

Comparing Legal and Alternative Institutions in Finance and Commerce^{*}

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Abstract

The extraordinary economic performance of China and India in recent decades raises questions about the conventional wisdom of using the law as the basis of finance and commerce. Despite well-known advantages, the legal system can be captured by interest groups and become a barrier to change. We argue that one way to solve this problem is *not* to use the law as the basis for finance and commerce but instead to use alternative mechanisms *outside* the legal system. Our prior work on China and India suggests that these alternative mechanisms can be quite effective. In the context of a fast-growing economy such as China or India, there is an additional advantage that this type of system can adapt and change much more quickly than when the law is used. In particular, competition can ensure the most efficient mechanism prevails and this process does not require persuading the legislature and the electorate to revise the law when circumstances change.

Keywords: Law, institutions, dispute resolution, legislature, competition.

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I. Introduction

Transiting from a central-planning to a market-based economy, China's economic achievements in the past three decades have been remarkable. Its economic growth, lifting hundreds of millions of people out of poverty in the process, represents one of the greatest economic transformations in history. India is also successful in terms of economic growth during the past two decades. At the end of 2007, China and India together accounted for 40 percent of the world population and about 20 percent of the world GDP in Purchasing Power Parity terms. With growth rates among the highest of all countries, these two countries will play an increasingly important role in the world economy for years to come.

The conventional wisdom is that to be successful in terms of long-run economic growth a country needs good institutions. In particular, it needs a good legal system that enforces contracts and resolves disputes, and a good financial system including financial markets and a banking sector to fund firm growth. In earlier work (Allen, Qian, and Qian (AQQ) 2005, 2008; Allen, Chakrabarti, De, Qian, and Qian (ACDQQ) 2008), we have documented that China and India do not have these. In fact, the governments of these countries are notoriously corrupt, the legal systems are ineffective and the financial markets and banks are small relative to their economies and inefficient.

Most observers would characterize the economic performance in China as “successful *despite* the lack of Western-style institutions.” By contrast, we argue in this paper that China has done well *because of* this lack of Western-style institutions – in that conducting business outside the legal system in fast-growing economies, such as China and India, can actually be superior to using the law as the basis for business transactions. We develop our main theses by comparing and contrasting two different sets of systems, with the focus on dispute resolution and contract enforcement mechanisms. In one system, observed in developed and democratic countries such as the US, there is a commitment to use the law as the basis for finance and commerce, with legal

institutions serving as the ultimate source for resolving disputes and enforcing contracts. Moreover, any fundamental changes to the law must be approved by the legislature and electorate. In the other system, with China providing the primary example, there is no clear definition of private property rights at the highest level and, in place of the law, nonlegal mechanisms based on reputation, relationships and trust rather are the norm for conducting business.¹

We first present a number of examples on how alternative mechanisms work. The practice of corporate sectors in China and India shows alternative mechanisms can substitute for legal mechanisms. Based on earlier work, we show that despite the differences in their history of developing laws and formal institutions, the legal environment for business is characterized by an underdeveloped legal system (China) or a sophisticated legal system on paper but of limited use in practice (India). Among the corporate sectors, state-owned enterprises and publicly listed firms have much easier access to legal institutions and banks and financial markets than non-state, non-listed firms. To a large extent these non-state, non-listed firms, most of which small and medium firms, conduct business outside the legal system and do not rely on financial markets or banks for most of their financing needs. Instead, they use nonlegal methods based on reputation, relationships and trust to settle disputes and enforce contracts and rely on alternative financing channels such as trade credits and funds from family and friends to finance their growth. Yet in both countries and especially in China, it is the non-state, non-listed firms that provide most of the economic growth and employ most of the labor forces. The insignificant role of the law and legal system during periods of rapid economic development has also been documented in other East Asian economies such as Japan and Taiwan.

In another set of examples we show that alternative mechanisms can handle disputes that arise from complicated transactions. The diamond industry has historically operated outside the

¹ These classifications are made to facilitate the comparisons between legal and alternative mechanisms, and not meant to be mutually exclusive when studying a given country. Indeed, in many countries, a combination of the two systems could be working in practice.

legal system of any one country and flourished worldwide despite the lack of transparency of most of its dispute resolutions. Another industry that has relied on out-of-court mediations and arbitrations to settle disputes is reinsurance. In recent years it appears that selecting objective arbitrators has become a lengthy process that significantly delays the arbitration process, particularly in large-scale transactions, and the industry has been revising the traditional procedure in order to expedite the process without losing sight of fairness.

Next, we focus on examples in developed countries, such as the US, to highlight the problems of using the law and legal system as the basis for finance and commerce. The reason for this choice is obvious. If there are significant deficiencies in using the legal system in countries with the most developed institutions, these deficiencies are likely to be magnified in developing countries with poor institutions.

A central concept in the legal paradigm and institutions is (private) property rights. One of the intensely debated topics on property rights is intellectual property rights including patents and copyrights. The practice of enforcing intellectual property rights by courts is much more vigilant and prevalent in developed countries than in developing countries. There is a widespread belief in developed countries that such protection is essential for promoting innovations, but this belief is not shared in the developing world. What is the empirical evidence? An extensive literature in industrial organization in economics has found mixed results on the relationship between patent/copyright protection and the pace of innovations. On the one hand, exclusive property rights provide strong incentives for innovations and do lead to more innovations in some industries such as chemicals and pharmaceuticals. On the other hand, such a positive relationship between protection and pace of innovations is not observed in many other industries; instead, excessive protection deters competition, which is another important factor in spurring innovations. One of the problems with the patent/copyright and litigation systems is that they induce rent-seeking behaviors by vested

interest groups and individuals. With abundant resources they can undertake various measures and use the legal system to block competition and innovations from other individuals or smaller companies, and this type of behavior reduces social welfare.

Another potential problem of using the law lies in the legal system capacity and fixed costs associated with revising the law as may be required by changes in the economic environment. In democracies, the legislature must approve any revisions in the law before corporations and investors can freely implement new techniques in their activities and transactions in practice. However, in any given period politicians have limited time and effort to devote to one area of the law, implying a fixed cost in revising the law. A good example illustrating such limited capacity and fixed costs is the US payments system. At the beginning of the twenty-first century the US had a nineteenth century payments system, relying mostly on paper checks and the mail, and significantly lagging behind other developed nations. Checks had to be physically transported from where they were deposited to a central operations center, then to the clearer and then back to the banks they were drawn on. This process significantly delayed business transactions as compared to electronic methods.

Despite repeated calls for changes from the banks and businesses, it appeared that the US Congress was not interested in solving this seemingly simple yet costly problem, until September 11, 2001. After the terrorist attack all commercial flights in the US were grounded for several days, completely halting the check clearing process. The Check Clearing for the 21st Century Act was signed in October 2003, allowing electronic images to be a substitute for the original checks, thereby offering the clearing process a means to circumvent the mail and transportation system.

These examples motivate our analysis on the advantages and disadvantages of a system based on rule of law and legal institutions vs. a system relying on alternative, nonlegal institutions. Using the law and the legal system as the basis of finance and commerce has many well-known

advantages. The legal system of a democracy ideally allows equal and full access by all and fairness in trials and settlements. With powerful enforcement mechanisms including civil and criminal penalties, disputing individuals, firms and organizations have strong incentives to follow the resolutions backed by courts and the government. This in turn provides long-term stability on how things should be done in practice. By using the entire legal operator and system, the marginal enforcement costs for an additional case can be low and this improves overall efficiency.

