

INNOVATION, INFORMATION
& THE POVERTY
OF NATIONS

ROBERT COOTER

This *Occasional Paper* is based on the first two chapters of a book in preparation by Robert Cooter and Hans Bernd Schaefer, currently called *Law and the Poverty of Nations*. A version of it will be published in the Florida State University Law Review.

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Within the context of the Friedrich Naumann Foundation's ideals, the publication promotes the ideals of innovation and competition, attributes central to a liberal democracy. It raises the argument that innovation is conducive to growth in developing countries. This should serve as motivation for ordinary South African citizens to become innovative and might even appeal to their entrepreneurial capabilities. The publication stimulates and enriches liberal debate, provides valuable arguments in support of innovation, and promotes the benefits of the rule of law. For these reasons, the Friedrich Naumann Foundation is proud of its association with the article and its value-adding potential.

Eva-Maria Köhler-Renfordt
Regional Director Africa
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Robert Cooter is Herman Selvin Professor of Law at the University of California at Berkeley. Professor Cooter is a pioneer in the field of law and economics. He earned a Ph.D. at Harvard University and began teaching in the Department of Economics at UC Berkeley in 1975. He joined the School of Law faculty in 1980. He has been a visiting member of the Institute for Advanced Study at Princeton and a recipient of various awards and fellowships, including Guggenheim, the Jack N. Pritzker Visiting Research Professorship at Northwestern Law School, and, most recently, the Max Planck Research Prize. He was an Olin visiting professor at the University of Virginia Law School and lectured at the University of Cologne in 1989. He is coeditor of the *International Review of Law and Economics*. He is one of the founders of the American Law and Economics Association and served from 1994 to 1995 as its president. In 1999 he was elected to the American Academy of Arts and Sciences.

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FOREWORD



For those of us who have spent significant amounts of time living in “Third-World” countries, it is obvious that there are many opportunities for improvement almost begging for someone to see and act upon them. But for the most part, that doesn’t happen. The opportunities are either ignored or blocked, either directly or indirectly. We see it all the time. I see it now.

There are many excuses given for a country’s lack of development. Often the forces of nature are blamed: storms, floods, drought, earthquakes, volcanoes, and even wild animals and mosquitoes. These are serious obstacles, but they are rarely decisive. Clear examples exist of adjacent countries with similar peoples, and facing similar challenges, but developing at quite different rates.

Even in cases where the country is blessed with an abundance of natural resources, a Third-World country still manages to earn its label by failing to use these resources to collective advantage. It fails to allow whatever human and financial capital it has to be employed in an appropriate and natural manner. The distinguishing feature of Third-World countries is that they waste their people’s time, their people’s talents, and their people’s endowments. They also waste the resources of well-meaning donors who send billions of dollars only to see those dollars largely consumed in overcoming logistical and administrative hurdles, with significant portions disappearing into secret bank accounts and into well-intended, but unsustainable, projects.

There is no joy in recognizing this. There can be joy only in finding and detailing the causes of these problems as a step toward achieving a solution. All countries began as undeveloped regions, with living conditions well below what we would now call “underdeveloped.” Why have some advanced while

others lag or stagnate? Whatever the natural challenges a country faces, it is the human factor that makes the difference in real progress. Natural resources do not develop themselves: they require a human to value them, and to work on them, and to serve them up to those who might benefit from, and find joy in, their use. Resources are nothing without people.

But what about those people? What are they without *other* people? Can any of us survive long without the co-operation and goodwill of others? Conflict, whether with nature or with other men, can often lead an individual to personal growth, with lessons learned, even if only a strengthening of character and faith. But conflict can just as often bring loss, whether of time, resources, or life itself. A determined belligerent can force us to change course, to expend resources in a fight that we would rather avoid, to sustain losses of life, treasure, and even know-how. Future generations might literally not know what they are missing.

None of us has known a time without conflict. But some of us have been fortunate enough to see less of it than others. Most of us are happy to have avoided wars and crime scenes. This relative peace gives us the opportunity to notice, and to dwell upon less obvious conflicts and hindrances. We are also able to notice that the avoidance of conflict is not merely due to luck. Those of us who avoid conflict are able to focus more clearly on our goals, to get along and to prosper. We also advance as a people in proportion to our success in minimising conflict within our societies.

Conflict can, of course, be detected in many forms. It is not experienced only by the “bleeding crowd.” None of us really escapes it: it is found wherever personal interests differ. But we, as individuals and as societies, do somehow learn to reduce or avoid it, whether through our culture, our habits, or our laws. We have, in some societies, learned to restrain our personal and political whims, and to live in a manner in which we give one another incentives to cooperate, and to produce, rather than to take.

So what secrets have we discovered? What devices have we developed? What do “successful” nations have that others do not? How can we look forward, rather than always looking over our shoulder? It is with the positive goal of answering such questions that the FMF has the pleasure of publishing this thoughtful monograph by Professor Robert Cooter.

Robert Cooter is Herman Selvin Professor of Law at the University of California, Berkeley. He has published many highly regarded books and arti-

cles over several decades, but is perhaps best known as a co-author (with Thomas Ulen) of the popular textbook, *Law and Economics*. In the essay to follow, Professor Cooter brings his understanding of law and economics to bear on the problem of what governments can, and cannot, expect to achieve, and how this should condition the development of law and governmental activity.

As suggested in the title, *Innovation, Information, and the Poverty of Nations*, Cooter zeroes in on the key consideration in economic development: the use of knowledge in society, and the incentive (and the freedom) to act on it. He emphasizes the distinction between public information and private information, and explains why one type is associated with innovation and the other is not. This helps explain much of our experience with “industrial policy,” and warns about what we can expect of it in the future.

Professor Cooter helps us to recognize and to understand the difference between effective law and ineffective law, and between helpful law and defective law. His explanation and elaboration of the relationships between information, capabilities, incentives, innovations, and how governments deal with property and contract law offer a rewarding read. The observations and opinions expressed in this monograph are those of the author, and not necessarily those of the Free Market Foundation; but the FMF takes pride in presenting this thoughtful work to a wide readership, and hopes that it will help to invigorate the global discussion of this important topic.

