the observation period. The model is based on the previously estimated coefficients and time trend. The forecasting model estimates the values of the endogenous variables according to the exogenous variables and the desired value of the judicial variables. The endogenous variables then simultaneously determine the per capita income in the respective years.

To demonstrate the effect, I simulate the development of the economy over the observation period. Holding the exogenous variables constant, I assume a quality control system for the judiciary that limits the maximum backlog in High Courts to one year and guarantees a predictability of high courts appeal at a minimum of a 75 percent dismissal rate.

6.1.1 Model

As the quality of the Indian judiciary deteriorated only gradually, and most of the initial values of the judicial variables exceed the criteria above, it is reasonable to assume that a reform in 1971 would have had the power to maintain the quality.

The estimation is based on the initial values of the endogenous variables, which are subsequently calculated for the years 1972 to 1996. The values of the exogenous variables are assumed to be the original ones. The model is dynamically estimated with a maximum of 500 iterations and a convergence of the variables of 0.01.

The formal economy wide simulation model, presented in Equation 6.7-1, follows the same patterns as the estimation model.

Equation 6.1-1 Macroeconomic Endogenous Simulation

$$E \left[PCI_{t,i} = f \left(\begin{array}{l} E[AGRS_{t,i}]_{JUDICIARY_{t,i}} + E[PSR_{t,i}]_{JUDICIARY_{t,i}} + E[POWERRAT_{t,i}]_{JUDICIARY_{t,i}} + \\ E[POR_{t,i}]_{JUDICIARY_{t,i}} + E[RAILPKM_{t,i}]_{JUDICIARY_{t,i}} + E[FIXEDPC_{t,i}]_{JUDICIARY_{t,i}} + \\ E[DISPPC_{t,i}]_{JUDICIARY_{t,i}} + E[CRIMEPC_{t,i}]_{JUDICIARY_{t,i}} + E[LVA_{t,i}]_{JUDICIARY_{t,i}} + \\ JUDICIARY_{t,i} + \bar{X}_{t,i} \end{array} \right) \right]$$

6.1.2 Overall Forecast All India

The following table shows the estimated changes in the Indian States induced by a judicial reform.

Table 6.1-1 Changes in Per Capita Income and Poverty Rates for the Major States⁷⁴

State	Absolute increase of PCI (constant 1971 Rupees)	Increase of the PCI growth	Decrease of Poverty rate	Absolute reduction of poor in million
AP	372.92	1.59	8.46	5.83
AS	257.63	1.28	24.02	5.59
BI	425.60	2.85	28.66	25.65
GU	420.56	1.21	27.37	11.71
HAR	236.39	0.66	29.78	5.16
JK	566.00	2.45	15.14	1.20
KA	364.73	1.30	21.75	10.13
KE	503.86	1.66	20.17	6.07
MH	711.92	1.46	24.40	19.95
MP	239.19	1.20	17.25	11.84
OR	66.86	0.40	10.17	3.33
PU	460.04	1.06	14.44	3.03
RA	330.95	1.72	15.68	7.16
TN	529.63	1.82	23.28	13.43
UP	64.05	0.43	5.89	8.50
WB	859.01	4.46	6.62	4.67
India Average	389.35	1.63	12.65	143.24

Author's calculations

The discrimination between States and Union Territories is appropriate due to the differences in the economic setting; Union Territories are politically administered by the Union government, and do not rely as heavily on the agricultural sector as States.

⁷⁴ Gain over the course of twenty-five years.

The average values of the key indicators show that West Bengal plays indeed a somewhat exceptional role. But overall, the values make clear that significant changes can be achieved through an improved quality of the judiciary. Some significantly lower changes in growth rates and poverty rates reflect the wide diversity of India. Certainly, the largest States like West Bengal and Rajasthan with the highest number of inhabitants and the largest in size dominate the overall performance of the Union.

An overall increase in average growth rates between 0.66 and 2.15 percentage points sounds large (Table 6.7-2). However, considering that India was lagging behind its South-East Asian neighbours by at least 4 to 6 percentage points, this change still would still leave the gap between India and its neighbours wide open.⁷⁵

The reduction in poverty rate is less striking, as it considers only the poorest part of the population. Even if the reduction had taken place, a considerable amount of poor would be counted in India.

⁷⁵ WDI 2000. The average annual growth rate of per capita income in constant 1995 US\$ during the respective period was 6.4 percent for the major South-East Asian Countries.