However, there are also disadvantages in using the law and legal institutions. First, recent research on political economy factors – in particular, work by Rajan and Zingales (2003a; 2003b) – argues that rent-seeking behaviors by vested interest groups can turn legal institutions into barriers to changes. We expect these problems to be much more severe in developing countries, where the costs of building good institutions can be enormous. We argue that one way to solve this problem is not to use the law as the basis for finance and commerce but instead to use alternative mechanisms. Second, as shown by the example of US payment system reform, the capacity of the legal system and legislature can impose significant fixed costs in revising the law and thus delaying the pace of innovations. These fixed costs can further increase if the people in charge of revising the law (e.g., politicians and judges) lack expertise in business transactions. In addition, interest groups with more resources may receive more protection than individuals, and this asymmetric protection system induces more rent-seeking behaviors and further deters innovations.

In the context of a fast growing economy, such as that of China or India, characterized by frequent, fundamental changes in the economic environment, the disadvantages of using the legal system can overshadow its advantages, and it may be better to conduct business without using the law and legal system. In addition to minimizing the political economy costs associated with legal institutions, using alternative mechanisms is advantageous in that such mechanisms can adapt and change much more quickly than the law. In particular, competition among different networks and

institutions can ensure the most efficient prevails, and it is not necessary to persuade the legislature and the electorate that the law needs to be revised when circumstances change.

There are also limitations to alternative mechanisms. By design these mechanisms often exist within a network (or networks) of firms and investors and may be inaccessible to outsiders. The limited access can come with the price of biases favoring insiders. With frequent changes and limited enforcement (since penalties cannot be imposed with authority), these systems generate instability and hence weak long-term incentives. While in a fast-growing economy profit-sharing in the long run and reputation-based mechanisms can ensure “good” (cooperative) behavior, these mechanisms may be insufficient to induce such behavior in environments with limited long-term profits. On the other hand, in such static environments with infrequent changes to the fundamentals (e.g., a developed economy with low growth rates), the fixed costs of using the legal system are relatively small (especially in large transactions); hence the law and legal system become superior to the alternative mechanisms.

Overall, we conclude that while legal mechanisms are an important part of developed economies’ institutions, alternative mechanisms play a much more prominent role in emerging economies and can be superior to legal mechanisms in supporting business transactions in certain industries or entire economies. Therefore, our main policy implication is that in emerging economies, alternative dispute resolution and contract enforcement mechanisms should be encouraged and developed alongside the development of legal and other formal institutions. The coexistence of alternative and legal mechanisms can also foster competition among (legal and nonlegal) institutions, which in our view is essential for creating an environment conducive for innovations. Competition from alternative institutions can also exert positive impact on the development of legal institutions, so that they are less likely to be captured by interest groups and become more efficient in adapting to changes.

The rest of the paper is organized as follows. In Section II, we present a series of examples demonstrating how alternative mechanisms work and illustrating the problems with using the law and legal system as the basis for commerce. In Section III we compare and contrast the advantages and disadvantages of alternative and legal mechanisms and discuss policy implications. Finally, Section IV concludes.

II. Examples of Alternative Mechanisms and Problems with the Legal System

In this section we first provide a set of examples on how alternative mechanisms work and substitute for legal mechanisms in different industries and countries. We then present examples that illustrate potential problems with using the law and legal system as the basis for finance and commerce. As indicated earlier, we focus on examples in developed countries such as the US in order to emphasize the nature of the inefficiencies of legal institutions.

II.1 Alternative Mechanisms in China and India

In the first set of examples we describe how alternative mechanisms substitute for legal mechanisms in China and India. Using information from the IMF, Table 1 presents GDPs based on simple exchange rates and purchasing power parity (PPP) and the growth rates in GDPs and per capita GDP (both in constant prices) during 1990-2007 for the top twenty countries in *each* category. China is leading the world in terms of growth rates of both GDP and per capita GDP over this period. At the end of 2007, China's PPP-adjusted GDP is the second largest in the world. If current growth rates persist, China's economy (PPP-adjusted) will overtake the US to become the largest economy in the world in 2010, and will double the size of US economy by 2020. While economic growth has widened the income and wealth gap in China as compared to the pre-reform

period, it has elevated hundreds of millions of people from absolute poverty.² India's records in economic growth are not as impressive as those of China, but its growth rates in GDP and per capita GDP are the third and fifth highest in the world, respectively, during 1990-2007. At the end of 2007, India's PPP-adjusted GDP is the third largest in the world.³ With 40 percent of the world's population and the two largest emerging markets in the world, China and India are expected to play an increasingly important role in the global economy for years to come.

[INSERT TABLE 1 NEAR HERE]

The remarkable economic performances of China and India also present significant counterexamples to existing literature on law, institutions, finance, and growth. The conventional wisdom is that a necessary condition for long-run economic growth is good (Western-style) institutions, including laws that protect small investors, a legal system that enforces contracts and resolves disputes, a financial system with efficient financial markets and a banking sector, and a democratic and benign government. However, AQQ (2005) and ACDQQ (2008) document that both China and India have ineffective legal systems, banks and markets that are small relative to the economies and have played a limited role in allocating resources to most efficient uses, and governments that are among the most corrupt in the world.

While there are many factors that have contributed to the economic growth in these two countries, we want to emphasize the role of financial systems in funding the growth of different corporate sectors.⁴ In our earlier work (AQQ 2005, 2008 on China; ACDQQ 2008 on India), we document that state-owned enterprises and publicly listed firms in these countries have much easier

² For example, using different metrics Ravallion and Chen (2004) report steep declines in the proportion of rural Chinese living in absolute poverty over the period 1980-2001.

³ The World Bank adjusted downward its PPP-based estimates of GDP for large emerging countries such as China and India in 2008; a third source, the CIA, produces PPP-figures that are in between those from the IMF and the World Bank. See Heston (2008) for a review and comparison of different PPP-based GDP figures and methodologies.

⁴ For an excellent review of China's economic growth during the past thirty years, see the book, "China's Great Economic Transformation," edited by Brandt and Rawski (2008).

access to the legal system and banks and financial markets than non-state, non-listed firms. Most of the non-state, non-listed firms are small and medium firms, and to a large extent conduct business outside the legal system and rely on nonlegal methods based on reputation, relationships and trust to settle disputes and enforce contracts; most of these firms' financing comes from alternative channels such as trade credits and funds from family and friends. Interestingly, non-state, non-listed firms have been much faster and provide most of the economic growth and employ most of the labor forces in both countries, and the dominance of this sector over state and listed sectors is especially pronounced in China. These findings suggest that alternative financing channels, along with nonlegal mechanisms, might be superior to bank and market finance, along with the legal and other formal institutions. We formalize and discuss this argument below.

These two countries also present distinctly different cases in their histories of developing Western-style legal and other formal institutions. Transiting from a socialist system to a market-based system, China had no formal commercial legal system and associated institutions in place when its economy began to take off in the 1980s. However, historically China had highly commercialized societies without the development of Western institutions. India, on the other hand, has a long history of Western legal institutions and financial systems due to its colonial ties to the UK. Based on the British judicial system, India's formal legal system dates back more than two centuries. The State Bank of India, the largest commercial bank in the country in terms of deposits as well as assets, is over two hundred years old and thriving. The Bombay Stock Exchange (BSE), at 130 years, is the oldest in Asia. Yet, Indian firms, like Chinese firms, generally conduct business with little reliance on the legal system.

What economic lessons can be learned from the remarkable performance of China and India? Are they simply applying the conventional wisdom, or are they doing something fundamentally different that (Western) economists have yet to fully understand? In this regard,

China presents the extreme example. In the West, we take it for granted that finance and commerce should be undertaken using the law as the basis for contracts. Many would agree that the same should be applied for China:

“The modern corporation based on a Western model would be the essential vehicle for private economic development” (China 1904).