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ABSTRACT

Sustained economic growth occurs in developing nations through improvements, or innovations, in markets and organisations. Entrepreneurial innovation resembles biological mutation that is unpredictable before it occurs and understandable afterwards. Entrepreneurial innovation is unpredictable because it begins with an innovator who acquires private information and earns extraordinary profits. It is understandable because it ends with the public figuring out the innovation with investors earning ordinary profits. But these characteristics of innovation have important consequences for law and policy if they are to foster economic growth. Specifically, government officials who rely on public information cannot predict which firms or industries will experience rapid growth. Consequently, industrial policies that promote growth are unlikely to succeed. Proponents of industrial policy today make the same mistake as the mercantilists whose interventions Adam Smith attacked as a cause of national poverty. In contrast, secure property and contract rights, and effective business law (especially the laws regulating financial markets), create conditions under which competition naturally produces entrepreneurial innovation and nations become rich. Read in this setting, it follows that a potentially major obstacle to sustained economic growth in poor countries today is ineffective civil and business law.

CHAPTER 1

INTRODUCTION



What explains the poverty of nations? In the conditions of the modern world, defective law causes, or at least aggravates, national poverty. Lawyers distinguish between law-in-practice or law that controls behaviour, and law-on-the-books or written law. In this paper, the term “law” is taken to mean law that controls behaviour, not law that is merely written down. Law that controls behaviour is part of the social norms followed by individuals and organisations. When organisations follow law, the law becomes institutionalised. Refining this thesis, this paper argues that, in the conditions of the modern world, defective legal institutions cause national poverty.

A nation’s wealth comes from the productivity of its citizens, which depends on resources, technology and organisation. In the past, the uneven distribution of natural resources condemned some countries to poverty. Because of vast improvements in technology, nations can now overcome poor natural resources with good technology and organisation. By the end of the last century, the absence of major wars, collapse of communism, lowering of tariffs and falling transportation costs removed most obstacles to exchanging goods and ideas among nations. As a consequence, current conditions in the world economy mean that most international obstacles to acquiring technology are gone. Whereas nations can exchange goods and ideas, they must develop organisations, and developing good organisations is the unmet need to alleviate national poverty.

All nations now have the opportunity to escape poverty by developing productive organisations. Within a good legal framework, productive organisations develop naturally from competition among people. People feel intense rivalry over wealth. To gain wealth, people and organisations either can make

wealth or take it from others. An economy grows when rivalry among people directs them to make wealth. Good legal institutions provide a framework of competition that encourages making wealth and discourages taking wealth. As people compete to improve the productivity of their organisations, they enrich the nation. Conversely, an economy fails when rivalry among people directs them to take wealth from others. When some people take wealth from others by legal or illegal means, potential victims try to protect themselves. Offensive and defensive tactics divert effort and creativity away from production. Defective legal institutions provide opportunities for taking wealth from others that impoverish the nation.

Like compound interest on a debt, sustained growth moves faster than the popular imagination can grasp. To illustrate, imagine a banker who asks to be paid by placing one cent on the first square of a chess board, two cents on the second square, four cents on the third square and so on. Using only the white squares, the initial cent would double in value thirty-one times, leaving R21.5 million on the last white square. In this setting, the question of whether growth is faster in rich or poor nations will determine whether living standards in the world converge or diverge. If poor nations grow significantly faster than rich nations, the gap between them will close surprisingly quickly. Conversely, if rich nations grow significantly faster than poor nations, the gap between them will widen just as quickly. In fact, no general pattern exists for poor countries to catch up to or fall farther behind rich countries. Instead, some poor countries have grown faster than some rich countries, thus closing the gap, and some rich countries have grown faster than some poor countries, thus widening the gap.

To illustrate, at the beginning of the last century, England was richer *per capita* than Japan, and at the end of the last century Japan was richer than England. In 1900 Argentina's wealth *per capita* resembled the United States of America (US), whereas northern Italy was poorer than Argentina and the US. Today, northern Italy is richer on a *per capita* basis than the US and Argentina is poorer. If current trends continue, China will achieve a position in the world by 2025 that is unimaginable today for most people, whereas most African nations will fall significantly further behind.

Out of this evidence, however, emerges a common theme: to close the gap, poor countries need to create a framework for competition by developing effective civil and business law. To demonstrate this point, the innovation process

is analysed below. Developing an innovation requires communicating information about it to investors. Economic growth, consequently, requires uniting information and capital. However, using examples from Silicon Valley, it also is demonstrated below how delicate and elusive the problem is.

From this position, the monograph goes on to connect innovation to public policy. Government officials who rely on public information cannot predict which firms or industries will experience rapid growth. Consequently, industrial policies that attempt to promote growth are unlikely to succeed. When the mercantilists advocated extensive state intervention in markets in the 18th century, Adam Smith attacked these policies as a cause of national poverty. Proponents of industrial policy today make the same mistake as the 18th century mercantilists. Industrial policy cannot unite innovation and capital as required for economic growth.

Finally, the study aims to explain that law provides the framework to unite information and capital. Secure property and contract rights, and effective business law (especially the laws regulating financial markets), create conditions under which competition naturally produces innovation and nations become rich. Conversely, systematic defects in the legal institutions of poor countries, which are described later on in the paper, retard innovation and keep countries poor.



CHAPTER 2

SEPARATION OF INFORMATION AND CAPITAL

To begin analysing innovation, consider two examples. First, an economist who works at a Boston investment bank received a letter that read: “I know how your bank can make \$10 million. If you give me \$1 million, I will tell you.” The letter concisely illustrates the separation of information about innovation and capital: the bank does not want to pay for information without first determining its worth, and the innovator fears to disclose information to the bank without first getting paid.

Second, a Berkeley mathematician invented bibliographic software and marketed it under the name “Endnote”. In the early stage of developing this product, his hope and fear was to receive a call from Microsoft. The hope was that Microsoft would examine Endnote and decide to buy his company, thus making him rich. The fear was that Microsoft would examine Endnote and decide to build a competing product, thus bankrupting Endnote. Like the Boston bank, Microsoft would not pay for information without determining its worth, and after obtaining the information it would have less need to buy it. (Eventually the Berkeley mathematician got a call from Microsoft, which he answered with trembling, but Microsoft was merely calling to try to sell more software to his company.)

These two examples illustrate the problem of make-or-take applied to innovation. To stimulate innovations, people who make innovations must get paid. To develop innovations into marketable products, innovators must disclose information for investors to evaluate. After the information is revealed to potential investors, however, they may decide not to pay for it.