Table 6.1-2 Changes in Per Capita Income and Poverty Rates for all States and Union Territories⁷⁶

	Maximum Duration One Year				Maximum Duration 1 ½ Years			
	Change in PCI	Percentage Change	Change in Poverty	Absolute Change	Change in PCI	Percentage Change	Change in Poverty	Absolute Change
AP	735.39	2.18	5.38	3.70	253.79	0.89	0.34	0.25
ARP	138.82	0.27	1.91	0.02	264.92	0.98	1.19	0.02
AS	551.97	1.92	27.02	6.29	243.66	1.05	16.88	4.20
BI	544.30	2.89	37.28	33.36	399.22	2.37	25.83	24.18
DEL	1826.21	1.83	9.41	0.93	320.88	0.29	5.88	0.74
GDD	191.36	0.10	0.15	0.00	65.94	1.52	0.09	0.08
GU	996.33	1.90	17.50	7.49	17.00	0.04	22.41	10.26
HAR	947.11	1.65	19.84	3.44	33.80	0.08	12.59	2.35
HP	643.97	1.71	13.02	0.70	160.82	0.58	8.14	0.07
JK	1160.85	3.43	18.94	1.51	484.54	1.77	7.81	0.70
KA	916.30	2.12	21.04	9.80	251.61	0.76	9.89	4.91
KE	1057.91	2.26	20.38	6.13	331.21	0.91	9.50	2.95
ME	478.66	1.39	10.76	0.20	52.91	0.20	6.72	0.01
MH	2008.86	2.42	6.90	5.64	358.24	0.60	18.59	16.29
MN	379.19	0.85	6.24	0.12	158.58	0.63	3.90	0.02
MP	578.65	1.95	20.55	14.11	188.40	0.82	9.05	6.75
MZ	1459.13	4.13	31.83	0.23	1046.35	7.74	19.89	0.08
NA	501.66	1.20	8.94	0.11	489.33	1.51	5.59	0.07
OR	427.08	1.55	12.42	4.07	19.98	0.10	1.48	0.51
PN	913.41	2.13	10.86	0.09	49.70	0.16	6.79	0.00
PU	1245.67	1.88	12.76	2.68	302.98	0.59	14.43	3.24
RA	537.68	2.09	22.88	10.45	142.90	0.60	10.72	5.36
SI	736.77	1.81	13.56	0.06	19.40	4.33	8.47	0.09
TN	1062.47	2.40	22.83	13.19	367.18	1.05	10.58	6.31
TR	628.94	1.79	13.81	0.40	1042.73	0.93	8.63	0.68
UP	299.26	1.33	11.76	16.98	11.21	0.06	0.23	0.36
WB	636.93	3.40	10.66	7.52	7.13	0.02	0.77	0.58
Average	780.61	2.15	17.02	149.21	221.54	0.66	9.71	91.08

Author's calculations

6.1.3 Agricultural Sector Forecast

Special attention deserves the simulation of the impact of a judicial reform on the agricultural sector. The agricultural sector is not only one of the major sectors of the economy, it is even more important with regards to sustainable poverty reduction. Poverty is to a large extent a rural problem in India.

⁷⁶ Constant 1971 Rupees over the course of twenty-five years.

To render a specific look at the agricultural sector, I conduct the same type of forecast as done for the per capita income development. The values of the variable duration are replaced with the desired value of a maximum length in High Court of one year.

Similar to the results of the per capita income forecast, the in-depth analysis of the agricultural sector comes up with clear results (Table 6.7-3). Increasing the quality of the judiciary facilitates a higher agricultural production and reduces the long-term poverty rates.

The main reasons behind this development are straightforward. The agricultural productivity is presently quite low, as long-term investments are not worthwhile in a legally insecure environment, recalling that roughly thirty percent of the civil claims are related to land ownership, rent, and other land related issues. Especially if agricultural land is prone to development for non-agricultural purposes, unpredictable claims on land are not unusual. This of course increases the risk of long-term investments, and affects sound entrepreneurial behaviour.

India has long tried to implement a land reform, but failed due to a massive filing of suits regarding the reallocation of the land. Therefore, few persons in a district may still control the bulk of agricultural land. Alternatives to agricultural labour are scarce in these areas, making the rural population dependent of the landlords.

Table 6.1-3 Impact of the Judiciary on the Agricultural Sector and Poverty Rates

State	Poverty Rate	Expected Poverty Rate	Decrease in Poverty Rates	Agricultural Share of the Economy	Expected Agricultural Share of the Economy	Increase in Agricultural Share of the Economy
AP	34.23	34.70	-0.46	44.79	47.05	2.26
AS	44.79	45.89	-1.10	46.11	47.26	1.15
BI	45.20	33.15	12.05	46.05	57.79	11.74
GU	58.50	54.73	3.77	44.03	50.47	6.44
HAR	33.05	26.98	6.07	33.12	45.40	12.28
HP	19.33	29.27	-9.93	50.06	33.31	-16.75
JK	21.10	65.45	5.65	39.33	26.63	-12.69
KA	30.51	22.09	8.42	41.02	58.24	17.23
KE	37.78	32.29	5.49	42.33	33.52	-8.81
MP	37.22	24.00	13.23	37.35	57.02	19.67
MH	46.62	43.57	3.05	44.99	55.16	10.16
OR	46.62	35.10	11.52	44.99	51.63	6.64
PU	41.01	24.51	16.50	24.95	40.80	15.86
RA	45.95	49.17	-3.22	48.87	35.22	-13.65
TN	25.95	30.46	-4.50	47.41	47.38	-0.03
UP	32.91	27.77	5.14	50.97	59.54	8.57
WB	38.53	27.34	11.19	36.10	58.07	21.97
Weighted Averages			4.48			3.75

Author's calculations

Moreover, protecting rights, particularly the land tenure of the rural population, and by facilitating a business friendly administration could reduce rural poverty permanently.