Interestingly, this statement was not written today but was the view of China’s first Company Law in 1904 (*Gongsilü*), drafted by the then newly created Ministry of Commerce (*Shangbu*) of the waning Qing government and aimed at promoting China’s industrial development. Several subsequent versions of the Company Law (1904-1946) tried to promote the development of share-holding corporations with limited liabilities, but despite these attempts the model of Western-style corporations was never taken up in China. An important factor is that the philosophy of having a disperse ownership that included outsiders ran directly against the traditional Chinese model of keeping business within the family. Indeed, most firms’ fear of incorporation stemmed from their distrust of government and unwillingness to let strangers gain partial control of the firm.⁵

Despite the lack of rule of law in finance and commerce and their separation from the legal system, China had a highly commercialized society. The earliest form of capitalism can be traced back to the late Ming Dynasty (seventeenth century), with commerce initiated in the Zhejiang-Jiangsu area and further developed during the Qing Dynasty (seventeenth to early twentieth century). The Opium War (1840s) between China and Great Britain destroyed China’s sovereignty, but it brought Western-style legal and capital systems into China’s coastal areas (until 1949). During this period, foreign systems and the Chinese system co-existed and commerce boomed. Yet, despite the entrance and development of numerous Western-style courts in Shanghai and other

⁵ For more descriptions of China’s current financial system see AQQ (2005b; 2008). For more anecdotal evidence on the development of China’s financial system in the period discussed, see, for example, Kirby (1995) and Lee (1993).

major coastal cities, most business-related disputes were resolved outside courts. Since the Qing Dynasty, dispute resolution by guilds (merchant coalitions), families, and local notables based on explicit and implicit regulations of guilds, family traditions, and social norms was commonplace. Chinese firms on the mainland (pre-1949) and later in Taiwan (after 1949) did not use the provisions of the law but again conducted commerce outside the formal legal system. Modern equivalents of these dispute and contract enforcing mechanisms are arguably behind the success of Chinese firms since 1979.

The development of China's financial system from the late nineteenth century to the early twentieth century was highlighted by the emergence of Shanghai as the financial center of China and Asia. With thriving entrepreneurial and trading activities, financial institutions proliferated and financial innovations surged. Merchants used up to eleven currencies in their transactions, some of which were printed by local banks. The exchange rates of local currency saw wide fluctuations; many unregistered local banks (*diaotang*) engaged in high-leverage credit transactions with little capital reserves and defaulted frequently. At the same time, merchants' fear of risk spawned an active insurance industry, which was first introduced by the British. Insurance on real estate, ships, and goods became routine, with collateral and personal guarantors accompanying large transactions to reduce the risk of non-payments. To alleviate the problems of asymmetric information, foreign merchants hired Chinese middlemen (and guarantors) to select Chinese merchants. Chinese and foreign merchants also devised the "commission indent system," an early form of trade credit allowing firms and institutions to operate with minimum financial resources. The stock exchange in Shanghai was the largest in Asia for most of the 1920s and 1930s.

To summarize, relying on alternative mechanisms, China has a long history of developing finance and commerce outside the legal system. In fact, most of the development of the sophisticated financial system prior to 1949 coincided with one of the most volatile periods in

Chinese history characterized by political turmoil and (civil and foreign) wars. In recent years, there has been a concerted effort by the government to improve China's legal system, including passing new laws in finance and commerce similar to those in western countries. In our view, however, these laws have very limited impact in practice other than 'window dressing' for western investors who do not understand China.

A good example illustrating the ongoing legal reform is the bankruptcy law. A trial version was first passed in 1986, applying to state-owned enterprises (SOEs) only. There were very few bankruptcy cases, in part due to possible adverse effects on workers. The current version of the "Enterprise Bankruptcy Law" was passed in 2006 and became effective in June 2007. A much more comprehensive version than the trial version, it applies to all enterprises except partnerships and sole proprietorships. In many aspects it resembles bankruptcy codes in western developed countries. For example, secured creditors are paid ahead of employee claims, and allowed to vote in the reorganization plan. However, more than 2,000 financially distressed SOEs won a stay of execution by being excluded from the new law until the end of 2008, since workers' wage and benefits would still take precedence over creditors' claims. Moreover, in most of the bankruptcy cases, creditors have little influence on the process and are treated inconsistently; deviations from the stated priority rules are common place and final decisions are left to local judges, who often handle the cases not following the bankruptcy law, but rather other regulations from the State Council (see, e.g., Li (2001) for more details).

A review and comparison of India's corporate sectors also provide an example of the effectiveness of alternative mechanisms and problems with legal institutions. The Indian economy is unbalanced relative to other large economies, in that 52 percent of output is from services, 26 percent is from manufacturing and 22 percent is from agriculture (67 percent of workforce). Manufacturing industries have not done well, and a widely accepted reason is that they are

constrained by unions and traditional political economy factors, including corruption and bureaucracy in the government and legal system.⁶ New industries like software have done much better because they are not constrained by political economy factors as much and rely more on alternative mechanisms.

ACDQQ (2008) have conducted detailed surveys of more than 200 firms from the Small- and Medium Enterprises (SMEs) sector in India, and the results clearly favor the use of alternative mechanisms over the law and legal system. For example, when asked about their preferred actions following defaults, breaches of contract and disputes initiated by their business partners, over 80 percent of surveyed firms say they do not use the legal system at all. Out-of-courts channels of dispute resolution play a far more important role for these firms. About 50 percent of the firms surveyed do *not* have a regular legal adviser. When pressed for a reason, 63 percent of respondents who did not have legal advisors claimed they did not need lawyers as they knew all their business partners and could deal with them fairly. Clearly, the formal legal system takes a back seat while reputation, trust and informal personal relationships are the driving factors in screening potential business opportunities.⁷

The survey responses further indicate that not only is the law a disfavored means to resolve a breach that has already occurred or a dispute that has already arisen, but it also plays a weak role in dissuading future breaches and disputes. To this end, the survey findings indicate that legal sanctions are far less important than the demands and responsibilities of the networks within which they exist and function. For instance, in the case of default, late payment and a breach of contract, the primary concern is loss of future business opportunities or reputation; the fear of legal

⁶ For example, an estimated 25 million cases are pending before the courts in India and it will take more than 300 years to clear the backlog (Bearak 2000).

⁷ However, the courts, while not the most popular method of dispute resolution, appear to have some utility as a negotiating tool. When asked what a firm does to ensure payment or repayment (more than one response allowed), about 59 percent replied that they would go to court while leaving negotiation possibilities open.

consequences (adverse court sentence or jail term) is the *least* important concern, below even threat to personal safety.

Overall, the picture that emerges of the SME sector in India clearly indicates that the sector has little confidence in the legal system. It relies little on the courts in settling disputes and enforcing contracts and is minimally concerned about legal consequences of infractions. Nonlegal sanctions, on the other hand, are far more effective. This is also the finding of the Chinese corporate sectors today.

