ECN330 Module 5 SRP. Services Trade and Rules on Intellectual Property

Services Markets and the Economics of Services

Prior to the UR-GATT negotiations, the economic analysis of liberalization of trade or market integration in services had long been neglected in economics textbooks and the academic literature. There are three reasons why this is no longer justified, if ever it was [1]. First, services represent the fastest growing sector of domestic economies and of the global economy, in absolute and relative terms (i.e., compared with agriculture and manufacturing combined). The overall sector is important in terms of output (two-thirds of global output) and employment. Second, services account for nearly 20% of global trade and in value-added terms for approximately 50% of world trade. Finally, the advancement of economic integration in Europe in the 1980s had exposed the near total absence of progress in services market integration [1][2].

When the idea of bringing rules on services into the multilateral trading system was floated in the early to mid-1980s, a number of countries were sceptical. The agreement that was developed, however, allows a high degree of flexibility, both within the framework of rules and also in terms of the market access commitments [2].

The Economics of Services Trade

Regulation is economically justified by three market failures: internalities such as asymmetric information; market power or imperfect competition; and externalities. All three play an important role in services, although sectoral specificities in the provision and trade in services need to be considered [2].

The most general market failure in services is *internalities*. This is caused by the fact that services, unlike goods, are non-storable or intangible. This intangible nature makes it even more difficult to assess quality than with products, indeed, it is impossible to do it prior to consumption. Services being 'experience goods' rather than 'search goods', imply that markets are expected to suffer from asymmetries of information. Usually, this means that the seller knows more *a priori* about service quality than the buyer, although quality may sometimes depend on interaction between buyers and sellers (e.g., education, consultancy) and occasionally buyers may cause information problems for sellers (e.g., insurance) [2].

There are basically two problems to be overcome for services markets to function properly in this respect: moral hazard and adverse selection. *Moral hazard* refers to market behaviour induced by imperfectly observable information: thus, suppliers can make higher profits by reducing the actual quality of the service below the perceived or expected quality. The problem is acute for non-repeat purchases in the absence of any controlling knowledge (e.g., a taxi ride for a tourist). The market solution for moral hazard is to signal commitment to quality by means of investing in reputation, brand names and easy access to complaint procedures. However, since these solutions are not watertight (especially for high risks such as some insurance or medical services) and, in any case, are based on repeat purchases and comparability, some regulation may be justified. Services are extremely differentiated products. Only comparable services can benefit from reputation effects by word of mouth [2].

Adverse selection, caused by asymmetric information, is more evenly a problem of both buyers and sellers. Sometimes sellers may not have (or ask for) enough information about buyers so as to distinguish them according to risk (hence, pricing, including risk premiums, is problematic). In other cases, buyers may be confronted with many services suppliers but have no way of distinguishing their (divergent) qualities or competence. Market solutions for adverse selection may include self-regulation of (minimum) professional qualities, self-regulation of conduct or standard contracts agreed between, say, consumers bodies and suppliers associations. Such solutions decrease the uncertainty for the buyers due to minimum standards of quality; hence, confidence may be increased [2].

However, self-regulation might only come about when (a credible threat of) regulation exists, otherwise free-riding among suppliers may prevent agreement. The reason is obvious: higher competence and quality services would tend to be driven out of the market as both their prices and frequency of sales would be continuously undermined by charlatans exploiting lack of information on the part of the buyers. Apart from the rationale for 'back-up' regulation, societies have judged the risks to individuals, the impact on individual household expenditure and the smooth functioning of services markets, so important that all kinds of structure and conduct regulation (including licensing and supervision by special agencies) have been introduced. Sometimes sellers are allowed to refuse buyers if insufficient information is supplied. All this regulation might be wholly or partly justified [2].

The second market failure is imperfect competition. Sellers of many services tend to enjoy some degree of market power. The latter results from a low degree of contestability of the established firms in the market. This may depend on economies of scale or scope (for multi-services supply) or on product differentiation. But the observation of any of those three is not a sufficient condition. What matters is whether new entrants can enter and exit at low enough cost (and at high speed) that potential competition becomes a credible discipline on the behaviour of established firms. Given such entry and exit conditions, and given that market power is exploited, 'fly-by-night' companies might enter at virtually no-costs, and erode the profitability of established firms. If the entry costs are determined by the exit costs and are low (that is, if there are well-functioning markets for buildings and equipment so that entry costs can be recouped upon exit), and cost functions of established companies are similar to those of new entrants, then contestability is high and market power cannot be exercised [2].

Among services, contestability varies enormously between sectors. At one extreme of the spectrum, scale and /or scope are absent, while at the other extreme, barriers to entry and exit are high. The latter means that costs incurred with entry cannot be recouped upon exit: they are sunk. Thus, one could hardly imagine a well-functioning market to exist for a railway network or a telecom cable network; however, for aeroplanes, second-hand markets have emerged. So, one has to assess tangible exit barriers from case to case. Intangible entry/exit barriers may be more important in services, however. Especially, investment in reputation and consumer loyalty is specific to the company and hence sunk. The costs to acquire reputation and loyalty can be extremely high and may serve as very effective barriers to entry, alone or even more so in combination with network externalities (e.g., airlines; retail banking) [2].

Of course, internalities and market power may mutually reinforce each other. Thus, consumer loyalty may be due to consumer switching costs, which consumers may perceive to be high between experienced services (from the supplier they are loyal to) and inexperienced ones, the quality of which they cannot judge. It is claimed that this explains consumer loyalty in retail banking. This makes contestability by new entrants very difficult (because discounting may be distrusted as low quality) and hence may lead to concerted or parallel pricing behaviour in an

oligopoly of the established companies. Another example of interaction between the two market failures is self-regulation which, in addressing the problem of asymmetric information, may actually raise barriers of entry (too much) or stifle innovative conduct. This is often said to be the case for certain professionals, for example, notaries [2].

How regulating services can blunt competition

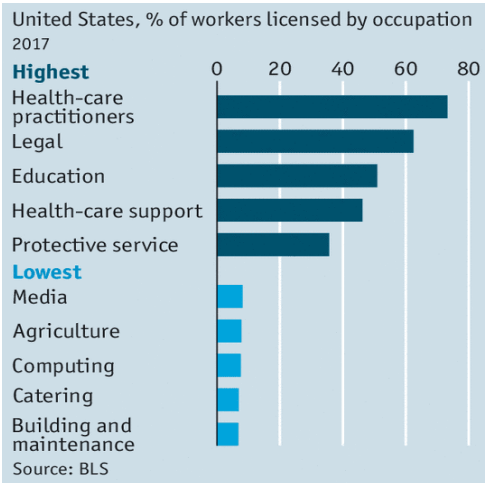
Occupational licensing—the practice of regulating who can do what jobs—has been on the rise for decades. In 1950 one in 20 employed Americans required a licence to work. By 2017 that had risen to more than one in five. The trend partly reflects an economic shift towards service industries, in which licences are more common. But it has also been driven by a growing number of professions successfully lobbying state governments to make it harder to enter their industries. Most studies find that licensing requirements raise wages in a profession by around 10%, probably by making it harder for competitors to set up shop.

Lobbyists justify licences by claiming consumers need protection from unqualified providers. In many cases this is obviously a charade. In 41 US states makeup artists require licenses, as if wielding concealer requires government oversight. Thirteen license bartending; in nine, those who wish to pull pints must first pass an exam. Such examples are popular among critics of licensing because the threat from unlicensed staff in low-skilled jobs seems paltry. Yet they are not representative of the broader harm done by licensing, which affects crowds of more highly educated workers. Among those with only a high-school education, 13% are licensed. The figure for those with postgraduate degrees is 45%.

More educated workers reap bigger wage gains from licensing. Writing in the *Journal of Regulatory Economics* in 2017, Morris Kleiner of the University of Minnesota and Evgeny Vorotnikov of Fannie Mae, a government housing agency, found that licensing was associated with wages only 4-5% higher among the lowest earning 30% of workers. Among the highest 30% of earners, the licensing wage boost was 10-24% (see chart, wage boost). Forthcoming research by Mr Kleiner and Evan Soltas, a graduate student at Oxford University, uses different methods and finds no wage boost at the bottom end of the income spectrum, but a substantial boost for higher earners.

One way of telling that many licences are superfluous is the sheer variance in the law across states. About 1,100 occupations are regulated in at least one state, but fewer than 60 are regulated in all 50, according to a report from 2015 by Barack Obama's White House. Yet a handful of high-earning professions are regulated everywhere. In particular, licences are more common in legal and health-care occupations than in any other (see chart, workers licensed by occupation).

These professions share two characteristics. First, it takes years of study—and often lots of student debt—to join them. Becoming a doctor takes a four-year undergraduate degree, a four-year postgraduate degree, and then a multi-year medical residency. Those barriers to entry mean that once the law requires the involvement of a doctor, costs soar. Yet it surely does not take all that training, argue nurse practitioners, to know when to prescribe diabetic shoes. The evidence is on their side. A review of the literature in 2012, paid for by the federal government, found that no study raised concerns about the quality of care offered by nurse practitioners. There are plenty of comparison points, because 22 states have overcome doctors' objections and given nurse practitioners so-called "full practice authority".



Second, it is often practitioners themselves who define—and expand—the boundaries of the regulated profession. For example, in North Carolina a board of dentistry, mainly elected by dentists themselves, regulates the profession. In 2006 it tried to stop hygienists and beauticians from whitening customers' teeth, after dentists complained that they were being undercut on price. (The Federal Trade Commission (FTC) objected, and in 2015 the Supreme Court put a stop to the practice by ruling that the board was not exempt from competition law.)

Economist, "Regulation: How to rig an economy", 17 Feb 2018, p. 37-8.