Creating new jobs and increasing the productivity of the agricultural sector are decisive for the improvement of the situation of the rural poor. Priority measures would be the enforcement of laws in place, and the channelling of government aid is channelled to the right people. A judicial reform could help to ensure the observance of the rules. The next chapter summarises the consequences of and possible solutions for a reform of the weak judiciary in India.

All in all this empirical research indicates that a judiciary of low quality can have a significant negative effect on the economy as a whole and on the agricultural sector in particular. In India the negative effect on the agricultural production has an immediate effect on the entire economy. Per capita income declines drastically and the poverty rate increases.

The empirical observations confirm the theoretical hypotheses. A weak judiciary sets negative incentives for long-term planning, lowers agricultural productivity, reduces investment, diminishes private economic activity, and hampers poverty reduction.

Essential for an agricultural society like India are secure property rights and an efficient legal system. This potential to improve the living conditions of the rural population and increase income options of the rural and urban poor is, to put it positively, a most promising challenge to all concerned.

7 CONCLUSION

The results for Uttar Pradesh, and the other States, illustrate a significant influence of the judiciary on the economic development. It can be assumed that the underlying hypotheses apparently hold. Although the impact is clearly indirect, economic development relies on a functioning and trustworthy judiciary.

The fundamental attribute of a just judiciary the rule of law is followed, meaning that all participants face the same procedures and no one, even the state, is above the law. The example of India shows, that it is not sufficient a country to maintains the rule of law. Far more important is a judiciary that produces swiftly predictable judgements.

Opponents of legal reforms object that a shortening the trial or even limiting the number of appeals would undermine the fairness of a trial. In this context I claim that the negative effects of a prolonged and unpredictable trial is even more undermining the fairness. However, a speedy and qualified jurisdiction does not, per se, impede 'fairness', i.e. justice. Moreover poor and legally illiterate people have fewer chances to enforce a legitimate claim, and fraudulent cases have better chances to stay in court. Both undermine the efficiency and fairness of the judiciary.

In real life there is some trade off between limiting the powers of the litigants in the trial and appeals process and the fairness of a trial, but in the case of India the negative impact of the weak judiciary clearly outweighs the other effects.

As the judiciary itself is an institution, it is only logical to look at the law governing it as a matter of reform. The Code of Civil Procedure is the most important law governing the institution judiciary.

As the duration of the trial is most significant, a limitation of the time allocated to the opposing parties would increase the quality dramatically. Time limits are not undermining the rights of litigants if they are reasonably long.

Additionally it would be helpful to detangle the trials in High Court. Assigning a minimum value for cases to be appealed to High Court can immediately shorten the backlog and increase the predictability.

Finally it is reasonable to assume that changing the payment scheme for lawyers can set the right incentives. Nowadays lawyers are paid by court appearance, changing the scheme to a value based remuneration would induce lawyers to speed up the procedures in court and put the judges under pressure to deal quicker with the cases. All these results support the assumption that a reform of the judiciary, the Code of Civil Procedure and the administration will have a significant positive impact on the economic situation in India.

8 ANNEX I (INDIRECT EFFECTS, EQUATIONS 8.1 TO 8.8)

This section considers only the results of the judicial variables on the economically relevant estimators. All other results are not reported, but can be seen in the respective tables. In most cases the effect of the predictability of the judiciary is only weakly significant in magnitude, whereas the speed in High Courts, represented by the backlog of cases, has a significant effect. To remind the reader of the meaning of the judicial variables, I may repeat the definition: The longer the average duration in High Court the weaker the judiciary; thus a negative sign of the coefficient DURATION shows a negative effect. The longer the trial, the lower the value of the dependent variable. The same applies to the ratio of dismissed appeals, though the sign of the coefficient is assumed to be the opposite. The more appeals are dismissed, the quicker is the average trail, and the more predictable the judiciary. Thus a negative sign of the coefficient is a positive effect. The effect of a weak judiciary is always referred to as an increase in the duration or decrease in the ratio of dismissed appeals. In all cases the absolute value of the coefficient of the time factor is much higher than that of the ratio of dismissed appeals. This is due to the different scales. The former measures in years, with a range from about 0.5 to 5, and the latter is a percentage quotation, with a range from 0 to 1; therefore the coefficients are not comparable in their magnitude. Nevertheless, the influence of the ratio of dismissed appeals is much lower than that of the average duration in High Court.

Agricultural Sector

The effects of a weak judiciary on the agricultural sector are ambiguous. The coefficient of the average duration in High Court is negative and significant (-2.5962). Due to the negative effect of the agricultural sector on per capita income, the overall effect of backlogs on per capita income is positive (10.335). At the same time the number of dismissed appeals has a negative and significant effect on the agricultural sector (-0.0048), which leads to an overall positive effect of ratio of dismissed appeals on the per capita income (0.0191).