The limited role played by the law and legal system in the economic growth of China and India has been found in other prominent East Asian economies. Upham (2002) shows that Japan had developed economic and political systems operating outside the formal legal system before World War II. After WWII, despite the influence of the US, Japan's formal legal system actually shrunk during the high economic growth period, and alternative mechanisms, similar to those in China and India, were the main force in finance and commerce. In addition, some researchers argue that during early stages of development, it was informal relationships of trust, rather than law as commonly believed, that promoted the development of the financial systems in western European countries.⁸

II.2 Alternative Mechanisms Can Work in Complicated Transactions

One may wonder if the limited role of the legal system documented above is limited to simple financial and business transactions and a few developing countries. We next provide two examples to demonstrate that nonlegal mechanisms can deal with complicated, international transactions. First, the global diamond industry has historically operated outside the legal systems and systematically ignored state-created laws (e.g., Bernstein 1992). This is in part due to the fact

⁸ Greif (1989; 1993) documents the important role of reputation, trust and implicit contractual relations in the growth of Mediterranean traders' organizations in the eleventh century. Mayer (2008) offers a review of how similar mechanisms were behind the development of financial markets in the UK and the banking sector in Germany in the early twentieth century.

that legal contracts cannot be enforced since the value of each transaction (a particular diamond) is highly idiosyncratic and most diamond traders do not have access to capital markets, and hence calculated damages based on “what if” contingencies are not applicable. Moreover, it generally takes too long for courts to issue their decisions. In its place, the sophisticated diamond traders (belonging to trading clubs or bourses) who dominate the global industry have developed an elaborate, internal set of rules, complete with distinctive institutions and sanctions, to handle disputes. The arbitration process within the DDC (diamond dealers club) based on the rules is usually straightforward and quick, with rulings often involving parties simply splitting the differences in estimated damages. Typically, the private arbitration system keeps all judgments secret as long as payments are promptly paid. Given the long-term relationship of members and their interest in preserving their reputations, these simple rules work much better in the long run (even though they may not be fair in individual cases) and save costs. In recent years, the World Association of Diamond Bourses (WADB) has successfully shifted from the traditional relationship-based DDCs to a worldwide information technology based regime (a database containing reports of arbitrations from 20 plus member countries, many of which are in Asia). Only rarely do a state’s laws enter the discussions about the reform.⁹

Another industry that has relied on out-of-court mediations and arbitrations to settle disputes is reinsurance. Reinsurance is the practice where an original insurer, for a definite premium, contracts with another insurer or insurers, to carry a part or the whole of a risk assumed by the original insurer. While the earliest reinsurance contract can be traced to fourteenth century Italy (e.g., Kopf 1929), the first use of an arbitration clause in an insurance contract was, by most accounts, the one in the Insurance Company of North America in 1793 (e.g., Winn and Davis 2004).

⁹ There is the argument that the bypassing of the national legal systems by the diamond industry has led to lack of accountability and transparency in diamond producing countries, especially concerning miners in Africa (see, e.g., the Smillie et al. (2000) report on Sierra Leone). However, the expansion of WADB has actually restricted the monopoly power of the DeBeers Cartel, the largest supplier of diamond worldwide, which has its own dealers (Bernstein 1992).

The original arbitration system requires each party to appoint their own arbitrator and typically requires the two party-appointed arbitrators to appoint a third arbitrator referred to as an “umpire.” In practice, however, it is the parties and their outside counsel who play a large role in the selection of the umpire. This often results in disagreements, especially in large transactions, which delay the appointment and hence the arbitration process as a whole.

In recent years the industry has been revising the traditional procedure in order to expedite the process while still preserving its fairness. Industry experts have turned to other industries where arbitration has been used most successfully, such as securities arbitration, where the New York Stock Exchange and the National Association of Securities Dealers disseminate and continually refine and improve a set of rules (e.g., Kondo 2007). The Dispute Resolution Protocol, developed by the Conflict Prevention & Resolution International Industry for the reinsurance business, reflects these new ideas and changes. It is non-legally binding for members. Based on best practices from the field, the Protocol, among other things, simplifies and standardizes the process of selecting neutral arbitrators and has been endorsed by leading companies such as Lloyd’s. This example demonstrates the importance of adapting to changes quickly as a main condition for the long-term viability of a dispute resolution mechanism.

II.3 Intellectual Property Rights and Innovations

As discussed earlier, one of the cornerstones of Western law and institutions is property rights. A “hot-button” issue in property rights is the protection of intellectual property rights and their role in economic growth, which is also at the center of our comparisons between the two different systems of finance and commerce. Due to space limitations we cannot review all the evidence on intellectual property rights (see, e.g., the OECD (2004) report and the Bessen and Meurer (2008) book for excellent reviews). We focus on two aspects of intellectual property rights.

First, whether the protection of exclusive rights (through patents, copyrights, trade secrets, trademarks, etc.) has a positive impact on the pace of innovations and second, the problems of using the law and legal institutions as the basis for disputes related to intellectual property rights.

In almost all the countries with laws on intellectual property rights, the scope of patentable subject matter has traditionally *not* included fundamental scientific discoveries. A frequently mentioned rationale for this omission is that, given the far-reaching impact in many fields of these discoveries, it would be impossible to outline the boundaries of the patent protection. In fact, whether the boundary of a patent can be precisely defined is an important determinant of effective enforcement of the patent law (e.g., Bessen and Meurer 2008). Once the patent is approved and issued, the primary forum for resolving disputes is the (federal) courts, which have exclusive jurisdiction over disputes involving the infringement of patents and appeals of court decisions.

There is an extensive literature in industrial organization in economics examining the relationship between the protection of intellectual property rights and the pace of innovations during the past three decades, and the research yields mixed findings. In the chemicals and pharmaceuticals industries, stronger and more effective protection has been found to lead to more R&D spending and innovations in developed countries. This positive relation is attributed to the fact that most patents are valuable with clearly defined boundaries. This, in turn, helps keep litigation costs (of alleged infringers) low. However, it is unclear whether the most important inventions and discoveries in the chemicals and pharmaceuticals industries were made under the protection of property rights. Table 2 presents the development of some of the most important (and profitable) medical breakthroughs during the past 150 years. It is interesting to see that the majority (especially before 1950) of the discoveries was made by university researchers (not affiliated with corporations) and the initial invention was *not* protected by any patents. In some of the cases the patent holder is not the original inventor or discoverer.

[INSERT TABLE 2 NEAR HERE]

As an example the process of discovering and producing penicillin is illuminating. While widely believed to have been discovered by Alexander Fleming (as shown in Table 2) in 1928, several others had discovered its bacteriostatic effects as early as 1875. The real challenge of the new “wonder drug” was how to produce it in large quantities. This period coincided with WWII, during which penicillin significantly decreased the number of deaths and amputations caused by infected wounds among Allied Forces. Due to the large demand and costs of mass production, the price soared and a large amount was reserved for military use. A team of British and American scientists finally made a breakthrough in the early 1940s allowing rapid production of the drug. Penicillin production was quickly scaled up and made available in quantities necessary to treat Allied soldiers wounded on D-Day. As production rose, the price dropped from being nearly priceless in 1940, to \$20 per dose in July 1943, to \$0.55 per dose by 1946. Andrew Moyer, a member of the research team, was granted a patent in the US for a method of mass production of penicillin in May of 1948, after the commercial value of the drug had plummeted. Other researchers and producers of penicillin had applied for patents in other European countries but the applications were turned down, as it was deemed unethical to provide exclusive rights for an invention that can save lives. In fact, the attitude of governments and societies toward using patents and copyrights became increasingly pro-rights holders only after World War II.¹⁰

Outside the chemical and pharmaceutical industries, prior economic research finds that in many developed countries, there is no positive relation between the protection of intellectual property rights and the pace of innovations. Instead, excessive protection deters competition, which

¹⁰ Thomas Jefferson, a prolific inventor and founding father of the US Constitution, was known for his suspicion of granting monopoly power to inventors (“no patent for ideas”). During his term as the Examiner of American Patents, he insisted on thorough examination of the originality and novelty of an invention applied for patents. During the second half of the nineteenth century, an abolitionist movement, which promoted free trade and viewed patents as anti-competition analogous to tariffs on imports, halted the adoption of patent laws in European countries. In particular, the Netherlands repealed its patent legislation in 1869 and did not reinstate the patent system until 1912 (e.g., Khan 2005).

is another important factor in spurring innovations, and small inventors do not benefit from the laws on intellectual property as much as large corporations. In addition, based on changes in patent laws and enforcement regulations, Lerner (2002; 2005), among others, finds only weak or no evidence that *strengthening* patent rights and the enforcement of patent laws spur the pace of innovations across developed countries.