These two examples concern innovations by an independent person. Alternatively, the innovator may be an employee of a large firm. Financing an

independent innovator and creating incentives for employees to innovate encounter similar problems. To incentivise employees to innovate, the firm must give the innovating employee a secure right to a significant fraction of the value created by the innovation. Drafting an employment contract to achieve this result is difficult. One cause of this difficulty is the complexity of describing and valuing innovations before they occur. Because of practical difficulties, employment contracts seldom guarantee the innovating employee a significant fraction of the innovation's value. Consequently, employees seldom use their full creative powers for the firm, and employees who make discoveries often try to leave the firm and take their innovations with them.

To analyse the separation of information from capital, it is first necessary to explain some principles of the economics of information. Economists make a distinction between two kinds of information: public information and private information. Public information is available to everyone who seeks it. To illustrate, general principles of science are published in books and taught in schools. By contrast, private information is available only to a few people. To illustrate private information, the recipe for Coca Cola is a commercial secret.

When an innovator makes a discovery, he acquires valuable information that is private. Only a few people know the detail of the discovery. Useful information that remains private gives the innovator a competitive advantage against his rivals. This prospect of exceptional profits draws people to use their energy and creativity to innovate. Exceptional profits, however, also attract competitors who try to learn what the innovator knows. As competitors come to understand what the innovator knows, the innovator's private information becomes public. In general, competition converts valuable private information into public information. This is true for recipes, machine designs, computer programmes, organisational methods and market opportunities.

The tendency to convert valuable private information into public information creates a characteristic life cycle of organisations. First, someone innovates and obtains capital to develop the innovation. The innovator may form a new firm and find outside investors, or an established firm with ample capital may employ the innovator. If the innovation succeeds in the market, the innovator's organisation enjoys exceptional profits and expands faster than its competitors. In this stage only a few people understand the innovation. Second, competitors begin to discover what the innovator knows, which erodes the innovator's profits and slows its growth. Third, competitors fully assimilate the innovation, the innovator's profits return to normal, and the organisation

stops expanding faster than its competitors. In this life cycle, the innovator understands the innovation in the first stage, the innovators and some competitors understand it in the second stage, and the public understands it in the third stage.

These three stages in the development of an innovation correspond roughly to three stages of finance for a startup firm in Silicon Valley. According to a popular quip, the initial funding for start-up firms comes from “the three f’s”: family, friends and fools. These “angel investors” rely partly on personal relationships that foster trust between innovator and investor. As a consequence, this paper refers to investment in this first stage as “relational finance”.

Most innovators, however, have too few personal relationships to achieve the scale necessary to finance an innovation’s development. After initial funding by the angels, the second stage of funding comes from “venture capitalists”, who are not family, friends or fools. Venture capitalists are experts at ascertaining risks in the early stages of an innovation’s development. Venture capitalists are also experts at reorganising startups to extract full value from them. Unlike relational finance, venture capital is a form of private finance.

Lawyers in Silicon Valley mediate between innovators and venture capitalists. Besides being intermediaries, some lawyers in Silicon Valley are venture capitalists. To illustrate, the largest Silicon Valley law firm (Wilson, Sonsini, Goodrich and Rosati) routinely accepts payment from startups in the form of preferred shares and deferred debt. Collection of debt is deferred until a “significant capital event” takes place, which normally means an event such as an initial public offering or the acquisition of the startup by an established company. If the startup fails, the shares and debt are worthless, so the law firm gets paid nothing.

In the third stage of the development of an innovation, a successful startup offers its stock to the public. To comply with rules of listing a firm on a stock exchange, such as the New York Stock Exchange or JSE Securities Exchange, a firm that makes an initial public offering must divulge much private information to the public. Thus, the third stage of funding is public finance.

The diffusion of private information to the public corresponds to the fall in expected profits from extraordinary to ordinary, and to the movement in finance from relational to private to public.

CHAPTER 3

POLICY FOR GROWTH?



To foresee the future of science and technology, a person would need to know what has not yet been discovered. Discovery and foresight are substantially inconsistent. Like innovations in science and technology, innovations in markets and business organisation are unforeseeable. Compared to science, business is unforeseeable for an additional reason: strategy. In some simple games like tic-tac-toe, an intelligent person can calculate all the possible moves and counter-moves, and play out the entire contest in his mind. These games have a predictable outcome for intelligent players, which is why intelligent people seldom play them. In other games like poker, calculating all the possible moves is extremely difficult, and the players decrease their predictability by bluffing and randomising their plays. In poker, a player's move is unpredictable before it occurs and understandable afterwards. In this respect, business competition resembles poker. For each move there is a counter-move. The most successful strategy is the one that is hardest to counter, and the hardest move to counter is unforeseen.

Because discovery begins as private information, people with public information cannot foresee which organisations will innovate, become more productive and grow faster than their competitors. Thus, the growth of competing economic organisations is inevitably unpredictable for the public, including most experts and officials of the state. After the cycle of growth is complete and the private information becomes public, the public can understand why the innovator's organisation grew so fast.

In this respect, organisations resemble mutations. Biologists can seldom predict when mutations will occur or how far successful mutants will expand. After expansion stops, however, the biologists can understand what occurred.

To illustrate the point, biological scientists did not predict the appearance and spread of the Severe Acute Respiratory Syndrome (SARS) virus. As the pace of the SARS epidemic slowed, however, scientists increasingly understood its origins and why it spread as it did. Similarly, economists cannot predict which economic organisations will grow in a competitive system, but economists can understand why an economic organisation grew faster than its competitors after the event.

The unpredictability of business innovation has important implications for the laws and policies needed to foster economic growth. In many nations, public officials proclaim the goal of economic growth and manipulate markets to achieve growth. Manipulations involve changes in tax rates, subsidies and tariffs, the conferring of licences and the use of different forms of regulation. These manipulations are called “industrial policy” because state policy guides industrial development. Alternatively, these manipulations are called “technology policy” because state policy guides technological development. With industrial policy and technology policy, state officials choose the business organisations that are promoted through policy interventions, rather than allowing market competition to choose the firms that are more likely to succeed. Officials thus pick the winners and losers among firms and industries.

With some exceptions, public officials have performed dismally in channelling investments to enhance economic growth. To illustrate the case, in the last half of the 20th century many poor countries (and South Africa belongs to this grouping) pursued industrial policies that favoured manufacturing over agriculture, heavy industry over light industry, dirty industry over clean industry, fishing and cutting wood over sustainable production and domestic consumption over exports. Yet, most economists view these policies as mistakes that retarded economic growth.