It goes without saying that these features require application of a sophisticated and active competition policy to services. Unfortunately, asymmetric information (as well as the third market failure) has often prompted regulation which reduces the scope or effectiveness of competition policy. Carefully assessing the complementarity between regulation and competition policy is absolutely critical for the understanding of the establishment and proper functioning of the internal market for services [2].

The third market failure is *externalities*. Where these are negative externalities (e.g., for the environment) they may give rise to regulation. More complicated are the positive externalities in goods and services networks (e.g., telecoms, rail, postal, gas/electricity; to some extent airlines). Economies of scale are such that 'natural monopoly' may be justified on efficiency grounds. More precisely, these effects may play a role on the supply and demand sides. In some utilities supply scale effects may not be exhausted until a single national network is formed, for example, in rail, gas electricity, and up to the 1980s, a fixed-wire telecom network. On the demand side, the term used in economic theory is 'network externalities': existing subscribers to a telephone or fax network benefit from every new subscriber, which in turn attracts more new subscribers. In airlines, network externalities result from economies of scope in

scheduled (not charter) traffic, as many city-pair services are offered with smooth (and cheaper) connections within one network. The typical US response up to the early 1970s was to regulate natural monopolies or network services strictly. In Europe responses varied but often regulation, based on exclusive rights, were combined with public ownership, often supplemented by loss-covering subsidies [2].

There are two reasons behind such far-reaching interventions. First, a natural monopoly's market power is so large, potentially, that it was thought to be superior to resort to non-market means so as to control quality and price as well as other conduct. Second, societies perceived precisely these services as 'basic' to both the economy's infrastructure and citizens' socio-economic rights [2].

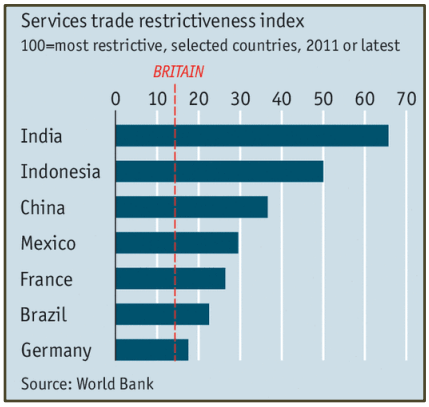
Network externalities can be very strong but these benefits may be offset by high costs on the periphery of the network. A well-developed network would therefore be expected to exhibit sharply different prices. If this would lead to too little demand, the network would simply not be fully developed. That is why service and goods utilities were given exclusive rights: equality of service everywhere in the (fully developed) network at affordable prices, was 'bought' at the costs of no entry. The combination of this universal service with monopoly in turn requires regulation forcing the monopolist to reduce prices below costs in the periphery. The cross-subsidisation between trunk sections and periphery requires no entry: otherwise new entrants would undercut the high price/cost margins on profitable trunk connections of the network, leaving peripheral deliveries unattended or subject to extremely high prices. Such 'cream-skimming' behaviour by entrants would prompt competitive reactions by the incumbent, and in the end the universal service would become unsustainable [2].

Since the 1970s, however, technological change in some services as well as the appalling price/quality ratios of utilities almost everywhere have led to a questioning of existing regulation. For instance, what is the proper economic underpinning of 'natural monopoly' and what part, if any, can be subjected to competition? It also led to a greater acceptance of market processes, since the imperfections of the regulatory and public ownership approach were seen as intolerable. In turn, this prompted a debate in Europe about 'universal service' in a more competitive environment of utilities [2].

Services trade in practice

Since the UK began discussing Brexit, it had identified negotiating its own trade deals. But even going it alone (without the EU) still implies that trade deals involve some awkward trade-offs. For example, Australia and New Zealand were quick to express interest in striking trade deals with the UK. As big agricultural exporters, Britain's farmers would come under competitive threat. However, the point of making such concessions would be for Britain to gain access to foreign markets in things that it excels at selling. Services, particularly banking and related professions such as accountancy, are among the exports that Britain is keenest to tout [40].

Britain might want to target countries with growing middle classes and still-weak services sectors, such as India and China, as well as Indonesia. In many countries, however, services are among the most protected industries. Often this is for political reasons as well as regulatory ones. Analysis by the World Bank shows that even within the EU, many countries are more closed than Britain. The likes of India would be hard to crack (see chart, XXX), and offering access to Britain's agricultural market may not help as it is relatively small [40].



Modes and incentives of services trade

Services differ from goods: production and consumption occur at the same time. Often it may also happen at the same location, although new technologies may make this characteristic more and more service-specific (Sampson & Snape, 1985). For these two reasons four modes of international services transactions are distinguished, which are now also recognized in the GATT/WTO:

Type 1 Cross-border. Immobile users in country A consume services produced by immobile providers in country B; this cross-border trade is comparable with ordinary goods trade but remains the exception; today, it can take place with data transmission, airline tickets and certain financial services (via telecom services, which are inputs into these services);

Type 2 Consumption abroad. Mobile users from A consume services in B (tourism, ship repair, special education and health care);

Type 3 Commercial presence. Providers from A establish a branch or subsidiary in B in order to produce services locally (This is the dominant pattern in business services, financial services and distribution and is a direct consequence of internalities.)

Type 4 Movement of service provider. Mobile providers from A provide services in B (business services such as accountancy and consultancy, transport and some forms of construction services) [2].

These four modes make abundantly clear that the old notion of services being typically 'domestic' is false. Types 3 and 4 are called 'service factor trade', permanent for the first one and temporary for the latter (Ruane, 1990). The prevailing models in services trade theory usually follow a form of types 3 or 4 (Sapir & Winter, 1994) [2].

In actual practice the distinctions are somewhat blurred. Relying on types 3 or 4 may sometimes facilitate type 1 trade; type 3 transactions may be complemented by additional type 4-ones; type 3 ones may be a response to type-2 flows (e.g., German hotels serving German tourists on the Spanish coast) [2].

The taxonomy of modes helps to classify the barriers accordingly. Cross-border trade was often impossible in the EU before EC-1992 since host country control tended to be unquestioned. Mobile users (type 2) are relatively free as a rule although subsidies and insurance problems may reduce the entitlements of foreigners to have access to services such as special health care and higher education; for tourists, special insurance products have largely resolved these problems. Note that the modes here are complementary: tourists may consume tourism services on Italian beaches but their travel insurance will normally be provided in the country of origin (but perhaps by a foreign-

owned company) and their air travel may be provided by Alitalia, or by the origin country's airline(s) or by a services of competitors from other countries, be they charters or trunk carriers. Barriers to foreign direct investment in the EU (type 3) have been low or negligible since the early 1960s and national treatment is provided directly by the treaty, but type 4 barriers frequently pre-empted its actual relevance. The dominance of type 3 services is demonstrated by recent empirical work (Sapir, 1993): the ratio of FDI services inflows to services imports was three times the comparable ratio for manufacturing [2].

A Note on Services Trade Theory

The theoretical work on services trade does not provide a basis comparable to that for customs union of goods. The main preoccupations have been to prove that comparative advantages apply to services trade just as well as to goods trade and that cross-country differences in factor endowments and technology are key determinants of services trade, too. The work on the welfare implications of barriers to services trade is more developed but highly disparate [2].

Francois (1990a) shows in a complex model where services are used for coordinating and linking together specialised intermediate producers, the expanded opportunities for trade in differentiated goods result in increased specialization, a growing production of services and a rise in welfare. In Francois (1990b) services and goods are produced with different types of labour with which the two economies are differently endowed. With free trade in goods but not in services, services will be cheaper in the country better endowed with the relevant factor. With services trade opening up, the number of product varieties increases as does scale, leading to greater specialization in both goods and services and a relative price decrease of manufactured goods. The returns from increased specialization are in addition to the standard (comparative advantage) gains where liberalizing of services occurs [2].

In the EU it is well-known that although services were protected everywhere to some degree, regulatory protection and restrictiveness were especially severe in Portugal, Spain, Italy and Greece. Before EC-1992 this could have been viewed as a legacy of the 'developmental state' (Italy) of the 1950s or simply as infant protection. If such protection were justified, EC-1992 would have led to welfare losses in these countries and possibly to greater dominance of 'Northern' service providers. The crux of the matter is that, without regulation, fly-by-night firms (without reputation and permanence) preclude the entry of efficient domestic firms since the latter's reputation is not yet known (in the first period), but their costs are higher than those of the charlatans. The fly-by-night firms hardly affect the (foreign) companies with established reputations [2].

Grossman and Horn (1988) consider two ways to rectify the sub-optimal market equilibrium: public policy through trade protection, and market response in that domestic entrants build up their reputation through investment; however, the market response takes time. Because a two-period analysis could take this reputation effect into account, the authors distinguish cases with temporary and permanent protection, and with and without investment in reputation, four combinations in all. They show that trade protection cannot correct the market failure and hence that either infant service protections lowers welfare, or, if it increases welfare, then the protection must remain forever [2].

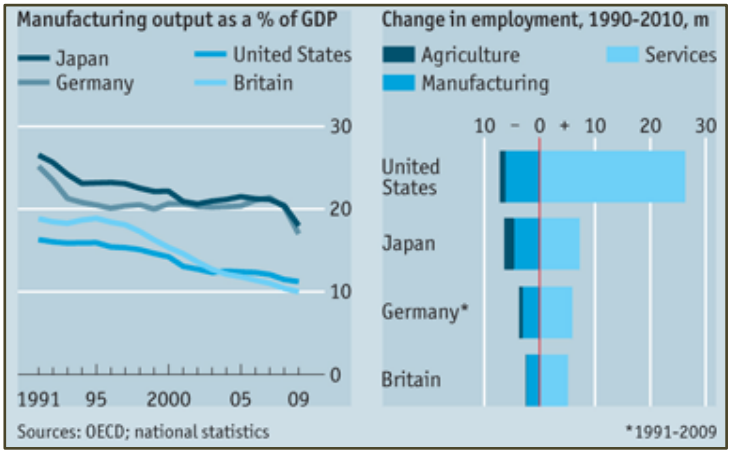
To understand the core issue, take the combination of temporary ('tariff') protection and private investment in reputation. Initially, protection is bound to lower welfare because the temporary tariff protects both charlatans and serious entrants. Protection does not correct for the moral hazard problem because it does not alter the incentives to provide high quality rather than pretend. The rents will attract additional charlatans and thereby exacerbate adverse selection. If protection were maintained in the second period (i.e., be permanent), it could produce excess capacity precisely caused by additional charlatans having entered the market. Such a promotion of services as an industry would be welfare decreasing [2].