Research in developing countries also generally fails to establish a positive relationship between the protection of intellectual property rights and the pace of innovations. This is due to weak enforcement of such rights and the lack of other relevant institutions.¹¹ China is often singled out as notoriously bad in protecting intellectual property rights, as copying and imitation via reverse engineering is a prevalent strategy across industries. Legal actions by foreign firms have been nearly useless in preventing these activities.¹² As argued above, despite efforts by the government to pass new laws and strengthen existing ones, including those on intellectual property rights, in part as a response to mounting international pressure, it is doubtful that these efforts will have any system-wide impact. First, there is no systematic statement of the law of property or clear definitions of private property rights. Second, law enforcement is likely to be ineffective due to the intrinsic conflict of interest between fair play in practicing law and the monopoly power of the single ruling party, especially in cases in which government officials or their affiliates are involved (e.g., Clarke et al. 2008). Notably, though, while the protection of intellectual rights in China has been poor, the pace of innovations has been furious due to the pressure of competition.

One of the main problems of the patent system based on the law is that it motivates rent-seeking behaviors by interest groups. An example to illustrate such behavior is that companies,

¹¹ See, for example, Djankov and Murrell (2002) for a review on the obstacles in the development of commercial laws and legal system in the economies of transition in Eastern Europe and Vietnam.

¹² For example, the Chinese car Chery QQ appeared six months before the Chevy Spark, which it was a copy of, and the Shuanghuan Automobile's CEO model is remarkably similar to a BMW X5. For more details and other Chinese "knockoffs" of Japanese, European, and American cars, see CNNMoney.com (http://money.cnn.com/galleries/2008/fortune/0810/gallery.china_cars.fortune/).

especially large corporations with abundant resources, come up with numerous *nonessential* inventions to pad the one significant (patented) invention or establish a new standard in production (e.g., Dewatripont and Legros 2007). The creation of such a standard can impact the use of many different technologies – in the case of mobile technology, for instance, a production standard on a new handset requires the use of more than a thousand technologies protected by patents. By jamming the patent system with extra patents or standards the patent holders can essentially block or delay innovations by competitors. This is what has led to the FRAND concept – “fair, reasonable and non-discriminatory royalties.”

Another form of rent-seeking behavior is that patent holders, especially those with more resources, seek the best possible legal venue to maximize the likelihood of winning a lawsuit against patent or copyright infringements. This type of behavior runs against the principal that the legal system within a democracy should be based on fair procedures and should allow equal access to all. The rise of Marshall, a small town in eastern Texas, as the center of patent-related litigation is an interesting case study (e.g., Creswell 2006). According to *LegalMetric*, a legal data and analysis company, the Federal Eastern District of Texas (which also includes the rural towns of Tyler and Texarkana), now handles the largest amount of patent litigation cases in the country – up to one third of all new cases and an even higher fraction of all cases involving a US firm suing foreign firms or individuals, surpassing courts in Chicago, Manhattan, and Los Angeles, historically home to the largest number of new patent cases.

Many attribute this phenomenon to T. John Ward, the federal judge in Marshall. Since he joined the Eastern District of Texas, the district has seen a tenfold increase in patent cases since 1999 (14 cases in 1999 and 234 in 2006). Judge Ward has been described as pushing cases through quickly, and his court has been described as a “rocket docket” for its speed – each side in a case might receive between 9 and 15 hours for evidence, compared to other courts in which it may take a

month or more to do the same. While there is disagreement as to whether the jurors from the district are “patent friendly,” most observers believe that plaintiffs, especially US firms suing foreign firms and individuals over patent infringements, have a significant advantage because they hire lawyers or legal consultants who are familiar with Judge Ward’s style and know the jurors and benefit from that information. Overall, plaintiffs (patent holders) have won much more frequently (and have done so in a short period of time no less) in the district than anywhere else in the country.

In our final set of examples illustrating problems of intellectual property rights, we examine recent innovations in communications and knowledge industries based on Internet revolutions. Some of these inventions are free of charge and are not protected by patents or copyrights, while others do charge and are protected. As discussed above, when it is difficult to determine whether an invention has broached the boundary of a patent, as is often the case for Internet related innovations, enforcement efforts become ineffective and may cause rent-seeking behaviors to escalate.

On the knowledge front, SSRN (Social Science Research Network) and JSTOR are great academic inventions that bring new working papers and published articles, in electronic format, to individual researchers worldwide essentially free of charge (based on institutional subscriptions). For the general public, Wikipedia, a multilingual, web-based platform with free content, is quickly becoming the most useful encyclopedia. Written collaboratively by volunteers from around the world, the Wikipedia articles provide links to guide users to related pages with additional information and offer a useful point to begin research on almost any subject (including some of the topics discussed in this chapter). Since its creation in 2001, it has grown rapidly into one of the largest reference websites attracting over 600 million visitors annually by 2008.

While the growth of Wikipedia has met with little resistance from the traditional media companies, it is a totally different situation with Google’s equally ambitious “Print and Library Project.” Under the “fair use doctrine” of the US Copyright Law, Google’s ambitious plan has two

components, Google Publisher Program, in which a publisher holding copyrights to a book can authorize Google to scan the entire book into Google's search database, and Google Library Project, where some of the largest libraries (Harvard, Oxford and Stanford Universities, University of Michigan, and the New York Public Library) allow Google to scan materials. According to Google, for books/print materials in the public domain (not subject to copyright) from the libraries, Google will display the full text of the book with the search result; for those that are still covered by copyrights, readers can only see a few sentences of the text around the search item; copyright holders can also exclude selected books from Google Print. Ever since the initial idea of the Project floated around, it was met with disdain from publishing companies. The Association of American Publishers, including well-known companies such as Penguin, McGraw-Hill, Pearson Education, Simon & Schuster and John Wiley & Sons, and the Authors Guild, the nation's largest organization of book authors, filed suits against Google in the second half of 2005. The legal action came after months of talks failed to hammer out an agreement and has held up the implementation of the project indefinitely. Even if Google wins in the US they may be sued again in other countries (e.g., in EU countries) with different and perhaps even more stringent copyright laws.

Another example is the Linux operating system, started in 1991 by Linus Torvalds. A Unix-like computer operating system, Linux is one of the most prominent examples of free software and open source development. Typically all underlying source codes can be freely modified, used and redistributed. Historically, Linux has mainly been used as a server operating system, and has risen to prominence in that area. How does Linux stack against the Windows system, the most prominent operating system released under a proprietary software license by Microsoft? Not surprisingly, Windows dominates the desktop and personal computer markets with about 90 percent of market share, as compared to 1 percent market share by Linux. In the servers market, Windows had a share of 36 percent (fourth quarter of 2007) while Linux had a share of 12.7 percent. As of November

2007, Linux powered 85 percent of the world's most powerful supercomputers; in February 2008, Linux powered five of the ten most reliable Internet hosting companies. Proponents of free software argue that the key strength of Linux is that it respects what they consider to be the users' essential freedom – to run, study, change, and to redistribute copies with or without changes free of charge.¹³

Our final example regards music (and movie) downloads, both legally and illegally, and the status of the music (movie/entertainment) and recording industries. Downloading music first became popular with the file sharing technologies such as peer-to-peer networks, with individuals possibly knowingly or unknowingly violating copyright laws by not obtaining permission or payments. The Recording Industry Association of America (RIAA) claims that this practice is damaging the industry, and a series of lawsuits led to many of these networks being shut down – with perhaps the best known example being Napster. Going after companies such as Napster is one thing, going after millions of people downloading and sharing music on a daily basis is another. However, RIAA and the recording companies are certainly trying, and have taken their crusade against pirating to a new level recently. In its federal case against Jeffrey Howell, who kept a collection of about 2,000 music recordings on his personal computer, the industry maintains that it is *illegal* for someone who has *legally* purchased a CD to transfer that music into his own computer (Fisher 2007).¹⁴ Many observers of the industry believe that RIAA's campaign against its own customers is a classic example of an old media company clinging to a business model whose time is past.