Industrial policy also performed dismally in wealthy countries. For example, inflation-adjusted oil prices increased sharply from the mid-1970s until 1980, and then fell back to the previous low levels where they remained until turning up again in 2002. In spite of twenty years of price stability, US officials used the fear of rising oil prices to justify direct subsidies for uneconomic extraction of oil from shale by large corporations. Thus, North American oil policy in this period involved a massive waste of US taxpayers’ money for private gain. Predictions of rising oil prices by public officials proved wrong for most of this period, whereas the predictions by private investors in futures markets proved right.

This failure of industrial policy to stimulate economic growth has two causes. The first cause is motivation. The motivation of public officials to make wealth for the nation is weak because they cannot privatise this wealth. Public officials, however, can keep the wealth that they receive in salaries or bribes. By steering industrial development, officials increase their responsibilities and justify higher salaries, and they also increase their opportunities for bribes. Industrial policy is rife with political favouritism, chicanery, cronyism and corruption (witness the South African arms deal). Even so, some people convince themselves that politicians and officials will make more wealth using other people's money than private investors can make using their own money.

The second reason why industrial policy fails to stimulate economic growth is information asymmetry or absence. Even if officials were motivated to make wealth for the nation, they do not have the information needed to guide industrial development. The life cycle of innovation explains their lack of information. In the first phase of the life cycle, innovators discover private information, and it only becomes public at the end of the life cycle when rapid growth ceases. Consequently, the public cannot predict growth rates of competing organisations.

Empirical studies in finance confirm this prediction. Specifically, the evidence gathered by studies in finance demonstrate that investors who possess only public information cannot do better than chance when trying to invest in companies that will grow.¹ The technical name for this proposition is the "efficient market hypothesis". To make the point, most economists are not rich because they study the economy by using public information. As another illustration, many investors mistakenly pay brokers for advice based on public information, which has no value. This realisation has caused dramatic changes in the way many private investors manage their portfolios. "Churning" refers to wasteful and unnecessary trading that generates commissions for investment advisors without increasing profits for investors. Instead of paying investment advisors to pick stocks that outperform the market, private investors who have studied finance tend to favour "passive" mutual funds (or unit trusts as they are called in South Africa), which are investment portfolios whose managers buy a diverse suite of stocks that resembles a market index and then hold the portfolio across time.

By extension, then, just as private investors cannot profit by trading on public information, except by chance, so public officials cannot accelerate

growth by industrial policies – except by chance. Like an investment broker who churns a client’s portfolio, policies that allegedly redirect capital to growth industries mostly waste resources without increasing growth rates of economies. The waste comes from using taxes to pay public officials to perform unproductive activities, and from unproductive expenditures on political influence and bribery. Officials who act on public information do more harm than good when they try to solve the separation of information and capital.

What about acting on private information? Some people, such as investment bankers, have private information and use it to channel investments into organisations that grow quickly. By performing this role, investment bankers increase the rate of the economy’s growth. This begs a question: like investment bankers, should public officials use private information to make economic decisions?

Allowing public officials to invest in particular firms or industries based on private information carries large risks for the nation. Much like diplomatic manoeuvres in foreign affairs, public policies based on private information involve secrecy. Secrecy makes diverting wealth to friends and cronies easier for officials. In contrast, requiring officials to explain and justify their policies by using public information creates a basis for accountability. Public discussion, debate and criticism dampen nepotism, favouritism, cronyism and corruption. The citizens in most democracies, consequently, expect officials to base economic policies on public information.

Based on the above argument, it follows that state officials, like private investors, cannot generally identify growth industries based on public information, and allowing state officials to make economic decisions based on private information invites corruption. In some circumstances, however, public officials have successfully used private information to make investment decisions. For example, there is some evidence to suggest that the best and brightest staff in Korea’s Ministry of Finance and Japan’s Ministry of Trade and Industry (MITI), have been successful in channelling investment capital in those countries into high growth industries. As part of their *esprit de corps*, these officials have a mutual understanding and trust that allows them to share information with each other. In this vein, in the second half of the 20th century, these ministries in Korea and Japan selected industries and firms at which to direct capital and actively manipulated markets. During this period, these two countries enjoyed rapid economic growth. But, as intimated, the case is far from settled.

Perhaps state leadership in development was desirable in Japan immediately after World War II and in Korea immediately after the Korean War. In those times, capital markets were much weaker than today. In addition, the development plans in these countries followed a logical progression that made sense and did not require private information: first, develop relatively basic manufacturing industries (for example, textiles and steel); and, then, proceed to more complex goods (such as cars and electronics goods).

Experts dispute whether state activism caused rapid growth in Korea and Japan, or merely coincided with this rapid growth. By directing investment, MITI may have caused Japanese firms to flourish in the 1950s and 1960s, or MITI may have simply participated in a rapidly rising market without contributing to the rise. To illustrate the latter view, a recent article argues that MITI did not have a political mandate to direct growth in Japan and it never did direct growth (Yishiro and Ramseyer, 2002). According to the authors of this research, the claims to the contrary were often made by self-interested officials and Marxist social scientists who poorly understood markets.² In any case, MITI significantly reduced its intervention and guidance of the economy in the 1980s and since then has not resumed its former role. Perhaps the reasons are the ones suggested by this paper – as the basis of growth shifted from economies of scale to innovation, MITI no longer had information about the best investments for Japanese industry to make.

The experience of the two Chinas also provides support for this theory. Taiwan, which is culturally similar in important ways to Korea and Japan, has no equivalent to Japan's MITI or Korea's Ministry of Finance. With little state leadership, Taiwan has grown faster than Japan and comparably to Korea since 1990. In similar fashion, in the case of mainland China, a centrally planned economy was replaced by a market economy in the 1980s, which triggered rapid and sustained economic growth. With the retreat from state economic leadership, however, China has not yet created an effective formal system of property and contract law.³

¹ According to the efficient market hypothesis, market prices incorporate all public information, so no one investor can do better than chance when relying on public information. This is the "semi-strong" form of the efficient market hypothesis.

- ² In contrast, Aoki (2001) argued that the Japanese state enhanced markets in the first few decades of the post-war period by allowing for “co-operation-contingent rents”. See also, World Bank (1993).
- ³ Elsewhere the idea is discussed how China achieved rapid entrepreneurial innovation without an effective, formal legal system to protect property and contract rights.