Services in the news

Many people in rich countries view the steady decline in the share of GDP that comes from manufacturing (see left-hand chart) with disquiet. This popular perception has academic champions, too. Michael Spence and Sandile Hlatshwayo[1] argued that the US economy must find ways to expand employment in "tradables": industries whose products are traded across borders (e.g., service sectors like finance, but more often in manufacturing) [4].

They study the US's labour-force figures and find that tradables contributed almost nothing to US job creation between 1990 and 2008. The US economy saw a net addition of 27.3m jobs. Almost all of this was in non-tradable service industries, like education, health, retailing and government services, which added 26.7m jobs. The extra 0.6m jobs in tradable industries stemmed from growth in tradable services like finance and insurance, where gains marginally outweighed losses in manufacturing jobs [3].

These broad trends in job growth by sector were similar in other rich countries (see right-hand chart on change in employment), which suggests that they are subject to common factors. Technological change and globalisation are the likeliest candidates. In combination, these have allowed countries to specialise not in entire goods or services, but in specific stages of the production process. Lower-value-added bits of the production chain moved to the developing world, where labour was cheaper. Higher-end jobs remained at home. As a result, even as overall employment in US manufacturing declined, its value-added per worker soared. In tradable services, where the US continued to have a comparative advantage, both value-added and employment rose concurrently. The same happened in non-tradable services, which, by definition, need to be done where consumers are based [3].



Why worry about this? The two economists fear that demand for non-tradables may not continue to grow at the pace of earlier decades, as the government and cash-

[1] Spence, M. and S. Hlatshwayo, "The Evolving Structure of the American Economy and the Employment Challenge", Council on Foreign Relations, working paper, March 2011.

strapped consumers both cut back, affecting sources of job growth like retailing, health care and government services. So they argue in favour of the US explicitly targeting some public-sector investment towards technologies that might expand the scope of the tradable sector. “The structural evolution of the economy matters”, they write, “and can be influenced in relatively efficient ways” [3].

In fact, it is far from clear whether, and how, such a policy might work. But many would question the need for this sort of industrial policy in the first place. In 2011, the US remained the world’s largest manufacturer. Both the US and Japan roughly doubled manufacturing output between 1980 and 2009; nowhere in the G7 did output decline in absolute terms. Lower-end manufacturing had indeed moved to countries like China, with their masses of cheap labour, but it is not obvious why this pattern of comparative advantage should be resisted [3].

Jagdish Bhagwati of Columbia University reckons that those who argue in favour of boosting rich-world manufacturing suffer from a “manufacturing fetish”. One reason for the fascination with manufacturing, Mr Bhagwati says, is the mistaken belief that it is more technologically dynamic than service industries. He points to logistics companies, major retailers and mobile telecommunications as sources of innovation in non-financial services, and to genetically modified seeds as a prominent example in agriculture. Dale Jorgenson of Harvard University thinks that US services companies, particularly wholesale and retail traders, reaped huge gains during 2000-10 from information technology. Companies like Walmart and Cisco built global supply chains, linking cash registers at retail outlets with factories around the world [3].

Mr Bhagwati also argues that a second assumption of the fetishists—that manufacturing is better for job creation—is fundamentally flawed. Changing the composition of output in favour of manufacturing industries need not matter critically for job creation, he says. Increasing demand for non-tradable services should do just as well, as the years before the global financial crisis attest [3].

Nor is it clear that global demand for services—tradable or not—is going to slow. As emerging economies become richer, they will want more of all sorts of services, including sophisticated ones where countries like the US and UK retain a comparative advantage. Those who pitch for manufacturing on the ground that it is better at boosting exports often ignore the fact that an increasing number of services are traded, and that rich countries tend to export more of them than they import. The US and UK, for instance, typically run surpluses in services [3].

Rich countries do face hurdles in capitalising on their strengths, however. Trade in services still remains far too restricted, and not only in emerging economies. Mario Monti of Bocconi University in Milan found that only 20% of services provided in the EU have a cross-border component, for instance. Efforts to free up trade in services may bring more benefits than calls to boost manufacturing [3].

Asymmetric information in services should raise questions regarding whether your doctor, mechanic or taxi driver cheats consumers. Gianfranco Domenighetti, an economist at the Cantonal Health Office in Ticino, Switzerland, set out to discover whether surgeons performed more operations than were strictly necessary[2]. He and his colleagues found that the more sophisticated the patient, the less scalpel-happy the doctor. The best informed patients of all are, of course, other doctors. Sure enough, physicians went under the knife much less often than the average Ticino resident. (Lawyers' wives—whom doctors have good reason to fear—had the fewest hysterectomies of all [3]) [4].

Surgeons belong to a class of experts—including computer engineers, car mechanics, taxi-drivers and others—who enjoy a fortunate position in relation to their customers. Not only do they provide a valued service (a cab ride, a repair, an operation), they also tell the customer what service she needs (a long trip, an engine overhaul, a hysterectomy). Their services are known as “credence goods”, because customers take it on faith that the supplier has given them what they need, and no more [4].

But as the Swiss studies show, it pays not to be too credulous. Customers can be overcharged—billed for something they did not get—or “overtreated”—given something they did not need. A mechanic might replace a car's gasket, but bill the customer for a new engine. Or he might replace the car's engine, when only a new gasket was needed. Customers may not know what the expert knows, but they know the incentives the experts face. If everyone acts on this knowledge, the market should, in theory, eliminate some of the incentives for expert dishonesty [4].

Suppose a customer can tell if his car has been fixed or not—it works, or it doesn't—but he cannot tell how it was fixed. In such cases, the mechanic has every reason to charge his customer for new brakes, even if only the brake pads were replaced. The customer should anticipate this and be resigned to it: whatever the size of his car's problem, one can be sure the repair bill will be large [4].

Messrs Dulleck and Kerschbamer pursue this logic another step. If all customers share the same fatalism—as they should—what would the market for experts look like? When punters shop around for a mechanic or a plumber, they will ignore advertised prices for simple jobs. However attractive those rates may be, customers know they will never be lucky enough to pay them. They will instead prefer those experts who charge the least for elaborate procedures: new brakes, not new brake pads [4].

As a result, experts attract customers by shaving their prices for big jobs, and they do not lose any customers by raising their charges for small jobs. Consequently, the prices for all jobs, big and small, will tend to converge. In the extreme, Messrs Dulleck and Kerschbamer show, experts will charge a flat fee for all their services. In a competitive market, they will undercharge for expensive remedies, and overcharge for simple ones [4].

Is that extreme ever reached in real-life markets? Some estate agents now charge fixed fees for selling properties, shamed perhaps by the fact (demonstrated by Steven Levitt and Chad Syverson of the University of Chicago) that agents on commission sell their clients' homes more quickly and cheaply than their own [4].

Messrs Dulleck and Kerschbamer repeat some sage advice: if a car mechanic tells you a part has been replaced, ask to have the part put into your boot. In many cases, customers can check that the expert really did what he said he did. Even Swiss doctors cannot pretend to remove someone's tonsils without really doing so. In such instances, customers cannot be overcharged. But they can still be overtreated. They know what procedure they received, but not what they needed [4].

Even if self-diagnosis is beyond them, however, customers can still diagnose the incentives experts face from the prices they post. If a surgeon enjoys fatter margins on bigger

[2] For example, “Revisiting the Most Informed Consumer of Surgical Services”. *International Journal of Technology Assessment in Health Care*, No.4, 1993

[3] “On Doctors, Mechanics and Computer Specialists: The Economics of Credence Goods”. *Journal of Economic Literature*, March 2006

operations, he can be counted on to favour them. In principle, therefore, customers should flock to doctors who charge a uniform mark-up on all their procedures. In such surgeries, the price for complicated operations will be higher, but the margin will be the same. That way, the surgeon has no incentive to overtreat his customers. Do such surgeries exist in practice? That would be too much to hope. But many car garages now advertise standard job-completion times and then charge a uniform hourly rate. In other settings, the margins for quicker services are actually higher. In 2006, New York taxis, for example, charged $2.50 the moment one sat in them, and another $2 for every mile covered [4].

Unfortunately, this pricing solution works only if taxi-drivers and mechanics are fully employed. When they have no trouble finding fares, taxi-drivers have no reason to take you the long way round. If they were not serving you they could be making as much money, or more, serving the next person. In quiet periods, however, the opportunity cost of "overtreating" clueless passengers falls, and the rewards rise. If the driver doubts he can find another fare, he would rather have you in his cab paying $2 a mile, than no one at all. In closing, Messrs Dulleck and Kerschbamer therefore offer advice that would otherwise seem counterintuitive. If you are worried about being cheated by a taxi-driver or a mechanic, pick the busiest one you can find [4].

To avoid the asymmetry in services markets, licensing is a means of ensuring quality and reducing fraud. In the 1950s, fewer than 5% of US workers needed a licence to operate. After three decades of deregulation, the share was almost 30% in 2011. Add to that people who were preparing to obtain a licence or whose jobs involved some form of certification and the share is 38%. Other rich countries impose far fewer fetters than the land of the free. In the UK only 13% of workers needed licences (though that doubled in 12 years) [5].