We end this subsection with a comment on the effectiveness of using lawsuits to protect patents and copyrights. As in the case of music downloads, the efforts by vested interest groups

¹³ Nobody registered the name *Linux* till August 1995, when William Della Croce, Jr. applied for a trademark and demanded royalties from Linux distributors. Mr. Torvalds and other affected organizations sued him and the case was settled in 1997. Mr. Torvalds has stated that he trademarked the name to prevent others from using it, but was bound in 2005 by the US trademark law to take active measures to enforce the trademark. As a result, the Linux Mark Institute, holder of the name, had to request a fee be paid for the use of the name and a number of companies have complied.

¹⁴ Interestingly, researchers (e.g., Oberholzer-Gee and Strumpf 2007) have found that Internet music piracy not only does not hurt legal CD sales, it may even boost sales for some types of music.

seem to be largely ineffective when the public is engaged in the illegal act at low costs, but these efforts become more effective when a single company is leading the implementation of new technologies (e.g., Google's Print Project). The contrast in these cases, however, suggests that using the law as the basis for the protection of intellectual property rights can induce rent-seeking behavior by the interest groups that will have the most to lose given the new technologies, and their efforts can become significant barriers to changes and innovations.

II.4 Limited Capacity of the Legislature

Another potential problem of using the legal system in a democracy is that when there are fundamental changes in an economy so that the law and/or regulation must be revised, the legislature must approve any revisions before corporations and investors can freely implement new techniques in their transactions and interactions (without worrying about breaking the law). However, politicians have limited time and effort that can be devoted to any given area of the law, and hence there is a legislature capacity and a fixed cost in revising the law. The following example illustrates that such limited capacity and fixed costs can single handedly slow down the pace of financial and business transactions in practice.

Figure 1 compares payments systems in major developed economies. At the start of the twenty-first century the US had a nineteenth century payments system, relying mostly on checks and the mail, and significantly lagging behind other developed nations. While countries like Germany, the Netherlands, Sweden and Switzerland had almost completely abandoned checks (and rely instead on electronic payments systems), about half of all the payments in the US were still in the form of paper checks. Under the old Uniform Commercial Code, the only legally acceptable proof of payment was cancelled checks, or checks processed by both the deposited and paying financial institutions. Hence, checks had to be physically transported from where they were

deposited to a central operations center, then to the clearer and then back to the banks they were drawn on. This check-and-clearing process significantly delayed business transactions as compared to electronic methods.

[INSERT FIGURE 1 NEAR HERE]

How costly was this backward payment system? Using information from Humphrey et al. (1996) and Bolt et al. (2005), we can conduct a back-of-the-envelope calculation. From cross-country comparisons and analysis, these researchers suggest that there are savings of about 1-2 percent of GDP when a country moves away from paper checks (e.g., the US) and towards electronic-based methods. From Table 1, the US 2007 GDP was \$13,543 billion, which indicates the magnitude of savings from reforming the payment system to be \$135 billion to \$270 billion per year. With a 5 percent discount rate (roughly the risk-free rate in the US), the discounted present value of this savings (assuming a ten-year growing annuity of 2 percent per year to control for inflation) is between \$1.1 trillion to \$2.2 trillion; in other words, the magnitude of the savings is comparable or higher than the total cost of the most recent Iraqi war.

Despite years of calls for changes from the banks and businesses, the US Congress appeared not in a hurry to solve this seemingly simple yet costly problem. Without the approval of the legislature, banks cannot expedite the payment process due to the fear of lawsuits. Then, the tragic events of September 11, 2001 occurred and served as a catalyst for change. After the terrorist attack all commercial flights in the US were grounded for several days, completely halting the check clearing process. After the flights resumed, the call for change in the payments system finally resonated with Congress. The Check Clearing for the 21st Century Act (“Check 21 Act”) was signed in October 2003 and became effective one year later. The Check 21 Act allows electronic images of both sides of paper checks to be a “legally equivalent” substitute for the original checks, and these “substitute checks” can be exchanged among financial institutions including banks,

clearing houses and the Federal Reserve Bank (see, e.g., Board of Governors of the Federal Reserve System (2008) for more details). Therefore, the clearing process is no longer dependent on the mail and transportation system.

To summarize, in this section we presented examples to highlight two potential problems of relying on the law as the basis for finance and commerce: rent-seeking behaviors by vested interest groups and limited capacity of the legislature in approving changes to the law. We also argue that these problems are likely to be worsened in developing countries until they can develop sound legal and other related institutions. We also present examples to illustrate that alternative systems can work well outside the legal system in both developing and developed countries.

III. Legal Institutions vs. Alternative Mechanisms: Comparisons and Policy Implications

The above examples motivate our comparisons of two different sets of systems. The first system, employed by developed and democratic countries such as the US, commits to use the law as the basis for finance and commerce and legal institutions as the ultimate source for resolving disputes and enforcing contracts; further, changes to the law must be approved by the legislature and electorate. In the second system, symbolized by countries such as China, there is no systematic definition of private property rights or property law, and, in practice, nonlegal mechanisms are the norm for conducting business; the process of change in finance and commerce is often bottom up rather than top down. We make these classifications to better differentiate these two systems and facilitate the comparisons, but they may not be mutually exclusive when we look at a particular country. In fact, as the literature on legal pluralism (see, e.g., Merry (1988) for a review) shows, in many countries these two systems can coexist but do not necessarily work to improve each other.

In what follows we compare the advantages and disadvantages of conducting finance and commerce in these two systems. We then discuss conditions under which one of the two systems is

superior. Finally, we provide discussions on policy implications based on our analysis.

III.1 Comparing Legal and Alternative Mechanisms

There are well-known advantages of using the law and legal system as the basis for finance and commerce. The legal system of a democratic society allows equal and full access by all and promises fairness in trials and settlements. Backed by the government and legislature, the legal system also has the ultimate authority in its decisions on any and all disputes. The legal system is endowed with powerful enforcement mechanisms, including criminal penalties, such as imprisonment, as well as civil laws and financial penalties to affect people's behaviors. These enforcement mechanisms and penalties provide strong incentives for individuals and organizations to follow the resolutions endorsed by the legal system, which in turn provides long-term stability in the economy. The legal process, including resolution and enforcement, can be anonymous (e.g., details of a settlement of a dispute may not be disclosed) or transparent (the entire procedure of a high-profile trial may be covered by media). By using the entire legal system, the marginal costs for resolving an additional dispute and enforcing an additional contract can be reduced, and this improves overall efficiency.

However, there are also disadvantages in using the law and legal institutions. First, recent research on political economy factors suggests that rent-seeking behaviors by vested interest groups can turn legal institutions into barriers to changes. For example, Rajan and Zingales (2003a; 2003b) suggest that development of a formal financial system may trigger political economy costs, causing a disconnection between the level of financial market activity and economic development. Similarly, Acemoglu and Johnson (2005) find that while "contracting institutions," or laws protecting contracts between individual parties, do not affect long-term growth, "property rights institutions," or laws and regulations restraining powerful elites and the government, do affect

economic growth. We expect these problems to be much more severe in developing countries, where the costs of building good institutions can be enormous. We argue that one way to solve this problem is not to use the law as the basis for finance and commerce but instead to use alternative mechanisms, as the experience in China and India documented earlier.