CHAPTER 4

WHEN LARGER IS BETTER



I have been discussing innovation, which is the main way to increase productivity. Another way to increase productivity is to increase the scale of production in some firms or industries. Starting with a very small company, the average cost of production usually falls as the size of the company increases. However, before a company becomes competitive, its size must reach a certain minimum level, called the “minimum efficient scale”. The minimum scale for selling fruit from a cart on the street is small, and the minimum scale for refining oil is large. An understanding of this concept is important because, as explained below, development economics has a long history of defending industrial policy based on misplaced arguments about minimum efficient scale.

In some industries, returns to scale continue to increase even after the business is large. In these very special cases, only extremely large businesses can compete. To illustrate, designing large commercial aeroplanes is so expensive that the world probably has room only for a few manufacturers. Noting this fact, the Europe Union created the Airbus consortium to achieve sufficient size to compete with the Boeing Corporation, which is a very large US company. European governments heavily subsidised the creation of Airbus, but once it achieved a prominent position in world markets, the consortium was privatised and the subsidies were allegedly removed. (Airbus and Boeing often trade accusations that governments clandestinely subsidise the other firm in violation of the World Trade Organisation’s rules.) In the case of Airbus, private capital markets allegedly did not have enough funds to finance the company at the scale needed for profitability, so European states provided the capital.

Was the European Union prudent to use state funds to create Airbus? Commentators disagree. Perhaps Airbus is one of those exceptional cases of a good investment that is too large for the private market to finance. Or perhaps Airbus is an uneconomic folly, like the super-sonic aeroplane named “Concorde”. Concorde, whose commercial service began in 1976 and effectively ended with a deadly crash in Paris in 2000, set speed records for commercial aircraft, but never came close to recouping the massive investments by the governments of Great Britain and France. Thus, a question mark hangs over the efficacy of these governments’ decision to fund the investment in Concorde.

In any event, the argument for state subsidies of Airbus is the same one that development economists used to justify state-led growth in developing countries. The basic idea is that private companies in rich countries already exceed the minimum size for profitability, whereas business organisations in poor countries remain below the minimum size for profitability. According to this theory, unprofitable companies and industries in developing countries could turn profitable if they are increased sufficiently in size. Private capital markets in poor countries, according to this theory, lack funds to finance the growth of business organisations to the point where they become profitable. Consequently, the state should provide subsidies and tariff protection until these companies reach the minimum efficient scale to compete with large firms in rich countries.

In this vein, state assistance to firms and industries is organised through public law, where the “public law approach” to economic development gives central place to administrative and regulatory law. Whereas private law provides a framework for competition among businesses to determine the path of economic growth, the public law approach allows state officials to direct the economy.

But this public law approach and the dominant tradition in development economics should be rejected for two reasons. First, under contemporary conditions investment banks rarely encounter profitable opportunities that are too large for private finance. Cases like the Concorde are rare exceptions, not the typical situation of companies and industries in poor countries. The argument that subsidies to companies and industries will cause them to grow up enough to turn profitable seems no more true in poor countries than in rich countries. Instead of growing infant industries to efficient scale, governments more often

undertake massive public investments, like Concorde, that prove to be unprofitable. In this fashion, public officials in many developing countries have channelled state subsidies to preferred industries that have performed dismally. The legacy of state-led growth in many countries includes “industrial dinosaurs” that are very large and cannot survive competition.

Second, economic growth in developing countries mostly occurs through entrepreneurial innovation. Unlike economies of scale, entrepreneurial innovation especially relies on relational and private investing. To avoid the corruption that is endemic in poor countries, the law should prohibit the public from investing state funds based on relationships or private information. Instead of promoting growth, the public law approach to development is detrimental to entrepreneurial innovation.

State officials, however, have a central role in identifying necessary investments of another kind. Industry needs infrastructure such as roads, water, electricity, airports, harbours, telecommunications and industrial parks. Developing infrastructure often requires assembling large tracts of land, which often encounters the obstacle of fragmented private ownership. To make the point, a proposed road may pass across land owned by many different people. Voluntary purchase of land to construct the road encounters a fatal problem: owners who holdout by refusing to sell their land can hold up the project and command a higher price. To avoid holdouts, most legal systems allow the state to compel owners of land to sell it. Unlike the state, many legal systems do not allow private persons to compel owners of land to sell it. Thus, when a development requires eminent domain, the state must take the lead. Because many infrastructure projects require the power of eminent domain, state officials have a central role in many infrastructure projects. By contrast, some forms of infrastructure, such as cell phone networks, do not require the power of eminent domain and do not need state leadership.

Above, innovation, economies of scale and infrastructure are contrasted. Public officials should avoid direct investment in innovation because it relies too heavily on relationships and private information that are inappropriate for public policies. Instead of directing innovation, the state should provide a framework for innovation which consists in law and infrastructure. By contrast, using public information, public officials can invest directly in very large scale economies, but these cases are extremely large. Also, the state should lead infrastructure developments whenever the power of eminent domain is needed

to overcome fragmented ownership, which is common. These infrastructure developments should be based on public information.

I Law for Growth

In rich and poor countries, industrial or technology policy cannot increase the pace of economic growth except by chance. Consequently, the state stimulates innovation and growth indirectly. The state's indirect role consists primarily in supplying infrastructure and a good legal framework. Having discussed infrastructure briefly, the discussion returns to the central problem of the legal framework for innovation: separation of innovation from capital.

Financing innovation requires some degree of trust between innovator and investor. Trust is required because each party takes risks that the material self-interest of the parties imperfectly secures. By increasing trust between innovator and investor or, equivalently, by making trust less necessary, law extends capital markets from relational finance to private finance, and from private finance to public finance. This movement increases the pace of economic development by increasing the flow of capital to innovators.

Property and contracts are the legal foundations of economic co-operation, including co-operation between innovator and investor. I use the phrase, "the Property Principle," to refer to the proposition, "People who create wealth can keep most of it".¹ When implemented, the property principle motivates people to make wealth rather than to take it. Legal institutions must protect the creators of wealth from predation by private persons such as criminal gangs, scheming managers, dishonest accountants, appropriating bankers and corrupt unions. In addition, the legal framework must protect wealth creators from predation by public officials such as tax collectors, planners, licensing authorities, regulators and politicians.