Some occupations clearly need to be licensed. Nobody wants to unleash amateur doctors and dentists on the public, or untrained tattoo artists for that matter. But, as the *Wall Street Journal* has doggedly pointed out, the US's Licence Raj has extended its tentacles into occupations that pose no plausible threat to health or safety—occupations, moreover, that are governed by considerations of taste rather than anything that can be objectively measured by licensing authorities. The list of jobs that require licences in some states already sounds like something from Monty Python—florists, handymen, wrestlers, tour guides, frozen-dessert sellers, firework operatives, second-hand booksellers and, of course, interior designers—but it will become sillier still if ambitious cat-groomers and dog-walkers got their way [5].

Getting a licence can be time-consuming. Want to become a barber in California? That will require studying the art of cutting and blow-drying for almost a year. Want to work in the wig trade in Texas? You will need to take 300 hours of classes and pass both written and practical exams. Alabama obliges manicurists to sit through 750 hours of instruction before taking a practical exam. Florida will not let you work as an interior designer unless you complete a four-year university degree and a two-year apprenticeship and pass a two-day examination [5].

The cost of all this is huge—unless, that is, you are a member of one of the cartels that pushes for pettifogging rules or an employee of one of the bureaucratic bodies charged with enforcing them. Morris Kleiner of the University of Minnesota calculates that licensing boosts the income of licensees by about 15%. In other words, it has about the same impact on wages as membership of a trade union does. (Trade unionists who are also protected by licences enjoy a 24% boost to their hourly wages.) Mr Kleiner also argues that licensing slows job-creation: by comparing occupations that are regulated in some states but not in others he found that job growth between 1990 and 2000 was 20% higher in unregulated occupations than in regulated ones [5].

The Institute for Justice, a free-market pressure group, argues that this is only the beginning of the Raj's sins. The patchwork of regulations makes it hard for people to move from state to state as a license to provide a service in one state does not give license to practice in all states. The burden of regulations falls most heavily on ethnic minorities (who are less likely to have educational qualifications) and on women (who might want to return to work after raising their children) [5].

Taxi sub-sector

Taxi markets have long needed a competitive shake-up. In theory, entry should be easy—only a car and a driving licence is needed. New drivers would bring fares close to costs. Instead, regulations keep entrants out. In New York in 2013, two taxi medallions sold for $2.5m. In London a test of familiarity with the city's streets takes four years to complete, despite GPS making this redundant. Taxi markets are characterized as cabs being in short supply and fat profits for the vehicle owners [6].

Uber aimed to change this. Launched in San Francisco in 2009 passengers hail drivers from smartphones. Uber's prices are slightly cheaper than a street-hailed cab, but when demand spikes, a surge price kicks in: during the busiest times, e.g. New Year's Eve, rates can be seven times normal levels, and minimum fares of up to $175 apply. For some it seems unfair that Uber price discriminates depending on the time of the journey, but this is not necessarily a bad thing [6].

Mark Armstrong (2006) of Oxford University explained that customers who value a good at more than it costs to produce can lose in a single-price system—ask anyone who has tried to find a cab on New Year's Eve. Nondiscriminatory pricing implies a trade-off: more sales at lower prices, and lower profit on customers prepared to pay more. Higher prices at 2am are not just because of fewer drivers, but also from higher willingness to pay. Price spikes raise a Uber driver's pay (80% of the fare), tempting more cabs at high demand [6].

Jean-Charles Rochet and Jean Tirole (2006) of Toulouse University note that firms often tilt the market to give one side a deal: nightclubs let women in free to justify charging men a hefty fee, telephone directories are given away to create a readership which advertisers pay to access. The theory predicts each side's deal depends on two things: price sensitivity and how well-stocked each side of the market is. Uber's price surge fits perfectly: Friday-night revellers are hit by a double whammy since they are willing to pay up precisely when the pool of cabs is low [6].

There is evidence Uber's surge pricing improved taxi markets. Drivers are price sensitive, and more Uber drivers go onto the roads at anti-social hours. Uber says there are more private cars for hire in San Francisco at peak hours [6].

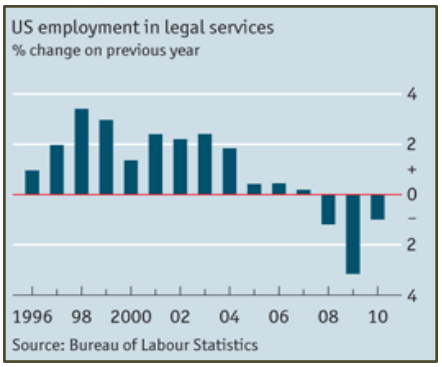
However, Uber's inflexible matchmaking fee may not be the best strategy. A fixed 20% of the fare means that it may fail to optimise the matching of demand and supply. In slow times (low fares) it may work well. Suppose lots of potential riders are willing to pay $20 for a trip that drivers are happy to receive $15. A 20% ($4) fee works for both sides. By contrast, on a Friday night, with riders willing to pay $100, and drivers happy to take $90, there is scope for a deal, but a $20 fee implies a mismatch. A fixed membership charge is a better option in two-sided markets. Charging drivers a flat monthly fee can generate revenue without creating a price wedge, preventing a match. If paying cash up front puts off

infrequent drivers, a cheaper membership category can be created. Uber should keep its surge pricing, but to really revolutionise taxi travel, it might need to retune its fees [6].

Legal Services

The law is becoming more of a business than a profession. Some countries protect their turf – foreigners cannot practise Chinese law and practising Indian law is limited. Legal-process outsourcing firms doing routine document reviewing without advising clients put further downward pressure on the demand for new graduates [7].

A noticeable change in US employment in legal services occurred after 2004. After a dozen years of growth, employment in the US law industry declined (see chart, US employment in legal services). The forces that hit the legal profession include: the drying up of work on mergers and acquisition (M&A) without anything similarly profitable taking its place (bankruptcy, securities litigation and regulation were rare exceptions in 2009); and clients became keener to query their bills and to demand alternatives to charging by the hour (flat or capped rates, or contingent fees). Small and innovative legal firms began obliging them, and big firms were forced to follow suit. [7].



Second, legal services are globalising. Emerging markets, especially in Asia, lead New York and London firms in extending their reach. The growth of outsourcing to places like India is not lost on money-conscious clients, some of whom demand that their lawyers pass routine work to cheaper contractors. Third is technological change in an industry synonymous with trained human judgment. Software performing tasks like “e-discovery” (sorting through e-mails and digital records for evidence) saves money. It also makes it harder to sustain a business model where partners sit atop a pyramid with a fat base of associates who carry out routine and repetitive work billed expensively [7].

What kind of firm will thrive in the new environment? One type is the elite New York firm that covers a wide spectrum of legal work. These have become internationalised, through longish histories in Europe and recent moves into Asia and Latin America. They do not try to be everywhere, but cover mainly the leading financial centres. Nor do they try to do everything, offering a range of services on which their New York businesses were built: M&A, finance, etc. Another type are firms that concentrate on only a few fields, with some specialised in only one. These are less globalised, preferring to build partnerships with leading local firms. The third type are big and well-known firms without the reputations of the first two. Their promise is that wherever clients do business, they will deal with a seamless entity [7].

Services and Manufacturing

How big is the service side of manufacturing? The combined global sales of all manufacturing companies involved in making goods such as cars, computers and clothing are put at about $15,000bn a year. Of this, 10-20% comes from a service function, whether it is charged for separately by the company or included in the price customers pay. An example of the former is the service contracts agreed by customers with producers of, for instance, jet engines to ensure the latter are maintained while in service. An included service might be a consultancy fee, which a customer is effectively paying for when it specifies a complex piece of manufacturing or medical equipment from a goods producers, even if the arrangement is not made explicit. The customer expects the item to be more or less made to order. The consultancy part of the interaction is included in the price agreed by the two parties for the equipment [8].

McKinsey, a consultancy, says that more than one-fifth of all revenues of the US durable goods industry – which encompasses manufacturing fields that include machinery, appliances and vehicles – comes from services associated with the products. McKinsey’s director says no one has estimated an equivalent figure for the whole of global industry, but it could easily be a similar proportion. A service approach links in with the increased interest from many manufacturers in product customisation – in which items are made in small volumes and geared to the needs of users. It is a part of the general move for manufacturers to know their customers better [8].

"If companies have a good service relationship with the customers, they are more likely to be in a position to know enough about them to configure products to suit their needs," says Mr Auguste from McKinsey. Manufacturers' services activities vary considerably, ranging from the customisation or configuration of products to meet requirements of users, to jobs such as testing, development, market research, equipment installation and maintenance, for which an explicit charge may be made [8].

Germany is not often told to reform. Its big manufacturers, trade surpluses and robust jobs market make it the envy of the EU. Germany's manufacturing juggernaut sits alongside puny services. The relative productivity difference is stark (see chart, productivity in manufacturing and services). In 2000-07, value added in market services grew by 2.2% a year, compared with an average of 3.1% in the OECD group of rich countries. In business services, productivity grew by 0.9% a year in Germany in 2000-08, against 1.7% in the OECD [9].

This holds back the economy. An OECD report estimates potential GDP growth will fall below 1% by 2020 as the population ages. Investment as a share of GDP is below the G7 average – one source of the trade surplus. Germany has deficits in education, immigration and finance, but services regulation is an issue. “What sticks out is protection of the liberal professions,” according to the OECD [9].

Important domestic sectors are still held back by regulation. Lawyers and solicitors enjoy privileges granted by law [10]. Regulation of professional services is stricter in Germany than in all but five of 27 countries ranked by the OECD. An

EC study found that of three sectors in 13 countries, Germany has more reserved professions than all but one [9].