Table 8-1 Agricultural Sector

Endogenous Equation 4-3 Dependent Variable AGR	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value LIT _t (Std. Errors)
C ₂	56.10** (1.57)	56.10** (1.57)		56.97** (26.48)	56.97** (26.48)	56.97** (26.48)
TREND @ 1971			0.17** (3.61)	-0.32** (-9.08)	-0.32** (-9.08)	-0.32** (-9.08)
LVA	-0.83** (0.05)	-0.83** (0.05)	-0.68** (-10.09)	-0.64** (-14.25)	-0.64** (-14.25)	-0.64** (-14.25)
IRRI	-0.09** (0.01)	-0.09** (0.01)	0.22** (10.18)	0.005* (0.33)	0.005* (0.33)	0.005* (0.33)
LANDLESS	-0.56** (0.05)	-0.56** (0.05)	-0.21** (-2.30)	-0.52** (-9.43)	-0.52** (-9.43)	-0.52** (-9.43)
AGREXP	-0.00003 (0.00003)	-0.00003 (0.00003)	-0.00004 (-1.03)	-0.00001 (-0.30)	-0.00001 (-0.30)	-0.00001 (-0.30)
PANCHPC	0.02**	0.02**	0.013**	0.015**	0.015**	0.015**

Endogenous Equation 4-3 Dependent Variable AGR	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value LIT _t (Std. Errors)
	(0.00)	(0.00)	(6.34)	(10.69)	(10.69)	(10.69)
CRIMEPC	-0.0001 (0.0004)	-0.0001 (0.0004)	0.001* (1.80)	-0.0003* (-0.68)	-0.0003* (-0.68)	-0.0003* (-0.68)
PLANCOV	-0.018* (0.01)	-0.018* (0.01)	0.15** (6.76)	-0.075* (-6.49)	-0.075* (-6.49)	-0.075* (-6.49)
POR			0.55** (20.66)	0.10** (4.95)	0.10** (4.95)	0.10** (4.95)
POWERRAT				0.027* (5.51)	0.027* (5.51)	0.027* (5.51)
APP	6.24** (1.29)	6.24** (1.29)	9.54** (5.67)	-0.005* (-0.45)	-0.005* (-0.45)	-0.005* (-0.45)
DURATION	-2.24** (0.22)	-2.24** (0.22)	-1.92** (-8.36)	-2.60** (-13.58)	-2.60** (-13.58)	-2.60** (-13.58)

Private Services Sector

The overall influence of the judiciary on the per capita income through the private services sector is the same as through the agricultural sector, although the individual effects are reversed. A rising number of appeals has a positive effect on private sector development (0.00941) and shows an increase in the average duration (0.68311). Due to the positive effect of the private sector on the per capita income the overall effect for both variables is positive: (0.020) in the case of appeals and (1.456) for the average duration.

Table 8-2 Private Services Sector

Endogenous Equation 4-4 Dependent Variable PSR	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value LIT _t (Std. Errors)
C ₃	3.83** (0.13)	3.83** (0.13)		-1.25** (-4.73)	-1.25** (-4.73)	-1.25** (-4.73)
TREND @ 1971			0.07** (13.09)	0.09** (12.53)	0.09** (12.53)	0.09** (12.53)
PPR	-0.01** (0.0004)	-0.01** (0.0004)	0.004** (32.03)	0.005** (29.23)	0.005** (29.23)	0.005** (29.23)
POR			-0.65** (-3.62)	0.038** (14.83)	0.038** (14.83)	0.038** (14.83)
APP	0.41* (0.20)	0.41* (0.20)	0.04** (14.32)	0.01** (2.91)	0.01** (2.91)	0.01** (2.91)
DURATION	0.83** (0.04)	0.83** (0.04)	0.63** (8.55)	0.68** (9.59)	0.68** (9.59)	0.68** (9.59)

Power Supply

The effect of the judiciary through the power supply on the per capita income is twofold. On the one hand the power supply affects per capita income directly, on the other the power supply has a decisive influence on the agricultural sector and bears therefore indirectly on the per capita income. This link is especially important as the agricultural sector is highly subsidised and electricity for agricultural users is free of charge. Free electricity is particularly important for the operation of irrigation systems increasing agricultural productivity. The direct effect of power supply on the per capita income is estimated to be negative (-0.581). The effect of the power supply on the agricultural sector is estimated to be negative, too, (-0.027).

Table 8-3 Power Supply

Endogenous Equation 4-5 Dependent Variable POWERRAT	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value LIT _t (Std. Errors)
C ₄	107.15** (6.22)	107.15** (6.22)		148.10** (20.76)	148.10** (20.76)	148.10** (20.76)
TREND @ 1971			0.55* (1.95)	-1.60* (-6.33)	-1.60* (-6.33)	-1.60* (-6.33)
DEVEXP	-0.00003* (0.00002)	-0.00003* (0.00002)	-0.00009** (-2.38)	0.00007** (2.44)	0.00007** (2.44)	0.00007** (2.44)
APP	29.16** (8.05)	29.16** (8.05)	132.59** (27.08)	-0.16* (-1.85)	-0.16* (-1.85)	-0.16* (-1.85)
DURATION	-2.67* (1.65)	-2.67* (1.65)	18.95** (10.71)	-5.24** (-3.46)	-5.24** (-3.46)	-5.24** (-3.46)

The coefficient for the ratio of dismissed appeals on the power supply is negative (-0.160). The overall effect – the combination of both indirect effects (-0.0172) through the agricultural sector (0.09296) – of a predictable judiciary on the per capita income through the agricultural sector is negative. But as the positive direct effect offsets the indirect effect through the agricultural sector the overall effect is positive (0.07576). The duration in High Court has a negative effect on the power supply (-5.238). At the same time the effect of the power supply on the agricultural sector is again negative (-0.027). The indirect effects offset each other with (-0.563) for the indirect effect and (3.043) for the direct effect; thus is the overall effect of the backlog positive (2.480).