A person who foresees that thieves will probably steal everything has little incentive to produce anything. Ineffective protection of property rights has devastating economic effects in the poorest nations. Instead of making wealth, people impoverish the nation by competing to take wealth from each other. To illustrate the argument, producing and transporting diamonds in central Africa today approaches the level of anarchy, so central Africa produces few diamonds and receives much less than the world price for them. (Nothing is said here about the heinous abuse of human rights.) If anarchy were re-

placed by a secure system of property rights, central African nations could produce diamonds with better technology, export them through the regular channels of world trade and receive the world price.

Unlike diamond thieves, Moscow criminals who sell security do not want to take everything from their clients. In order to sell protection, there must be something to protect. Moscow criminals try to impose a “security tax” that still leaves room for the shopkeeper to prosper. The contrast between central African diamonds and Moscow security illustrates that private security is better than anarchy. But neither of these outcomes is as good for economic welfare as effective public laws.

Besides motivation, making wealth requires co-ordinating the efforts of different people through organisations and markets. People co-ordinate especially by saying what they will do and doing what they say. According to the contract principle, a person can voluntarily assume legal liability for failing to do what he says he will do. Legal liability helps people to rely on the word of others, including people who are not friends or relatives. When people can rely on the word of others, they can extend their sphere of co-operation in time and space.

Conversely, ineffective enforcement of law in poor countries narrows the sphere of co-operation in time and space. Weak contract law impoverishes nations by keeping trade too local and keeping organisations insufficiently specialised. For example, some businesses in Jakarta make cloth from cotton and sew it into clothing within a single factory. Gathering everyone into a single factory enables its owner and his relatives to monitor everyone else’s work. Better contract law would enable the factory owner to specialise in the activities that he does best and contract out the remaining activities. An enforceable contract can lower the cost of monitoring, which disperses production and widens markets.

Property and contract law-on-the-books in a poor country often closely resembles a rich country. For example, property and contract law in India and Nigeria resemble English common law, and property and contract law in South American countries resembles the French and Spanish civil codes. Just as most property and contract law on-the-books is sound in rich countries, so most property and contract law-on-the-books is sound in many developing countries. Unfortunately, property and contract law-on-books in poor countries also tends to be ineffective. By “ineffective” it is meant that property rights are

violated and contracts are broken without victims having access to effective remedies. Effective remedies consist in legal or non-legal sanctions that deter wrongdoing and compensate victims. It is arguable that the most pervasive and fundamental defect in the legal framework of poor countries is inadequate enforcement of property and contract law.

To illustrate, Mexican courts assess interest against delays in collecting a debt at rates below the market rate of interest. Consequently, debtors gain by using the law to delay repayment. One of Mexico's richest businessmen, Ricardo Salinas, began to build his fortune by figuring out how to avoid courts and still collect debts from poor people who buy consumer durables. (His debt collectors keep the names of each borrower's relatives and enlist their help in collecting the debt.) The situation is worse in India where collecting a debt through the courts takes years or even decades. In some countries, the judges regularly take bribes to decide a case. In Indonesia, instead of trying cases, the country's lower courts "auction" them.

As another example of the causes of ineffective private law, many countries have constitutions that guarantee a citizen's right to a trial. In Chile and some other Latin American countries, this right is interpreted to mean that the court should not assess fees against the parties to a legal dispute. The absence of fees increases the quantity of cases. Heavy case loads cause judges to dispose of most cases on the basis of written documents, without oral arguments in court.

Neutral judges resolve disputes based on law and facts, whereas biased judges resolve disputes on unfair grounds, including personal relationships. To promote neutrality, many legal systems forbid the parties in a dispute to communicate with the judge outside the courtroom. For example, an attorney is forbidden to have dinner with the judge who is deciding his case. The rule against "*ex parte* communication" assures that each party can hear all of the other side's arguments in court and reply to them. Many poor countries have no rule against *ex parte* communication. For instance, in Argentina the lawyers for the two parties routinely speak to the judge about a case outside of court proceedings, which undermines the judge's neutrality. Doubt about the judge's neutrality creates uncertainty about property and contract rights that burdens business activity.

Having considered property and contract law-in-practice, now I turn to the specialised laws that businesses need, which are often built on property

and contracts. The discussion begins with corporate law. An investor who does not control a company runs the risk that the people who control it will expropriate his investment. Securing non-controlling investors against expropriation requires effective corporate laws. Effective protection for stockholders is harder than for bondholders. Stocks entitle their holders to a share of profits. The people who control a company can manipulate reported profits in ways that are difficult to detect and prove in court. The stock market cannot flourish in most poor countries because ineffective corporate and securities laws provide insufficient protection against manipulation of non-controlling investors. In contrast to stocks, bonds prescribe an exact repayment schedule that the issuer must meet or go bankrupt. The repayment obligation for bonds is easier for courts to enforce than the dividend sharing obligations for stocks. Consequently, finance in developing countries is skewed towards bonds rather than stocks. As a case in point, Ecuadorian investors in a recent year bought 150 times more bonds than stocks.

This pattern of finance creates problems for new businesses. Like biological mutations, most new businesses fail and a few succeed spectacularly. Attracting capital to startup businesses requires offsetting the high probability of failure by guaranteeing the investors a substantial fraction of the possible gains. Skewing finance towards bonds and away from stock deprives investors of the possible gains, which makes them less likely to invest. Also, when entrepreneurs must borrow at fixed interest rates rather than borrowing against a share of future profits, their risk is greater. To illustrate, an entrepreneur who uses his money to start a company and then obtains additional funds by selling bonds runs the risk of losing everything if the company fails. A larger stock market that permitted businessmen to sell more stocks and fewer bonds would encourage entrepreneurs by allowing them to spread their risk. The skew in financing away from stocks dampens investment in startups and slows the pace of innovation.

In many poor communities, land is the most valuable asset. To borrow money and fund new businesses, entrepreneurs want to mortgage land. To mortgage land, the lender must have the legal power to seize land from a defaulting debtor and sell it to satisfy the debt. Legal obstacles that prevent lenders such as banks from repossessing land also prevent entrepreneurs from financing businesses by using land to secure loans. For instance, Indians on the Navajo Reservations in the western US often live in trailers rather than houses.

The advantage of trailers over houses is that lenders can repossess trailers and tow them away, whereas the Navajo courts will not allow outsiders to seize the house of a defaulting debtor. On places like the Navajo Reservations, solving this problem involves developing new law, not just enforcing existing law. Developing new law is tricky in this case, because the transfer of Navajo land to outsiders would quickly erode the social basis for the existence of the Navajo nation.