Pharmacies and the health sector in general remain largely unreformed [10]. Only qualified pharmacists can own a pharmacy, and they are limited to four. Other shops may not compete, even for non-prescription drugs. Such rules are typical of the liberal professions, which account for 10% of GDP and employ 4.2m. They dictate who may offer what sort of service, the charges allowed for professionals and how they may advertise. In many professions, investment by outsiders is restricted. *Handwerk*, which embraces 150 trades from bakery to plumbing and employs 5.1m, has its own rules [9].

An American used to ads trumpeting ambulance-chasing lawyers and headache-remedies from Walmart would find Germany eerily peaceful. Doctors practise mostly on their own. Lawyers tend to be generalists and work in small groups, says Markus Hartung, at the German Bar Association. Deregulation would be disruptive: many generalist "country lawyers" could be swept away. But it would have a big payoff. Livelier services might encourage the sort of game-changing innovation that is more common in the US. In legal services, "bigger firms would offer more quality at less money," Mr Hartung believes. New business models would emerge. Companies offering legal insurance might buy law firms to handle customers' claims [9].

For business in general, the licensing and permit system is burdensome, acting as an obstacle to entrepreneurship in the services sector. Tradesmen must be members of trade organisations, which can act as a barrier to entry [10]. According to OECD data from 2008, Germany ranked only 18th – behind France and Spain – in terms of ease of entrepreneurship. If Germany were to reduce services regulation to the level of the most liberal countries, it could boost annual productivity growth by 1% point a year over ten years, says one study. Wages and domestic demand would rise and the current-account surplus would fall. Germany has loosened up a bit: prices of non-prescription drugs have been freed and in trades such as brewing a master's certificate is no longer required [9].

Politicians are reluctant to tamper with the *Handwerk*, whose apprenticeships keep down unemployment among the young. The liberal professions are largely self-regulating and perform functions that the state might otherwise have to, such as setting standards and providing training. Quality and competition in German professions compare well with the rest of EU, says Rolf Koschorrek, president of the Federal Association of Liberal Professions [10].

The consequence is an economic model in which the services sector has hardly increased in importance. The sector's share of the total economy remained at 68% since 1995, according to the EC, in contrast to its rising importance in Japan, the US, UK and other EU countries. This failure has held back German economic performance. Empirical evidence suggests that reforms to remove entry barriers and foster competition would not only improve productivity but also raise investment. A reduction in the regulation-driven entitlements in the German services sector could therefore increase output substantially [10].

New business opportunities would trigger investment in the sector and also offer new employment opportunities. This would make the German domestic sector more attractive and probably lead to higher wages underpinned by higher productivity. These reforms could also improve the quality of German exports. The manufacturing sector depends on the provision of cost-efficient and innovative solutions from the service sector. Higher overall German growth would be the likely result of such a liberalisation push [10].

India's services revolution dazzled businesses in the rich world, turning Indian companies into global competitors and backwater cities such as Hyderabad into affluent, sophisticated technology centres. Yet economists have been less star-struck, clinging to the received wisdom that has prevailed since the industrial revolution: modernisation runs from agriculture through manufacturing and only later to services. Now some have broken ranks. Can poor countries leapfrog manufacturing and grow rich on services [11]?

The logic supporting the conventional path towards an advanced economy is straightforward. Development typically involves moving workers from low-productivity activities such as subsistence farming to high-productivity sectors. That points to a shift into manufacturing because it lends itself to specialisation and economies of scale, both essential for rising output per worker. As first Japan, then Taiwan and South Korea, and now China have demonstrated, manufacturing can also accelerate development because its output can be exported to rich countries [11].

Services, in contrast, appear to be a graveyard for productivity. Because a haircut or a restaurant meal has to be delivered in person, there is almost no potential to exploit economies of scale and to export. People consume more services not when technological advance lowers their price but when they have reached a level of affluence that satisfies most of their other needs. Indeed William Baumol[4], famously argued in the 1960s that as countries grew richer and their citizens became keener on buying services, their productivity growth would inevitably slow [11].

That conventional wisdom came under fire in a book edited by Ejaz Ghani of the World Bank[5] and a related article he wrote with Homi Kharas of the Brookings Institution and Arti Grover also of the World Bank on the VoxEU website[6]. The authors argue that technology and outsourcing enable services to overcome their former handicaps. Traditional services such as trade, hotels, restaurants and public administration remain largely bound by the old constraints. But modern services, such as software development, call centres and outsourced business processes (from insurance claims to transcribing medical records), use skilled workers, exploit economies of scale and can be exported. In other words, they are just like manufacturing. If that is the case, then poor countries should be able to go straight from agriculture to services, leapfrogging manufacturing [11].

And that is precisely what seems to be happening. India may be the most prominent example[7], but it is far from being the only pathfinder. Pakistan, Sri Lanka and Nepal have imitated India, albeit less spectacularly. In poor countries as a whole, services have contributed more to growth since 1980 than has industry. Productivity growth in services has also outpaced that of industry in India, Pakistan and Sri Lanka. In all three, the level of productivity (measured at purchasing-power parities) is higher in services than in industry. In Nepal, productivity is three times higher in services. The opposite pattern prevails in East Asia. As Mr Ghani writes, "South Asia resembles the growth patterns of Ireland and Norway, rather than that of China and Malaysia" [11].

Underlining their role as an engine for, rather than product of, development, exports have swelled from roughly 6% of

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[4] Baumol, W.J., "Macroeconomics of Unbalanced Growth: The Anatomy of Urban Crisis", *American Economic Review*, 57(3):415-26, 1967.
[5] Ghani, E., ed. *The Service Revolution in South Asia*. Oxford University Press, 2010.
[6] Ghani, E., A. Grover and H. Kharas, "Service with a smile: A new growth engine for poor countries, VoxEU, 4 May 2011.
[7] Eichengreen B. and P. Gupta, "The Service Sector as India's Road to Economic Growth", NBER Working Paper, 2011.

services output in poor countries in 1985 to almost 10% in 2005. Burundi, Swaziland and Rwanda all recorded growth of more than 25% a year in services exports between 1995 and 2008. Kenya exports professional services such as accounting to its neighbours[8] [11].

Services offer several advantages over manufacturing. They can more readily employ women and are less likely to despoil the environment. Located in big cities, they accelerate urbanisation. Modern services are arguably less vulnerable to protectionism than either traditional services, such as lawyers, or goods, both of which require physical entry to the foreign market [11].

Services, however, may not be the answer for all countries. South Asia benefited from a good deal of luck. India's leading software exporters were founded by engineers educated in the US who had returned home. The prevalence of English speakers helps to sell services in the US. Other developing countries lack these advantages [11].

Most problematic of all, modern services require skilled workers, not the unskilled type that poor countries have in abundance. In South Asia, service workers typically have one to three more years of education than industry workers. In modern services, school grades or a university degree are often necessary. The flip side of their high productivity is that modern services employ relatively few people. Just 2m of India's population of 1.2 billion work in information technology; in the rest of South Asia, only 100,000 do. That is one reason why India is still keen to promote manufacturing, which is also booming [11].

Indeed, for many countries, the success of services is an indictment of their failure in manufacturing. In India and Sri Lanka, restrictive labour laws have hamstrung the emergence of a more competitive manufacturing base. In contrast India helped its information-technology sector by declaring it an essential industry and lifting the prohibition on operating around the clock in some states. In South Asia services have benefited from investment in telecoms infrastructure, as measured by the number of phone lines and personal computers per 100 people, whereas manufacturing is held back by a shortage of paved roads. This suggests that for countries that avoid those problems the conventional wisdom is still right: manufacturing holds the most promise for millions of reasonably well-paying jobs. For those not so lucky, at least there's an alternative [11].

Servicing Manufacturing: The Case of India

India has developed an edge in the service aspects of manufacturing, say some observers. Once regarded as peripheral to the "core" task of production, these areas include design, development, links with suppliers and the ability to customise output to meet changes in demand patterns. The services elements are becoming more important as manufacturers seek more sophisticated links with suppliers and customers demand greater customisation in the finished product. In many manufacturing companies, no more than one-fifth of employees are defined as manufacturing workers. The majority are doing jobs more properly categorised as service occupations. Sometimes – as in the case of pure "product originators" such as Nike, the clothing company, which outsources virtually all of its production – the proportion falls close to zero.

The service activities in manufacturing span a range of tasks, from maintenance contracts to design work. Some of the costs of these are bundled inside the price of goods, while other are paid for separately.

One reason for this is that manufacturers often turn to service as a defensive strategy to protect themselves from rivals muscling in on their territory. Anita Woulf of the Centre d'Etudes Propectives et d'Informations Internationales, a Paris-based economics institute, says: "Manufacturers all over the world are increasingly interested in services as a way to make themselves more competitive and also to find new sources of growth."

India's recent history puts it in a good position to exploit this shift, says Anand Sharma, president of TBM Consulting, a US-based manufacturing advisory group. The seeds of the country's prowess in manufacturing services were sown back in the 1990s, he says, when it became a world centre in software development and business process outsourcing (BPO), in which providers take over jobs such as payroll administration on behalf of customers in other countries. Together, software development and BPO provide fast-expanding revenues for India-based companies of about $23bn a year, and account for 1.3m jobs. India's growth in this field – as in the service side of manufacturing generally – is boosted by its proficiency in English, the world's business language. Another attraction is the fact that the cost of employing engineers – essential to manufacturing services – is one-third to one-fifth lower than in industrialised nations such as the UK and the US.

"The BPO boom in India provided a core of expertise in software and a service-based approach to customers based around the world," says Mr Sharma. "It has led to an interest by manufacturers [in India] to add value to basic manufacturing through offering services."

Arvind Subramanian, an economist at the Washington-based International Monetary Fund, says India's ability to compete in this field is based on its focus on fairly small-scale manufacturing operations, aimed at turning out goods in small batches and with close consultation with customers – a prerequisite for a service-based approach. He adds that there is "no doubt" that India has a global competitive advantage when it comes to service-based manufacturing.