Poverty Rate

The effect of the poverty rate on the per capita income is the same as the one of the power supply, although here two indirect effects cumulate: one through the private sector (-0.037) and one through the agricultural sector (-0.105). The coefficient of the dismissed appeals on the poverty rate is negative (-0.0475), which leads to an overall positive effect on the per capita income (0.09448). At the same time the effect of the duration on the poverty rate is negative (-1.1494). This amounts to an overall positive effect (2.2862).

Table 8-4 Poverty Rate

Endogenous Equation 4-6 Dependent Variable POR	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value LIT _t (Std. Errors)
C ₅	32.68** (1.77)	32.68** (1.77)		62.51** (27.80)	62.51** (27.80)	62.51** (27.80)
TREND @ 1971			0.33** (4.59)	-0.36** (-5.06)	-0.36** (-5.06)	-0.36** (-5.06)
LANDLESS	-0.25** (0.06)	-0.25** (0.06)	0.30** (3.45)	0.07* (1.19)	0.07* (1.19)	0.07* (1.19)
PANCHPC	0.02** (0.002)	0.02** (0.002)	0.004** (1.95)	-0.006** (-3.08)	-0.006** (-3.08)	-0.006** (-3.08)
VILLAGEDEV	0.02 (0.03)	0.02 (0.03)	0.06** (1.60)	-0.018* (-0.62)	-0.018* (-0.62)	-0.018* (-0.62)
PLANCOV	0.10** (0.02)	0.10** (0.02)	0.52** (18.50)	-0.024* (-17.01)	-0.024* (-17.01)	-0.024* (-17.01)
PCI			-0.03** (-17.44)	-0.033** (-1.83)	-0.033** (-1.83)	-0.033** (-1.83)
APP	9.19** (2.21)	9.19** (2.21)	15.74** (5.27)	0.048** (2.27)	0.048** (2.27)	0.048** (2.27)
DURATION	-5.08** (0.40)	-5.08** (0.40)	-2.43** (-5.88)	-1.15** (-3.07)	-1.15** (-3.07)	-1.15** (-3.07)

Railway Density

In the case of the railway infrastructure the effects of a weak judiciary on the per capita income are ambiguous. The overall effect of a long trial is positive (2.0513), whereas the effects of a high predictability are positive (0.0072).

Table 8-5 Railway Density

Endogenous Equation 4-7 Dependent Variable RAILPKM	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value LIT _t (Std. Errors)
C ₆	31.21** (0.24)	31.21** (0.24)		31.94** (226.08)	31.94** (226.08)	31.94** (226.08)
TREND @ 1971			0.053** (3.09)	0.03** (5.17)	0.03** (5.17)	0.03** (5.17)
APP	-0.95** (0.30)	-0.95** (0.30)	15.05** (30.39)	-0.01** (-3.03)	-0.01** (-3.03)	-0.01** (-3.03)
DURATION	-0.20** (0.04)	-0.20** (0.04)	5.50** (36.65)	-1.91** (-23.93)	-1.91** (-23.93)	-1.91** (-23.93)

Fixed Capital

At the same time a weak judiciary in terms of backlogs in High Court has a negative effect on the per capita income through the fixed productive capital per capita (-45.80). This effect offsets the positive effect of an unpredictable judiciary. It is possible to assume an overall negative effect of a weak judiciary on the per capita income through the capital endowment.

Table 8-6 Fixed Productive Capital

Endogenous Equation 4-8 Dependent Variable FIXEDPC	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value LIT _t (Std. Errors)
C ₇	833.45** (184.93)	833.45** (184.93)		1426.22** (6.97)	1426.22** (6.97)	1426.22** (6.97)
TREND @ 1971			29.99** (6.54)	25.35** (4.72)	25.35** (4.72)	25.35** (4.72)
DEPPC	4.87** (0.09)	4.87** (0.09)	4.66** (48.66)	4.40** (43.25)	4.40** (43.25)	4.40** (43.25)
CDRAT	-0.29 (1.82)	-0.29 (1.82)	6.58** (4.52)	4.26** (2.30)	4.26** (2.30)	4.26** (2.30)
COOP	-0.003 (0.01)	-0.003 (0.01)	-0.01 (-1.41)	0.02** (1.72)	0.02** (1.72)	0.02** (1.72)
APP	630.05** (153.02)	630.04** (153.02)	988.18** (6.56)	-3.91** (-1.95)	-3.91** (-1.95)	-3.91** (-1.95)
DURATION	-230.61** (30.75)	-230.61** (30.75)	-223.50** (-9.05)	-498.94** (-14.77)	-498.94** (-14.77)	-498.94** (-14.77)

Public Order

The variable disputes per capita measures the disruption of the production in factories due to strikes, riots and other labour disputes. These fights often arise due to the weak position of labourers, which are often hired on a daily basis and scarcely enjoy protective labour laws. Instead of filing a suit, a walkout is more easily and efficiently organised. Thus I assume that a weak judiciary increases the probability of industrial disputes, and thus contributes to a lower per capita income.