As explained, defects in property and contract law cause people to take wealth from each other, as illustrated by African diamonds and Moscow security. Similarly, state officials use public law to take wealth from its creators and keep it for themselves or give it to politically favoured people. Unlike property and contract law, the defect is not just under-enforcement. In addition, the defect in poor countries lies in law-on-the-books.

Two kinds of defects in public law produce bad results. First, public law creates monopoly power as a way to transfer wealth from ordinary people to the friends of politicians. To illustrate, many developing countries have state agencies with monopoly power over the purchase and export of goods produced in the countryside. In principle these agencies smooth fluctuations in world commodity prices. In practice these agencies force rural producers to sell below the world price. Thus Papua New Guinea has a coffee marketing board with the exclusive right to buy coffee beans from farmers. Licences and regulations are two other techniques for the state to create monopoly power. When a business needs a compulsory licence to operate, denials of licence applications restrict the entry of competitors and create monopoly profits for licensed businesses. Regulations can have the same consequences as licences. When a business must conform to a regulation to operate, regulations can be designed and administered to restrict entry of competitors.

In the 1960s, British Railway workers sometimes paralysed the system while stopping short of a strike by following every rule. Besides creating monopoly, the second defect of public laws-on-the-books is excessive regulation. Like “work-to-rule”, officials who enforce excessive regulations choke markets. To keep markets operating, entrepreneurs often have to bribe officials. Officials may burden markets by enforcing excessive regulations or accept bribes to circumvent the rules, but either way the nation loses.

As evidence of this point, environmental regulations in the Lacandon Forest of southern Mexico are more effective at generating bribes for environ-

mental officials than at slowing the destruction of the forest. The main effect of these environmental regulations is allegedly to create a new source of bribes for the officials who do not enforce them, and to increase the cost of lumbering by an amount equal to the cost of bribing officials.

Monopoly-creation and over-regulation often go together. For instance, a licence may create monopoly profits for the licensee, who can use the monopoly profits to pay bribes or make political donations to the officials who grant licences. Following the research of Hernando De Soto (1989), researchers have documented the heavy regulatory burden to create a new company or enter a new line of business in poor countries.

While governments in poor countries over-regulate in many areas, public law is under-developed and under-enforced in other areas. For example, fish are harvested on Philippine reefs by spreading cyanide over the water. Cyanide stuns the fish for collection, then sinks to the bottom and kills most other living things. The Philippine Reef and the Lacandon Forest are just two examples where rapacious people plunder natural resources because environmental laws are ineffective. This behaviour is rational for some individuals and irrational for society. To illustrate, over-fishing is so severe in every major fishery in the world that the catch of fish would increase if less labour and capital were spent on fishing. Modern commercial fishing is analogous to a factory with so many workers crowded into it that reducing the number of workers would increase total output.

II Intellectual Property Deficit

Having explained some defects in the legal framework for innovation in poor countries – ineffective law of property, contracts, and business and over-regulation by public law – the discussion turns to the role of intellectual property in economic development. In order to analyse the law of intellectual property, two different kinds of information are examined. “Explicit information” refers to information that is easily reduced to a statement or formula that can be transmitted at low cost from one person to another. Explicit information especially involves science and technology, such as engineering plans, chemical processes and computer programmes. This is distinct from “implicit information”, which refers to something that a person knows and cannot easily explain to others in a way that they can understand. To illustrate, a person may not be

able to explain fully his hunch about an investment opportunity. Or a person may be unable to explain his intuition about the reliability of a promise. Or the individual members of a firm may be unable to explain fully how the firm as a whole solves certain problems. Hunches, intuitions and imbedded knowledge are forms of implicit information. Entrepreneurs tend to rely on them when developing new organisations or markets.

Technological innovation is often explicit, and entrepreneurial innovation is often implicit. Economically successful innovations often combine technology and entrepreneurship. To demonstrate this point, the inventor of a new machine may reduce the discovery to a patent that engineers can understand, and the inventor may struggle to convince investors that buyers will want the new product made by the new machine.

Law protects property owners by awarding damages for past harm and injunctions against future trespass. To gain this protection, a property right must be definite enough to verify harm and trespass. Explicit information is often precise enough for this purpose. Consequently, the law of intellectual property, whose two primary branches are patents and copyright, protects many technological innovations.

For explicit innovations, the innovator is afraid to tell investors about his discovery for fear that they will steal it. The innovator must trust the investor enough to disclose explicit information to him before getting full payment. Intellectual property rights in technology help to secure this trust. Consequently, the law of intellectual property is important for technological innovation.

Whereas innovators must guard against theft of explicit information, they must struggle to make implicit information understood. For implicit information, the investor must trust the innovator enough to give him money before fully understanding the innovation. To illustrate, an insurance company may be unable to convince outside investors that it has found a better way to organise its sales force.

Like all property rights, patent and copyright are only as good as the owner's ability to enforce them. Intellectual property rights are harder to enforce than, say, real property rights. This point is illustrated by the fact that Americans steal much more software than real estate. Inefficiencies in courts and police that cause imperfections in protecting intellectual property in the US are magnified in most poor countries, where intellectual property protection is weak.

Implicit information is usually too imprecise for anyone to own, so the law of intellectual property seldom protects implicit information. To illustrate, recent attempts to extend US patents to “business processes” have little success and strong critics. Thus, to reuse an earlier example, an insurance company cannot patent a new way to organise its sales force. The law of intellectual property, consequently, is not so important for entrepreneurial innovations. (Where intellectual property law fails, the law of trade secrets sometimes succeeds.)

As mentioned, explicit information especially refers to science and technology, which educated people produce in laboratories and universities. Rich countries have relatively more educated people, well-equipped laboratories, and superior universities. Consequently, explicit innovations especially occur in rich countries. For this reason, the law of patents, copyright, and trade secrets is more important for economic growth in rich countries than in poor countries. In some cases, poor countries will do better by taking explicit innovations from rich countries instead of making them.² For example, many Latin American countries have historically refused to recognise pharmaceutical patents. The citizens of these countries, consequently, have enjoyed cheap generic medical drugs. Similarly, China has historically not suppressed pirated software, so Chinese citizens have enjoyed cheap copies of computer programmes from abroad.