If Indian manufacturers are to capitalise on the services model, links with international companies are vital. The Indian market for engineering goods remains relatively small, though it could expand considerably. While China's manufacturers have made their mark on the global economy mainly through exporting, Indians are doing far more to set up production centres outside their home country and linking these to a "services" approach.

Mahindra & Mahindra, for instance, is setting up a global network of vehicle parts factories – linked to its production operations in India – that will make specialised components to order on behalf of large western car-makers. And Bharat Forge, a large India-based components manufacturer, is establishing plants in the UK, Germany and the US to supply customers in these markets.

Elsewhere, Essel, an Indian Packager, has set up plants outside India to connect with large cosmetics manufactures such as L'Oréal. In this way, its customers have more say in the products, even specifying what they look like. Other India-based packaging rivals are following Essel's lead to build on the outward-looking approach – coupled with a way of looking at manufacturing as a combination of production and services, critical for India's manufacturers. What will give companies [in India] an edge is a combination of technology and service, he says [12]. ♦

[8] Dihel, N., A.M. Fernandes, R. Gicho, J. Kashangaki and N. Strychacz, "Can Kenya become a Global Exporter of Business Services?", *Trade Negotiations Insights* 10(9), International Centre for Trade and Sustainable Development, Dec 2011.

Services Integration within the EU

In 2005, a Franco-German-led effort rejected the EU services directive aimed at breaking down barriers to trade in services across the EU. Manufacturing trade was mostly freed up by the internal-market programme of the 1990s, but national rules still put obstacles in the way of service providers that want to trade outside their home country, be they lawyers or architects [13].

The EC was taken by surprise by the backlash it faced. The original proposal came from the previous commission where it was passed unanimously and with little discussion. It had been demonised by trade unions and the left across western Europe. Frits Bolkestein was the commissioner who originally proposed the directive, a Dutch liberal whose name is conveniently reminiscent of Frankenstein. French socialists seized upon the "Bolkestein directive" as encapsulating everything they loathed about the "ultra-liberal" Europe that allegedly was promoted in Brussels. Martin Shultz, leader of the Socialists in the European Parliament, said that, if the directive were passed unchanged, it would have meant "the destruction of the European social model" [13].

Opponents' outrage focused on the directive's "country of origin principle", allowing service providers based in one EU country to offer their services in another, provided only that they satisfied their own national rules and laws – i.e., the model for what was done for goods in the 1990s. This was to avoid the risk that the creation of a single market in services might necessitate more red tape, as Brussels sought to define harmonised standards for every sector [13].

The country of origin principle was an open invitation to "social dumping", in which competition from poorer EU countries would drive down wages and welfare standards in such countries as France and Germany. German nerves were on edge after widespread reports of a wave of job losses among workers in slaughterhouses, who were apparently being displaced by butchers employed by central European contractors. German trade unions complained that the newcomers undercut wages and hygiene standards. They feared that further liberalisation of services could lead to similar outcomes in other industries, such as construction and nursing. The call was for a revised directive "to safeguard the European social model" [13].

Fans of the EC proposal said many of these concerns were catered for in the directive: e.g., "posted workers" would have to obey local social and labour legislation, wherever they are working; and it would be illegal to undercut a host country's minimum wage or health-and-safety regulations, or to break French law on the 35-hour-week. Particularly sensitive services of public interest, such as transport and much of health care, were left outside the directive's scope [13].

Opponents of the directive "won the debate". Substantial amendments were to be proposed. Mr Charlie McCreevy, the EU's internal market commissioner, promised to reconsider the exceptions and expand them, in deference to national sensitivities. The risk is that so many "exceptions" are written into a revised directive that the overall effect would be next to no liberalisation. Worse, an effort to meet Franco-German demands for "minimum standards" for European service providers could lead to new regulations being imposed on countries with relatively liberal regimes. Economic liberals such as Paul Hofheinz of the Lisbon Council, a Brussels think-tank, considered McCreevy one of his own, asked "what is the point of an internal-market commissioner who does not stand up for the internal market?" Clearly, regulatory and protectionist instincts still run deep in the countries that invented the Napoleonic code and the craft guild [13].

The EU's single market was supposed to come into effect on January 1, 1993, providing freedom of movement in four areas – goods, capital, people and services. The single market for services does not yet work because numerous sectors still hide behind de facto national barriers. Companies and individuals operating in these sectors are understandably upset that their turf is threatened [14].

When EU leaders met in Lisbon in 2000, they agreed to put together "a strategy for the removal of barriers to services". Mr. Chirac and Schröder were among the few EU leaders in Lisbon who were in office when the services directive was proposed. Their opposition to the directive was particularly disingenuous. Did the monstrous proposal actually contain any radically new elements? No. It laid out three ways in which services could be provided across borders: a firm sending an employee abroad; an individual setting up shop in another country; or someone providing a cross-border service from his/her home country [14]. These are modes 1,2 and 4 under WTO rules.

The legal framework for their first option is already clear under another directive on the posting of workers. European case law on freedom of establishment applies to the second option: a lawyer, say, or a doctor wishing to establish an operation abroad has to fulfil the requirements of the host country, but these requirements cannot be used to discriminate against EU nationals from another member state. It is only in the third case that the legal framework is not entirely clear. However, given the presumption that there should be an internal market in services, the European Court has repeatedly struck down national barriers to trade in services. The directive's main contribution is to codify existing case law by explicitly stating the country-of-origin principle – under which home-country rules apply to cross-border service providers – and listing prohibited discriminatory or restrictive measures [14].

The directive would open a market that represents roughly half of the EU's GDP and 70% of its jobs. Sweeping away the obstacles could stimulate growth and generate potential gains.[9]

EU enlargement fuelled concerns on the part of citizens of existing member states that the directive would lead to "social dumping", if higher standards of social protection in richer member states are eroded by competition from lower-cost countries. Germany and France's adverse reaction in railing against the EU "liberal" bias show how "old" Europe prefers to moan about unfair competition rather than turn enlargement into an opportunity. The directive cannot be changed substantially without violating the basic principles of the EU single market - a case of an irresistible force meeting an immovable object [14]. ♦

Case of EU Services Dis-Integration

At Solderfjardsskolan, a school perched on a slope overlooking the Baltic Sea near Stockholm, the local government hired a Latvian company to undertake the construction of a cafeteria. Plans for the construction were eclipsed by a dispute over whether the company, Laval, could pay its workers Latvian wages far lower than those paid to Swedish workers. With union picketers shouting "Go home!" at the Latvians and the Swedish government taking the union's side, the work site became a flashpoint in the gathering battle over the future of Europe's open economy. The Latvians were sent packing, but the issue needed to be resolved. Whether the Swedes were right to refuse to allow Latvian rules to apply on Swedish territory, or not, was under review at the European Court of Justice.

[9] Economic Assessment of the Barriers to the Internal Market for Services, www.copenhageneconomics.com

The Laval incident was watched closely in Brussels as the European Parliament's powerful internal market committee convenes to hammer out the shape of a controversial EU proposal to bust open the services market – 70% of the 25-nation bloc's economy – to cross-border trade.

At the heart of the services directive is the politically explosive question of whether a person must obey the rules of country they come from, or those of the country they work in. This was a factor in the defeat in France of the European Constitution in May, when broad discussion of the possibility that a "Polish plumber" could take a Frenchman's job added momentum to the no camp.

The EU's newest members, who embrace Britain's "Anglo-Saxon model" of free-market competition, argue that the services directive is vital to revive Europe's moribund economies. But many West European countries – including Sweden and Germany as well as France – have their fears. They are afraid that it would allow East European companies with lower wages and weaker employment standards to undercut their more expensive neighbours. They also resent the idea of workers benefiting from social safety nets to which they do not contribute.

Krisjanis Karins, Latvia's economics minister, sees the Laval dispute as a test case for whether the EU will allow itself to become a protectionist enclave or embrace free-market reforms vital to revive its competitiveness. "Sweden doesn't seem to have a problem using radios or television made with cheap labor in China, yet it wants to block a fellow EU member because we are threatening it with tougher competition in its own backyard," he said in Riga.

To the Swedes, however, the case is less about competition and more about Brussels overstretching its regulatory reach. "The EU's competence doesn't lie in regulating how the labor market should be organized," said Hans Karlsson, Sweden's minister of employment.

The services proposal – known as the Bolkestein directive after its author, Frits Bolkestein, a former Dutch member of the European Commission – aims to allow companies based in one country to offer their services anywhere else in the 25-member bloc while applying the labor rules of their native country. France has vehemently opposed the proposal, while Sweden has threatened to veto it if Laval gets its way.

The Laval dispute began in the summer of 2004, when the company came to Sweden to begin work at the school. Within weeks, Laval and the Swedish construction workers' union clashed when the Latvian firm refused to sign the union's collective bargaining agreement, saying it had already negotiated its wage agreement back in Latvia.

The union demanded that Swedish work conditions be applied to the Latvian workers – in this case, an hourly salary of 145 kronor, or $18. Laval was paying its workers the equivalent of about 80 kronor an hour. The union blockaded the worksite, halting the transport of supplies and taunting workers who tried to get through as "scabs."

Laval responded by taking the union to a Swedish labor court, which ruled in the union's favor. Although the Latvians went home – construction was finished by a Swedish company – the Swedish court then sought the advice of the European Court of Justice in Luxembourg.

"The EU Commission has to realize that there would be no services directive if they did not protect against social dumping," Tomas Ostros, stated the Swedish minister for industry and trade. For Sweden, losing the case would threaten a social model in place since 1938 under which collective wage deals are negotiated between unions and employers, effectively setting minimum wages in each sector of the economy. More than 80% of the country's work force is unionised, and many Swedes regard this model as the key to harmonious industrial relations.

Nonetheless, the dispute caused deep divisions, with Swedish employers supporting Laval – even going so far as to pay part of the Latvians' legal bills. "The question was whether the market should be seen as superior to the basic rights of unions," Erland Olauson, vice president of LO, the confederation of Swedish unions, said in an interview.