Table 8-7 Industrial Disputes

Endogenous Equation 4-9 Dependent Variable DISPPC	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)
C ₈	-8.71** (2.00)	-8.71234**7 (2.00)		-8.911222** (-4.40)	-8.911222** (-4.40)	-8.911222** (-4.40)
TREND @ 1971			-0.02 (-1.46)	-0.03** (-1.91)	-0.03** (-1.91)	-0.03** (-1.91)
Log (PCI)	1.66**	1.66**	0.55**	1.83**	1.83**	1.83**

Endogenous Equation 4-9 Dependent Variable DISPPC	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)
	(0.28)	(0.28)	(6.40)	(6.20)	(6.20)	(6.20)
POPDENSITY	0.001** (0.0004)	0.001** (0.0004)	0.001** (2.81)	0.001** (3.69)	0.001** (3.69)	0.001** (3.69)
AGR	-0.027** (0.008)	-0.027** (0.008)	-0.05** (-6.36)	-0.03** (-3.04)	-0.03** (-3.04)	-0.03** (-3.04)
LANDLESS/POR	1.29* (0.55)	1.29* (0.55)	1.92** (3.55)	1.31** (2.34)	1.31** (2.34)	1.31** (2.34)
PANCHPC	0.001** (0.0002)	0.001** (0.0002)	0.001** (4.07)	0.001** (2.52)	0.001** (2.52)	0.001** (2.52)
APP	0.65* (0.33)	0.65* (0.33)	0.33 (1.02)	-0.003* (-0.76)	-0.003* (-0.76)	-0.003* (-0.76)
DURATION	-0.52** (0.07)	-0.52** (0.07)	-0.57** (-7.92)	-0.52** (-7.86)	-0.52** (-7.86)	-0.52** (-7.86)

The coefficient of the duration is negative (-0.5237), thus the overall impact is negative, too (3.8366). At the same time, the impact of a predictable judiciary is negative (-0.02779); thus the overall effect is again negative (-0.01978).

Crimes

The other aspect of public life that I assume has a significant economic impact and is evidently influenced by the quality of the judiciary is the crime rate. A quick and predictable judiciary is supposed to contribute to a lower crime rate. This certainly holds true in the case of the backlog in High Court.

The duration of the criminal procedure has a significant positive effect on the crime rate (212.8881), while crimes reduce the per capita income (-0.0516). The overall effect is (-10.985). In the case of the predictability the result is the opposite, although the coefficient is very small (0.0037). The overall effect is estimated to be negative (-0.00019).

Table 8-8 Crimes per Capita

Endogenous Equation 4-10 (CRIMEPC)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)
C ₉	5062.49** (337.29)	5062.49** (337.29)		4976.67** (14.74)	4976.67** (14.74)	5289.04** (15.71)
TREND @ 1971			-5.10** (-2.44)	-6.93** (-2.85)	-6.93** (-2.85)	-7.81** (-2.34)
Log (PCI)	-472.97** (47.81)	-472.97** (47.81)	233.08** (13.78)	-417.41* (-8.68)	-417.41* (-8.68)	-466.06** (-9.77)
POPDENSITY	-0.78** (0.11)	-0.78** (0.11)	-0.25** (-2.45)	-0.57** (-5.44)	-0.57** (-5.44)	-0.64** (-6.90)
AGR	-22.67**	-22.67**	-15.73**	-25.00**	-25.00**	-24.69**

Endogenous Equation 4-10 (CRIMEPC)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)
	(1.61)	(1.61)	(-10.78)	(-15.17)	(-15.17)	(-15.26)
LANDLESS/POR	33.89**	33.89**	31.44**	30.04**	30.04**	29.86*
	(3.53)	(3.53)	(8.92)	(8.16)	(8.16)	(8.72)
LIT _{t-10}	-1.94	-1.94	-8.77**	-1.18*	-1.18*	0.97**
	(2.92)	(2.92)	(-3.49)	(-0.41)	(-0.41)	(0.39)
APP	307.12**	307.12**	203.71**	0.21*	0.21*	-0.04*
	(84.37)	(84.37)	(2.28)	(0.20)	(0.20)	(-0.03)
DURATION	231.89**	231.89**	339.59**	225.63**	225.63**	212.89**
	(19.03)	(19.03)	(22.61)	(12.05)	(12.05)	(10.36)

Rental Income

As discussed in the previous section I hypothesize that a weak judiciary has a positive effect on the rental income. Landowners have to increase the rent significantly to cover the risk due to the insecurity created by a weak judiciary. This leads to marginal returns much higher than in all other industries, accordingly, the per capita income is decreasing. The results confirm this hypothesis: The impact of the backlog on the rental income is positive (0.1268) and of the predictability is negative (-0.02779). This leads to an overall negative effect of the weak judiciary on the per capita income in the case of backlogs (-1.9676) and (0.431) in the case of predictability.