Second, in democracies there can be a lengthy political process before significant changes can be approved (by the majority of the electorate or legislature), and the people in charge of approving or disapproving changes (e.g., politicians and judges) may lack expertise in the business transactions under scrutiny and have limited capacity (time and effort) to study the proposed changes. The process of passing the Check 21 Act epitomizes this capacity issue. In addition, as demonstrated in examples in the previous section, interest groups with more resources may receive more protection than individuals and organizations with fewer resources. This asymmetry in protection induces more rent-seeking behaviors and further deters innovations.

Unlike the legislature, which has monopoly power and authority in revising the law, one of the main advantages for alternative mechanisms, along with the bottom up process for changes, is that such mechanisms are more likely to foster competition among different mediation/resolution agencies/organizations. Competition can ensure that the most efficient mechanism prevails – for example, only experts are involved in the rule-changing process. Competition can also limit rent-seeking behaviors by one or more groups. Clearly, alternative mechanisms as described can be much faster in adopting new rules to deal with changes in finance commerce since these changes do not require the permission from the legislature or electorate.

One of the main disadvantages of the alternative mechanisms is the lack of enforcement power and authority. Without the backing of the government and judicial system, alternative mechanisms can only rely on reputation along with economic and financial incentives (e.g., avoiding future losses due to sanctions by other members of the network or coalition) and mutual

monitoring to enforce contractual agreements. These methods may be insufficient to ensure good behavior if future losses are not substantial relative to the gains that can be made today, or if these losses can be recuperated by entering other lines of business or networks. Another negative for alternative mechanisms is that by design they exist among a network and thus may be inaccessible to outsiders; partial access by outsiders may come with the price of biased outcomes in dispute resolution favoring insiders. In addition, frequent changes adopted by a network (or networks) create instability in the entire economy and hence weak long-term incentives.¹⁵

These advantages and disadvantages lead to the tradeoffs of the two systems in different economic environments. In *static* environments with infrequent and predictable changes (i.e., mature and slow-growing economies and industries), the advantages of the legal mechanisms dominate the disadvantages. First, the strong incentives provided by the enforcement mechanisms of the legal system imply that efficient systems can be designed that do not rely solely on positive monetary incentives. Second, the fixed costs of using the legal system when changes occur can be negated by the infrequent revisions of the law and by a few large scale transactions; the legislature and the judicial system can appoint experts to be involved with the process of changing the law and grant them the authority in decision making. The combination of effective enforcement and infrequent changes also implies that there is stability in the system, which in turn creates strong long-term incentives for economic agents to play by the (universal) rule.

In *dynamic* environments with frequent and unforeseen shocks (i.e., new industries and/or emerging, fast-growing economies such as China and India), however, the disadvantages of legal mechanisms are magnified and can outweigh their advantages. The lengthy approval process by the legislature and electorate of any change to the law, along with the limited capacity and possible lack of expertise by the judges and politicians, means that the legal system is slow in reacting to changes.

¹⁵ See Dixit (2004) for an excellent review of the advantages and disadvantages of the alternative mechanisms.

Moreover, a legal system captured by interest groups can in fact oppose changes, and with its monopoly power it can become a barrier to competition and innovations. On the other hand, alternative mechanisms can adapt to changes much more quickly, since competition ensures that the most efficient mechanism will be implemented quickly, and this process does not require the approval of the legislature. Weak enforcement power and long-term incentives of the alternative mechanisms can be significantly strengthened by effective reputation mechanisms as long as there are long-term profits to be made and shared by participating individuals and organizations.

The interaction between legal and alternative mechanisms is another reason why alternative mechanisms can promote economic growth and improve social welfare. Since most of the laws are adopted from best practices, having a viable system of alternatives can thus improve the efficiency of legal institutions, especially in dynamic environments. Competition among formal and alternative mechanisms can also ensure that the best mechanism will be eventually adopted in the entire economy, and this is especially important in environments where special interest groups can easily capture the legal system. A fair and functional legal system can also improve the effectiveness of alternative mechanisms by adopting the best rules and enforcing the changes in the entire economy and by instilling stability amid frequent changes.

III.2 Policy Implications

It is not our intention to downplay the importance of the role of the law and legal system in finance and commerce. Our ultimate goal is to help design the optimal combination of legal and alternative institutions that best suit a country's needs. To this end we have compared the advantages and disadvantages of two systems operating based on the law and legal institutions versus alternative mechanisms. We conclude that legal mechanisms are an important part of developed economies' institutions, providing stability and strong long-term incentives. This

conclusion is based on the premise that there are infrequent shocks to the economy that cause fundamental changes in ways that business is conducted, that the legal system allows full access by all and promises fair resolution of disputes and enforces the rules uniformly.

However, the assumptions making legal institutions the optimal system in developed countries are unlikely to hold in many emerging economies. A fast-growing economy, such as that of China and India, is often characterized by frequent shocks to the fundamentals of the economy, which make repeated changes to the practice of finance and commerce a requirement, not a choice. Given that it typically takes years to build a well-functioning legal system and other formal institutions, the fixed costs of using the legal system can be quite high in a dynamic economy, even if the system provides fairness and expertise when dealing with changes in the law.

A much more severe problem with the legal system, perhaps, is the political economy factor. It would be much easier for interest groups to capture the legal system and government in a country with underdeveloped institutions than in a country with developed institutions. As a result, an economy relying on law and legal institutions as the sole basis for commerce may find that such reliance is, in fact, a barrier to change and innovation.

Therefore, we argue that alternative mechanisms play a much more prominent role in emerging economies and can actually be superior to legal mechanisms in supporting business transactions in certain industries or entire economies. Our main policy implication is that in emerging economies, alternative dispute resolution and contract enforcement mechanisms should be encouraged and developed alongside the development of legal and other formal institutions. In particular, measures that help foster competition and reduce entry barriers are welfare enhancing. The coexistence of and competition between alternative and legal mechanisms can also exert positive impact on the development of legal institutions, so that they are less likely to be captured

by interest groups and become more efficient in adapting to changes.¹⁶ Whether and how a transition from a system dominated by alternative mechanisms to one using the law and legal institutions as the focal point depends on the country's economic history and growth potential, as well as the workings of many other social and cultural factors that help build the social norms in the society and business communities.

IV. Concluding Remarks

In our view China and India's economic success contains important lessons. While using the law in finance and commerce has become a widely accepted idea, it is based on the history of institutional development in the West. We have argued that it can be optimal in static environments with infrequent changes. In dynamic environments such as China and India it may be better to use other mechanisms that do not rely on the law because this reduces the inefficiencies associated with political economy factors. Designing economic institutions that minimize political economy problems by not relying on the legal system is one of the keys to fast economic growth.

¹⁶ Qian and Weingast (1997) argue that government decentralization since 1979 has helped foster competition among local officials and preserve market incentives in China. Allen and Qian (2008) argue that competition among officials from different regions curtails the negative impact of corruption on economic growth in China.