Swedish workers feared that foreign workers would take away their jobs at a time when unemployment is relatively high at about 6.3%. "Why should we have foreign workers here when there are already so many unemployed Swedish workers?" said Rickard Soderberg, a 29-year-old carpenter working in central Stockholm.

For Latvian officials, use of the term "social dumping" to describe the cross-border movement of inexpensive East European workers smacks of protectionism. "This notion of social dumping is insulting," said Karins, the economics minister. "I think that they mean to say is fair and real competition." Latvian business leaders said Sweden was hypocritical since Swedish companies had no problem coming to Latvia to take advantage of cheap labor there.

Officials on both sides said the case reflected wider concerns about globalization. France was one of the most vociferous critics of opening Europe's services sector to greater competition. The view was that the state should protect workers from upheavals caused by global competition. Indeed, the Laval case divided an already divided Europe. The Swedish position was supported by France and Germany, while EU commissioner, McCreeevy expressed support for the Latvians, saying that Sweden broke EU rules on the free movement of labor. He urged Europeans not to fear a borderless Europe, asserting: "We should not be afraid of the internal market" [15].

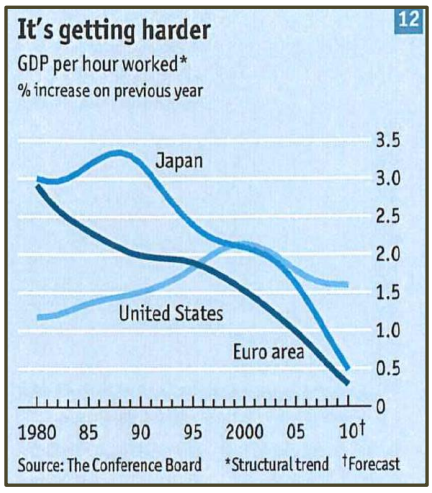
Productivity growth is the closest economics gets to a magic elixir. When workers produce more for every hour they toil, living standards rise and governments have more resources to service their debts and support those who cannot work. Workers' productivity depends on their skills, the amount of capital invested in helping them to do their jobs and the pace of “innovation”—the process of generating ideas that lead to new products and more efficient business practices [43].

The politicians' current focus on industrial policy to foster productivity growth via exciting high-tech breakthroughs misses a big part of what really drives innovation: the diffusion of better business processes and management methods. This sort of innovation is generally the result of competitive pressure. The best thing that governments can do to foster new ideas is to get out of the way. This is especially true in the most regulated and least competitive parts of the economy, notably services [43].

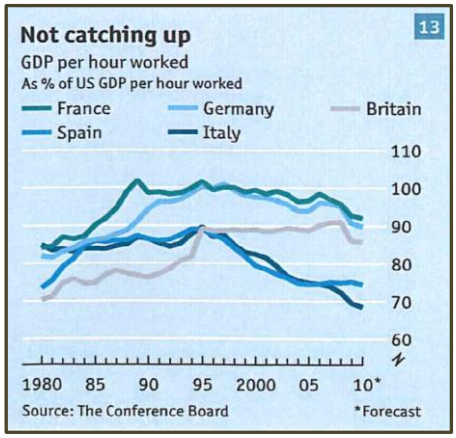
To see why competition matters so much, consider the recent history of productivity in the rich world. On the eve of the global financial crisis the rate of growth in workers' output per hour was slowing. So, too, was the pace of improvement in “total factor productivity” (a measure of the overall efficiency with which capital and workers are used which is economists' best gauge of the speed of innovation). But that broad trend masks considerable differences [43].

Between 1995-2010 the US's underlying productivity growth—adjusted for the ups and downs of the business cycle—had outperformed most other rich economies' by a wide margin (see chart 12). Workers' output per hour soared

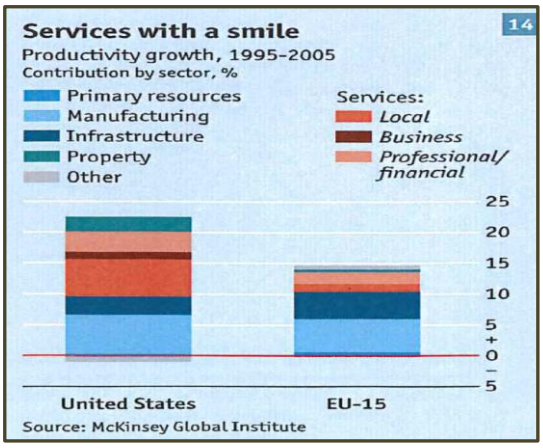
in the late 1990s, thanks largely to investment in computers and software. At first this advance was powered by productivity gains within the technology sector. From 2000 onwards efficiency gains spread through the wider economy, especially in services such as retailing and wholesaling, helped by the deregulated and competitive nature of the US's economy. The improvements were extraordinary, though they slowed after the middle of the 2000s [43].



The recent history of productivity in Europe is almost the mirror image of the US's. Up to the mid-1990s the continent's output per hour grew faster than the US's (see chart 13), helped by imports of tried and tested ideas from across the water. Thanks to this process of catch-up, by 1995 Europe's output per hour reached over 90% of the US level. But then Europe slowed, and by 2008 the figure was back down to 83%. This partly reflected Europe's labour-market reforms, which brought more low-skilled workers into the workforce. That seemed a price well worth paying for higher employment. But the main reason for Europe's disappointing productivity performance was that it failed to squeeze productivity gains from its service sector [43].



Europe's service markets are smaller than the US's, fragmented along national lines and heavily regulated. The OECD tracks regulation of product and services markets across countries since 1998. It measures the degree of state control, barriers to competition and obstacles to starting a new company, assigning a score to each market of between 0 and 6 (where 0 is the least restrictive). Overall, the absolute level of product regulation fell between 1998 and 2008, and the variation between countries lessened. America and Britain score joint best, with 0.84. The EU average is 1.4. But when it comes to services, the variation is larger and Europe has made much less progress. A McKinsey study suggests that around two-thirds of the differential in productivity growth between the US and EU-15 between 1995-2005 was explained by the gap in "local services", such as retail and wholesale services (see chart 14) [43].



In professional services, the OECD's score for Europe is fully twice as high as for America (meaning it is twice as restrictive). As the McKinsey report notes, many European countries are rife with anti-competitive rules. Architects' and lawyers' fees in Italy and Germany are subject to price floors and ceilings. Notaries in France, Spain and Greece and pharmacies in Greece are banned from advertising their services. Such restrictions limit the ability of efficient newcomers to compete for market share, cosseting incumbents and raising costs across the economy [43].

In Japan productivity growth slumped after the country's asset bubble burst at the start of the 1990s. One reason, as an earlier section of this report has described, was the failure to deal decisively with the bad loans clogging its banks, which propped up inefficient "zombie" companies rather than forcing them into liquidation. That meant less capital was available to lend to upstart firms. Another problem was the lack of competition. Japan's service sector, unlike its world-class manufacturers, is fragmented, protected from foreign competition and heavily regulated, so it failed to capture the gains of the IT revolution [43].

Sweden offers a more encouraging lesson. In the aftermath of its banking bust in the early 1990s it not only cleaned up its banks quickly but also embarked on a radical programme of microeconomic deregulation. The government reformed its tax and pension systems and freed up whole swaths of the economy, from aviation, telecommunications and electricity to banking and retailing. Thanks to these reforms, Swedish productivity growth, which had averaged 1.2% a year from 1980 to 1990, accelerated to a remarkable 2.2% a year from 1991 to 1998 and 2.5% from 1999 to 2005, according to the McKinsey Global Institute [43].

Sweden's retailers put in a particularly impressive performance. In 1990, McKinsey found, they were 5% less productive than the US's, mainly because a thicket of regulations ensured that stores were much smaller and competition less intense. Local laws restricted access to land for large stores, existing retailers colluded on prices and incumbent chains pressed suppliers to boycott cheaper competitors. But in 1992 the laws were changed to weaken municipal land-use restrictions, and Swedish entry into the EU and the creation of a new competition authority raised competitive pressures. Large stores and vertically integrated chains rapidly gained market share. By 2005 Sweden's retail productivity was 14% higher than the US's [43].

The restructuring of retail banking services was another success story. Consolidation driven by the financial crisis and by EU entry increased competition. New niche players introduced innovative products like telephone and internet banking that later spread to larger banks. Many branches were closed, and by 2006 Sweden had one of the lowest branch densities in Europe. Between 1995 and 2002 banking productivity grew by 4.6% a year, much faster than in other European countries. Swedish banks' productivity

went from slightly behind to slightly ahead of US levels [43].

All this suggests that for many rich countries the quickest route to faster productivity growth could have been to use the crisis to deregulate the service sector. A study by the Bank of France and the OECD looked at 20 sectors in 15 OECD countries between 1984 and 2007. It found that reducing regulation on “upstream” services would have a marked effect not just on productivity in those sectors but also on other parts of the economy. The logic is simple: more efficient lawyers, distributors or banks enable firms across the economy to become more productive. The size of the potential gains calculated by the Bank of France is stunning. Getting rid of all price, market-entry and other competition-restricting regulations would boost annual total factor productivity growth by one percentage point in a typical country in their sample, enough to more than double its pace [43].

Getting rid of all anti-competitive regulation may be impossible, but even the more modest goal of embracing “best practice” would yield large benefits. The IMF has calculated that if countries could reduce regulation to the average of the least restrictive three OECD countries, annual productivity growth would rise by some 0.2 percentage points in the US, 0.3 percentage points in the euro area and 0.6 percentage points in Japan. The larger gains for Europe and Japan reflect the amount of deregulation left to be done. In both cases the productivity gains to be achieved from moving to best practice would all but counter the drag on growth from unfavourable demography [43].