Table 8-9 Rate of Return – Rental Income

Endogenous Equation 4-11 Dependent Variable	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)	Coefficient Value (Std. Errors)
C ₁₀					6.01**	6.01**
					(9.66)	(9.66)
Trend @ 1971					0.17*	0.17*
					(9.43)	(9.43)
APP					-0.03**	-0.03**
					(-3.45)	(-3.45)
DURATION					0.13**	0.13**
					(1.34)	(1.34)

REFERENCES

- Alesina, Alberto, Sule Özler, Nouriel Roubini, and Phillip Swagel, *Political Instability and Economic Growth*, Journal of Economic Growth 1, 1996
- Allen, Douglas W., *Transaction Costs*, in: Encyclopaedia of Law and Economics, Bouckaert, B, and G. De Geest (eds.)
- Bac, Mehmet, *Corruption and Supervision Costs in Hierarchies*, Journal of Comparative Economics, Vol. 22, April 1996
- Banerjee, Abhijit V., *A Theory of Misgovernance*, Quarterly Journal of Economics, 1997
- Bardhan, Parnab, *The Nature of Institutional Impediments of Economic Development*,
- Bardhan, Pranab, *Corruption and Development: A Review of Issues*, Journal of Economic Literature, vol. 35, 1997
- Barro, Robert J., *Democracy and Growth*, NBER Working Paper No. 4909, 1994
- Barro, Robert J., *Determinants of Democracy*, Development Discussion Paper No. 570, Harvard Institute for International Development, 1997
- Barro, Robert J., *Determinants of Economic Growth a Cross Country Empirical Study*, Development Discussion Paper No. 579, Harvard Institute for International Development, 1997
- Barro, Robert J., *Economic Growth in a Cross Section of Countries*, The Quarterly Journal of Economics, 1991
- Barro, Robert J., *Institutions and Growth, an Introductory Essay*, Journal of Economic Growth 1, 1996
- Binmore, Ken, *Fun and Games*, D.C. Heath and Company, Lexington, 1992
- Blanchard, Olivier, and Michael Kremer, *Disorganization*, Quarterly Journal of Economics, vol. 72, no. 4, 1997
- Coase, Ronald H., *The Problem of Social Cost*, Law and Economics, vol.3, 1960
- Davoodi, Hamid, and Vito Tanzi, *Corruption, Public Investment, and Growth*, IMF Working Paper WP/97/139, 1997
- Debroy, Bibek, *Some Issues in Law Reform in India*, Conference on Governance in China, India, and Russia, Bonn, May 3-4, 1999
- Fan, Shenggen, Peter Hazell, and Sukhadeo Thorat, *Government Spending, Growth and Poverty: An Analysis of Interlinkages in Rural India*, EPTD Discussion Paper No. 33, International Food Policy Research Institute, Washington D.C., 1998
- Ferree, Karen, Smita Singh, and Robert H. Bates, *Political Institutions and Economic Growth in Africa*, Development Discussion Paper No. 583, 1997, Harvard Institute for International Development
- Greif, Avner, *Contracting, Enforcement, and Efficiency: Economics Beyond the Law*, Annual Bank Conference on Development Economics, The World Bank, Washington D.C., April 25-26, 1996
- Greif, Avner, *Micro Theory and Recent Development in the Study of Economic Institutions Through Economic History*, Stanford Economics Working Papers #96-001, 1996

- Gupta, Sanjeev, Hamid Davoodi, and Rosa Alonso-Terme, *Does Corruption affect Income Inequality and Poverty*, IMF Working Paper WP/98/76, 1998.
- Harmon, Colm, and Ian Walker, *The Marginal and Average Returns to Schooling*, Center for Economic Research Working Paper wp/96-20, University College Dublin, 1996
- Helliwell, John F., *Empirical linkages between Democracy and Economic Growth*, NBER Working Paper No. 4066, 1992
- Hendley, Kathryn, Peter Murrell, and Randi Ryterman, *A Regional Analysis of Transactional Strategies of Russian Enterprises*, 1999 a
<http://www.bsos.umd.edu/econ/murrell/papers/regionlaw.pdf>
- Hendley, Kathryn, Peter Murrell, and Randi Ryterman, *Do Repeat Players Behave Differently in Russia? An Evaluation of Contractual and Litigation Behavior of Russian Enterprises*, 1999 b,
<http://www.bsos.umd.edu/econ/murrell/papers/glnpaper.pdf>,⁷⁷
- Hendley, Kathryn, Peter Murrell, and Randi Ryterman, *Law Works in Russia: The Role of Legal Institutions in the Transactions of Russian Enterprises*, 1999 c
<http://www.bsos.umd.edu/econ/murrell/papers/lawworks.pdf>
- Hendley, Kathryn, Peter Murrell, and Randi Ryterman, *Law, Relationships, and Private Enforcement: Transactional Strategies of Russian Enterprises*, 1999 d
<http://www.bsos.umd.edu/econ/murrell/papers/transtrs.pdf>
- Hildenbrand, Werner, *The Weak Axiom of Revealed Preference for Market Demand Is Strong*, *Econometrica*, Vol. 57, No. 4, July 1989
- Hildenbrand, Werner, *On the "Law of Demand"*, *Econometrica*, Vol. 51, No. 4, July 1983
- IMF, *Good Governance*, IMF, Washington D.C., 1997
- Imrohorglu, Ayse, Antonio Merlo, and Peter Rupert, *On the Political Economy of Income Redistribution and Crime*, Federal Reserve Bank of Cleveland, Working Paper No. 9606, 1996
- Islam, Narzul, *Growth Empirics: A Panel Data Approach*, *The Quarterly Journal of Economics*, November 1995
- Islam, Narzul, *Growth Empirics: A Panel Data Approach- A Reply*, *The Quarterly Journal of Economics*, February 1998
- Knack, Stephen, and Philip Keefer, *Does Social Capital Have An Economic Payoff? A Cross-Country Investigation*, *Quarterly Journal of Economics*, 1997
- Knack, Stephen, and Philip Keefer, *Institutions and Economic Performance: Cross-Country Tests Using Alternative Institutional Measures*, *Economics and Politics* vol.7, no.3, 1995
- Levine, Ross, *Law, Finance, and Economic Growth*, University of Virginia 1997
- Levine, Ross, *The Legal Environment, Banks, and Long-Run Economic Growth*, University of Virginia 1998
- Levine, Ross, and Sara Zervos, *Stock Markets, Banks, and Economic Growth*, *The American Economic Review*, vol. 88, no. 3, 1998