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Table 1 The Largest 20 Economies in the World: GDP and Growth

Rank	GDP in 2007 (simple exchange rates)		GDP in 2007 (PPP)		GDP growth: 1990-2007 (constant prices)		Per capita GDP growth: 1990-2007* (constant prices)	
	Country /Region	US\$ Billion	Country /Region	Int'l \$ billion	Country /Region	Annual growth	Country /Region	Annual growth
1	U. S.	13,794	U. S.	13,543	China	10.3%	China	9.3%
2	Japan	4,346	China	11,606	Vietnam	7.6%	Vietnam	6.0%
3	Germany	3,259	India	4,727	India	6.3%	Korea	4.7%
4	China	3,249	Japan	4,346	Malaysia	6.2%	Taiwan	4.5%
5	U. K.	2,756	Germany	2,714	Chile	5.6%	India	4.4%
6	France	2,515	U. K.	2,271	Korea	5.5%	Chile	4.2%
7	Italy	2,068	France	2,040	Taiwan	5.3%	Poland	3.9%
8	Spain	1,415	Brazil	2,014	Bangladesh	5.2%	Sri Lanka	3.8%
9	Canada	1,406	Russia	1,909	Sri Lanka	5.0%	Malaysia	3.7%
10	Brazil	1,295	Italy	1,888	Yemen, R.	5.0%	Thailand	3.6%
11	Russia	1,224	Spain	1,310	Thailand	4.6%	Bangladesh	3.1%
12	India	1,090	Korea	1,250	Pakistan	4.6%	Indonesia	3.0%
13	Korea	950	Mexico	1,250	Egypt	4.5%	Peru	2.9%
14	Australia	890	Canada	1,217	Iran	4.5%	Iran	2.9%
15	Mexico	886	Indonesia	1,054	Peru	4.4%	Argentina	2.8%
16	Netherlands	755	Taiwan	750	Indonesia	4.4%	Egypt	2.3%
17	Turkey	482	Australia	731	Turkey	4.0%	Turkey	2.3%
18	Belgium	443	Turkey	723	Argentina	4.0%	Pakistan	2.3%
19	Sweden	432	Argentina	691	Poland	3.9%	Spain	2.2%
20	Switzerland	414	S. Africa	664	Philippines	3.8%	Australia	2.2%

Notes: *: Countries with population less than 20 million or GDP less than US\$ 20 billion are excluded from this ranking.

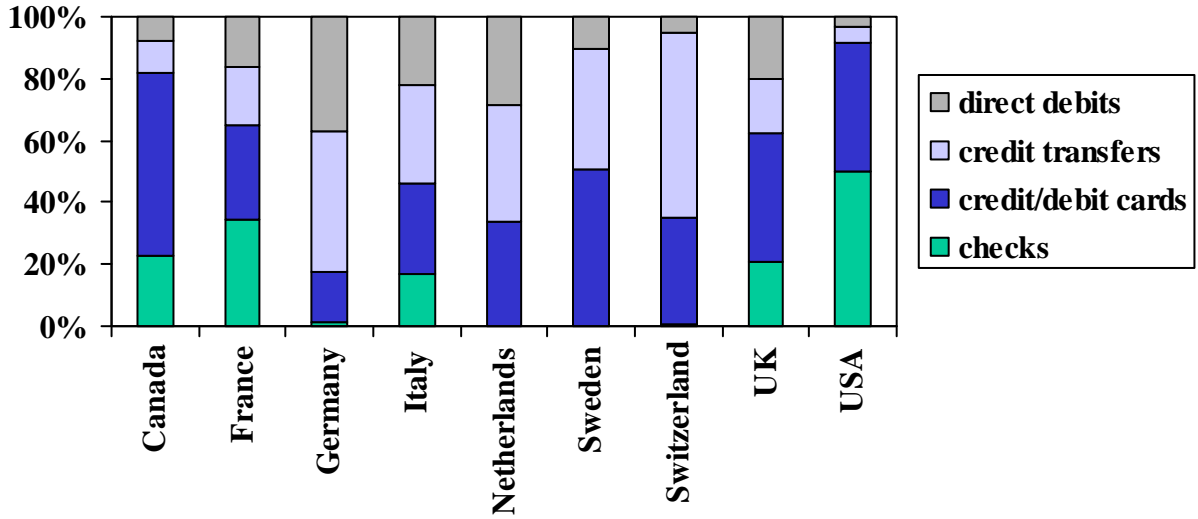
Source: IMF World Economic Outlook Database 2008.

Table 2 Major Medical Inventions and History of Patents

Name	Purpose of Use	Inventor	Invention Time	Have a patent?	Patent Holder	And When?
Ophthalmoscope	Instrument used to examine the eye	Charles Babbage	1847			
		reinvented: Hermann von Helmholtz	1851			
		refined: William Allyn & F. Welch	1915	US Patent: 4065208	Welch Allyn	1915
Hypodermic needle	A hollow needle used with a syringe to inject substances into the body	Charles Pravaz & Alexander Wood	1853			
		Disposable syringes: Arthur E. Smith	1949-1950	8 US Patents	Arthur E. Smith	1949-1950
		Disposable syringes: Phil Brooks	9-Apr-74	US Patent	Phil Brooks	9-Apr-74
		Hypodermic needle: K. Simm & D. Emis	31-Aug-04	US Patent	K Simm & D Emis	31-Aug-04
Carbolic acid (phenol)	sterilize surgical instrument to clean wounds	Joseph Lister		US Patent: 1950359		
Rabies vaccination	To prevent rabies (viral neuroinvasive disease)	Louis Pasteur	Jul 6, 1885	No		
Contact Lens	A corrective, cosmetic or therapeutic lens	Descriptions of lenses: Leonardo da Vinci	1508			
		Corneal contact lens: Rene Descartes	1632			
		Water-filled glass tube with lens: T. Young	1801			
		Invented and made: Adolf Eugen Fick	1887			
		Grinding to fit eye's surface: John Herschel	1827			
		US made plastic lens: W. Feinbloom	1936			
		Plastic lens: Kevin Tuohy	1948			
		Soft and gas-permeable lens	1970s			
X-ray	Used for diagnostic radiography	Wilhelm Conrad Rontgen	Nov 8, 1895			
Electrocardiogram	Graphic produced by an electrocardiograph of the electrical activity of the heart	String galvanometer: Willem Einthoven	1901	US Patent: 4457309	Elmeskog; Alf U.	Feb. 1982

Sphygmomanometer	A device used to measure blood pressure	R. H. Miller	1948	US Patent: 2560237	R. H. Miller	10-Jul-51
		Pocket sphygmomanometer: Man S. Oh	2002	US Patent: 6752764	Pocket: Man S. Oh	22-Jun-04
Penicillin	Treatment of bacterial infections	Sir Alexander Fleming	28-Sep-28	US Patent:	Andrew J. Moyer	25-May-48
Artificial pacemaker	A electrical device to regulate heart beating	Earl Bakken & C. Walton Lillehei	1957	US Patent: 4009721	Alcidi; Mario	23-Apr-76
Heart Transplant	Procedure for patients with heart failure or severe coronary artery disease	Christiaan Barnard	Dec, 1967	No		
MRI & fMRI	Imaging technique primarily used in Radiology	Paul Lauterbur & Peter Mansfield	1970	US Patent	R. Damadian	1974
CAT scan	Medical imaging using tomography	Godfrey Newbold Hounsfield Allan Mcleod cormack	1967-1972	US Patent: 3922552	Robert S. Ledley	25-Nov-75
Ultrasound scan	An ultrasound-based diagnostic imaging	Lan Donald	1953-1958	US Patent: 5860925	D. Liu; (conversion)	27-Jun-97
Artificial Heart	Prosthetic device implanted to replace heart	Robert Jarvik	1970's-1980's	US Patent: 3097366	Paul Winchell	16-Jul-63

Figure 1 Comparing Payments Systems in Developed Countries



Source: Bank for International Settlements, "Statistics on Payment and Settlement Systems in Selected Countries," March 2006, www.bis.org/publ.