These practices, however, increasingly risk violating international agreements and provoking retaliation. In effect, rich countries have lowered tariffs against imports from poor countries in exchange for poor countries agreeing to protect the intellectual property of citizens in rich countries.³ When poor countries fail to protect intellectual property, the rich countries can retaliate by curtailing imports. Also, when poor countries fail to protect intellectual property rights, some domestic production in poor countries suffers. As evidence of this, circulation of illegally copied movies in China harms Chinese moviemakers, not just Hollywood.⁴ For these reasons, the advantage to poor countries of not protecting intellectual property may shrink or disappear.

Turning from explicit information to consider implicit information, when competing in world markets, countries tend to specialise in those goods that they can produce more cheaply than other countries. Comparative advantage in costs especially comes from using cheap factors intensively in production. The factor of production that poor countries have in abundance is cheap la-

bour. The challenge is to fit low wage workers into organisations that release their productivity. Meeting the challenge is not so much a problem of obtaining technology as using it. Learning to use technology involves co-operating in new ways through innovations in organisations and markets.

To illustrate, a worker who emigrates from a poor country and finds a job in a rich country enjoys a sharp increase in wages, which reflects his sudden increase in productivity. The immigrant's productivity increases sharply because his labour is embedded in a better organisation with better technology. To increase worker productivity without immigrating, the poor country must improve its organisation and marketing. For example, in 1942 four friends in India formed Asian Paints. Over the course of 25 years, Asian Paints became India's largest paint company and it now ranks among the top ten decorative coatings companies in the world by sales. The founders of the company had to create an effective organisation to take advantage of India's relatively low wage rates. Indian scientists and foreign companies provided the technology, but not the organisation, which Indian entrepreneurs provided.

Under modern conditions, good organisations can obtain technology. The greater problem for poor countries is to develop good organisation. That is why the problem of innovation in poor countries is less technological and more entrepreneurial. Entrepreneurial innovation, which refers to innovations in organisations and markets, is the most crucial form of innovation for economic growth in poor countries. Entrepreneurial innovation mostly involves implicit information. Unlike explicit information, implicit information is relatively hard to transmit, so it tends to remain within the innovator's organisation for some time. To reward entrepreneurs for implicit innovation, law primarily needs to secure the rights of each organisation to the value that it produces. This is a problem of enforcing material property rights, not the much harder problem of enforcing intellectual property rights. To promote entrepreneurial innovation, poor countries need not extend intellectual property law to cover innovations in business organisation. In the US, patents have been extended to some types of innovations in business organisation, and many economists regard granting these "business process patents" as an unfortunate mistake in US patent policy.

III Conclusion

Economic innovation occurs when someone discovers a better way to make things or better things to make. Only a few people initially know about an innovation. Implementing an innovation requires combining private information with capital, which poses an inherent problem of trust between innovator and financier. Because officials should act on public information, industrial policy cannot help to solve the problem. Instead, industrial policy is the state's equivalent of churning a private portfolio.

Law helps to solve this problem by providing a framework for commitment and co-ordination built on an account of human nature. Economic rivalries among people are intense. Rivalries directed towards making wealth enrich the nation, and rivalries directed towards taking wealth impoverish it. Two fundamental principles direct rivalries towards making wealth. The property principle asserts that people who make wealth can keep most of it. When private or public predators violate this principle, rivals are deflected from making wealth to taking it. The contract principle enables people to commit to doing what they say, so they can co-ordinate their behaviour. When people can co-ordinate their behaviour, they can achieve efficient scale in organisations and markets.

Responding to these facts, rich countries rely mostly on the private sector as the engine of growth, with the public sector providing a framework of law and public goods. The best course for poor countries is to do the same. Unfortunately, many theories of economic development regarded poor countries as exceptions that require more state leadership and regulation. State-led growth causes industrial policy and administrative law to crowd out the law of property and contracts. In the 18th century, Adam Smith caused an intellectual revolution by demonstrating that monopolies created by the state, including those created indirectly through licences and regulations, cost the public far more than the profits enjoyed by the beneficiaries. Adam Smith's critique of the mercantilists in his day applies to much of development economics today.

All nations now have the opportunity to escape poverty by developing productive organisations. A good legal framework causes productive organisations to develop naturally from competition among people. Most poor countries have good property and contract laws on the books, but these laws are ineffective. Ineffective property and contract law is the worst defect in the law

of poor countries. Legal reform must aim to increase the effectiveness of private law and reduce regulations in public law.

Moral principles about stealing and lying are abstract and vague, so their application to business is often indeterminate. Business law remedies the problem by stipulating good practices in detail. The best business law identifies the best business practices and raises them to the level of legal obligations. For example, some ways to organise a company are better than others, and good corporate law enforces the practices of good companies. To illustrate historically, Judge Mansfield modernised the English law of financial instruments in the 18th century by understanding the best practices that merchant banks actually followed, then raising these practices to the level of the common law. Similarly, Karl Llewellyn followed the same philosophy as Mansfield when he organised the Uniform Commercial Code project, which produced the most important business law in 20th century America.

To refer to this process of raising the best business practices to the level of law, I use the term “market modernisation”. Market modernisation requires business law’s development to follow innovations in markets and organisation. Innovation often occurs faster when the market leads and the law follows for two reasons. First, the trajectory of entrepreneurial innovation is unpredictable from public information. The best business practices tend to evolve in ways that judges and lawyers cannot predict. Since the information known by legal officials lags behind innovations in business practice, innovation occurs faster when market practice leads and the law adapts to it. Second, learning about changes in law imposes heavy transaction costs on businesses. Businessmen do not have time to become lawyers, so they mostly take morality and business norms as their guide for what the law requires. As long as they conform to morality and accepted business practice, they hope to remain within the law. When they want to engage in a sharp practice that violates morality or accepted business practice, they consult a lawyer. However, if law departs from morality and business practice, businessmen must constantly consult lawyers when developing business strategy. When the law follows business norms, businesses proceed with relatively low transaction costs, and when the law departs from business norms, the transaction costs of business increase sharply.

- ¹ The property principle assumes that we can decide who made what. This is not so easy when people make things by co-operating and combining their resources. Later it is explained why this objection is more philosophical than practical.
- ² For the argument that developing countries should not have intellectual property laws, see Pasquel (2004).
- ³ Here the argument especially refers to the fact that poor countries seeking lower tariffs by admission to the World Trade Organisation (WTO) must accede to the World Intellectual Property Organisation's (WIPO) restrictions.
- ⁴ The following newspaper headline illustrates the extent of this practice: "42 Million Pirated Discs Destroyed in Latest Chinese Anti-Counterfeiting Effort." *San Francisco Chronicle*, August 12, 2003.

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