⁷⁷ References with an Internet address as a source can be downloaded at: <http://netec.mcc.ac.uk/local/search.html>. Please enter the reference number to download the paper.

- Mankiw, N. Gregory, David Romer, and David N. Weil, *A Contribution to the Empirics of Economic Growth*, *The Quarterly Journal of Economics*, May 1992.
- Miceli, Thomas J., *Economics of the Law*, Oxford University Press, Oxford, 1997
- North, Douglass C., *Institutions, Institutional Change and Economic Performance*, Cambridge University Press, Cambridge 1990
- North, Douglass C., *Institutions, Transaction Costs and Productivity in the Long Run*, wpa:wuwpeh:9309004
- North, Douglass C., *Institutions and Credible Commitment*, wpa:wuwpeh:9412002
- North, Douglass C., *Institutions and Productivity in History*, wpa:wuwpeh:9411003
- North, Douglass C., *Transaction Costs Trough Time*, wpa:wuwpeh:9411006
- Orbit Infocom, *Supreme Court Judgements, Legal 2000 CD-ROM Series*, Chennai, India, 2000
- Ortigueira, Salvador and Manuel S. Santos, *On Convergence in Endogenous Growth Models*, Discussion Paper 110, Federal Reserve Bank of Minneapolis, 1996
- Ostrom, Elinor, *Investing in Capital, Institutions, and Incentives*, in: C. Clague (Ed.): *Institutions and Economic Development: Applications of the New Institutional Economics to Growth and Governance in Less Developed and Post-Communist Countries*, John Hopkins University Press, Baltimore, 1999
- Pinheiro, Armando Castelar, *Judicial System Performance and Economic Development*, IRIS Working Paper 1996 First Draft, Forthcoming
- Polinsky, A. Mitchell and Steven Shavell, *Corruption and Optimal Law Enforcement*, NBER Working Paper 6945, 1999
- Polinsky, A. Mitchell, and Steven Shavell, *Public Enforcement of Law*, in: *Encyclopaedia of Law and Economics*, Bouckaert, B, and G. De Geest (eds.)
- Posner, Richard A., *Creating a Legal Framework for Economic Development*, *The World Bank Research Observer*, vol. 3, no.1, 1998, pp.1-11
- Sala-i-Martin, Xavier X., *I just ran four million Regressions*, NBER Working Paper 6252, 1997
- Swaine, Daniel G., *What do Cross-Sectional Growth Regressions Tell us about Convergence?*, Working Paper No. 98/4, Federal Reserve Bank of Boston, 1998
- Tanzi, Vito, *Corruption around the World: Causes, Consequences, Scope, and Cures*, IMF Working Paper, WP/98/63, 1998
- Tanzi, Vito, *The Demise of the Nation State?*, IMF Working Paper WP/98/120, 1998
- Tanzi, Vito and Hamid Davoodi, *Corruption, Public Investment, and Growth*, IMF Working Paper WP/97/139, 1997
- Tanzi, Vito, and Hamid Davoodi, *Roads to Nowhere: How Corruption in Public Investment Hurts Growth*, *Economic Issues*, IMF, Washington D.C., 1998
- The World Bank, *Governance: the World Bank's experience – Development in Practice*, The World Bank, Washington D.C., 1994
- The World Bank, *Court Performance around the World; A Comparative Perspective*, World Bank Technical Paper No. 430, The World Bank, Washington D.C., 1999

Tirole, Jean, *The internal Organization of Government*, Oxford Economic Papers 46, 1994

Union of India, Ministry of Planning, Government of India, *Statistical Abstracts, India, New Series*, Central Statistical Organisation, Department of Statistics, Ministry of Planning, Government of India, various years