Even in the US there would be benefits. But, alas, the regulatory pendulum moved in the opposite direction as the Obama administration pushed through new rules on industries from health care to finance. So far the damage may be limited. Many of Mr Obama's regulatory changes, from tougher fuel-efficiency requirements to curbs on deep-water drilling, were meant to benefit consumers and the environment, not to curb competition and protect incumbents [43].

Boosting European integration could be another way to cut through national resistance to deregulation. As Mario Monti, a former EU competition commissioner, pointed out, 70% of the EU's GDP is in services but only 20% of those services cross borders. The EU's Services Directive, which is supposed to boost cross-country competition in services, has proved fairly toothless [43].

Services Negotiations and the Doha Round

In March 2001, the WTO Council for Trade in Services approved guidelines and procedures for negotiations on trade in services [16].

The main objectives and principles were:

- progressive liberalization as enshrined in relevant GATS provisions
- appropriate flexibility for developing countries, with special priority to be given to least-developed countries
- reference to the needs of small and medium-sized service suppliers, particularly of developing countries commitment to respect “the existing structure and principles of the GATS” (e.g. the bottom-up approach to scheduling and the four modes of supply) [16].

The scope should include:

- No sectors or modes are excluded from the scope of the negotiations at the outset.
- Special attention is to be given to export interests of developing countries.
- Negotiations will include discussions on eliminating existing exemptions from most-favoured nation treatment in order to ensure equal treatment among all WTO members.
- The Agreement's rule-making agenda — concerning disciplines on domestic regulation (Article VI:4), emergency safeguards (Article X), government procurement (Article XIII) and subsidies (Article XV) — is integrated into the wider context of the services negotiations [16].

The modalities and procedures were:

- Current schedules are the starting point (rather than actual market conditions).
- Request-offer negotiations are the main approach.
- Negotiating credit for autonomous liberalization is based on common criteria. These criteria were developed later by the Services Council in ‘Modalities for the Treatment of Autonomous Liberalization’ (WTO doc., TN/S/6).
- There will be an ongoing assessment of trade in services.
- The Services Council has the mandate to evaluate the results of the negotiations prior to their completion in light of Article IV [16].

A total of 71 initial offers and 31 revised offers (counting the EU as one) had been submitted by 2008, when the last offer was circulated, and the Doha Round officially died.

A 2006 report by the US Coalition of Service Industries noted that services' share of global employment had almost passed that of farming, rising from 34 to 39% between 1995 and 2006. The CSI report said liberalisation in areas such as financial and transport services would help development by supporting other businesses in developing countries [17].

But many developing countries feared they were being targeted by aggressive foreign banks and risked handing over natural monopolies such as telecommunications to foreign ownership. They tend to see services liberalisation as the price they have to pay for getting farm reform. "Progress in the [agricultural] talks would undoubtedly have had an impact and slowed down services," said Hamid Mamdouh, director of services at the WTO [17].

Services talks are conducted through a set of individual "requests" for market access from one country to another, and "offers" which reveal how much reciprocal access each is prepared to grant. It is coincidence that India, one of the few developing countries with a strong interest in concluding a services deal, found itself blocked by the US, one of the services talks' strongest proponents. US lawmakers resisted India's calls for guarantees that its IT and business processing companies would not be prevented from selling services down phone lines or by satellite, and that they would have the right to send senior staff on temporary assignments to client countries [17].

Congress still worried about the effect of offshoring on US workers. The temporary worker request was firmly refused by James Sensenbrenner, Republican House of Representatives' judiciary committee chairman. Kamal Nath, Indian trade minister, said "this is not a question of immigration – it is a question of trade". Officials not India's failure to advance its services interests gives it a perfect excuse for recalcitrance on farming, where it is in the position of fiercely resisting US demands for access to its agriculture markets [17].

INTELLECTUAL PROPERTY AND ITS PROTECTION

The WTO Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPs) is the most comprehensive multilateral agreement on intellectual property (IP). It plays a central role in facilitating trade in knowledge and creativity, in resolving trade disputes over IP, and in assuring WTO members have the latitude to achieve their domestic policy objectives. It frames the IP system in terms of innovation, technology transfer and public welfare. The TRIPs Agreement is a legal recognition of the significance of links between IP and trade and the need for a balanced IP system [18].

Intellectual property rights (IPRs) are the rights given to persons over the creations of their minds. They usually give the creator an exclusive right over the use of his/her creation for a certain period of time [18].

IPRs are customarily divided into two main areas:

(i) Copyright and rights related to copyright.

The rights of authors of literary and artistic works (such as books and other writings, musical compositions, paintings, sculpture, computer programs and films) are protected by copyright, for a minimum period of 50 years after the death of the author [18].

Also protected through copyright and related (sometimes referred to as "neighbouring") rights are the rights of performers (e.g. actors, singers and musicians), producers of phonograms (sound recordings) and broadcasting organizations. The main social purpose of protection of copyright and related rights is to encourage and reward creative work [18].

(ii) Intellectual property.

IP can usefully be divided into two main areas:

- One area can be characterized as the protection of distinctive signs, in particular trademarks (which distinguish the goods or services of one undertaking from those of other undertakings) and geographical indications (which identify a good as originating in a place where a given characteristic of the good is essentially attributable to its geographical origin).

  The protection of such distinctive signs aims to stimulate and ensure fair competition and to protect consumers, by enabling them to make informed choices between various goods and services. The protection may last indefinitely, provided the sign in question continues to be distinctive.

- Other types of industrial property are protected primarily to stimulate innovation, design and the creation of technology. In this category fall inventions (protected by patents), industrial designs and trade secrets [18].

The social purpose is to provide protection for the results of investment in the development of new technology, thus giving the incentive and means to finance research and development activities [18].

A functioning IP regime should also facilitate the transfer of technology in the form of foreign direct investment, joint ventures and licensing. The protection is usually given for a finite term (typically 20 years in the case of patents) [18].

While the basic social objectives of IP protection are as outlined above, it should also be noted that the exclusive rights given are generally subject to a number of limitations and exceptions, aimed at fine-tuning the balance that has to be found between the legitimate interests of right holders and of users [18].

Economics of IP Rights and Protection

IP can be defined broadly as creations of the human mind. IPRs are legal rights that protect these creations. Unlike rights over physical property, an IPR generally gives its owner only gives the time-limited right to exclude others from making use of their property, that too conditional upon certain criteria [19].

IPRs can be divided into two broad categories of according to their economic purpose or function. One set of IPRs aim to stimulate creativity and inventiveness so that society benefits from new or improved products, services or creative works. This category comprises of IPRs such as patents, copyright, industrial designs and various specialized IPR regimes such as the protection of plant varieties or layout-designs of integrated circuits. The second set of IPRs comprise of distinctive signs, such as trademarks and geographical indications, whose economic function is to maintain the integrity of the marketplace by correcting information asymmetries between the buyer and the seller of a good or service. There are some forms of protection that prevent unfair competition, such as passing off or the protection against the theft of trade secrets that could be included in one or both categories [19].

IPRs that aim to incentivize creativity and innovation
How do patents and copyright incentivize the creation of technological and creative works? If we take knowledge to be useful or beneficial information, then it would be difficult for any person to be excluded from using such knowledge once it is known and one person's use of this knowledge would not diminish another's enjoyment of it. Thus, knowledge largely possesses the classical characteristics of a public good such as clean air, namely non-excludability and non-rivalry. It is difficult to exclude anyone from using it once it is provided, and one person's use of it does not diminish another person's use of it. In these circumstances it is difficult to see how private actors would invest in the creation of knowledge if they cannot capture the returns from their investment in order to recover costs, since others can freely benefit from their efforts once the knowledge is public. This situation would lead to chronic underinvestment in the creation of knowledge, or in other words, markets would fail to produce it in socially optimal quantities. The economic problem to be tackled is that since competitive markets do not create the optimum level of invention and creativity, what should be done to promote the generation of new works. Economists wrestle with the question of how to finance the creation of new knowledge, particularly when private investment is involved [19].

Patents, copyright and other such IPRs constitute one way for the originator of a protectable work to restrict its use, reproduction and distribution for a certain period of time upon the fulfilment of certain conditions. This helps originators appropriate for themselves at least part of the social benefit of their creations. In theory, this set of IPRs gives the originator of a work some market power to set its price above the cost of production. How far above cost the price can be set depends on how much market power is enjoyed by the originator, which in turn depends primarily on the price and availability of close substitutes. The higher the availability of substitutes, and the closer the degree of substitutability, the greater the competition in the specific market for the work, and the lower is the market power of the IP owner and vice versa. Even so economists term such IPRs as providing a "second-best" solution, because such market power creates "deadweight" losses to consumers, i.e. reduces the gains to consumers, thus reducing societal

welfare from the optimal levels obtained under perfect competition [19].

Where markets function efficiently and new ideas are scarce, patents offer certain advantages over other types of incentives such as direct financial transfers. Decisions on the type of new works to be rewarded are decentralized and there is a direct relationship between those who benefit and those who pay, unlike when tax revenues are used to directly commission or reward new works. Further, while patents may increase costs to society in the short run or in a static sense, they could lead to dynamic benefits in terms of leading to more innovation in the long run than a situation where there are no patents. Beneficial competition could result where there are effective ways of inventing around the patented invention [19].

The requirement to disclose the invention fully in patent claims helps disseminate a vast amount of scientific and technical information that could otherwise have been kept secret. Society thus benefits from research conducted by those "standing on the shoulders of giants" to create further new and useful inventions. However, sometimes this could lead to patent thickets or patents that block follow-on innovation that in turn results in society underutilizing this pool of knowledge or known inventions, leading to what has been characterized as the "tragedy of the anti-commons" — a constraint on researchers seeking to develop useful technologies from a shared body of background knowledge. This has, in particular, been cited as a problem in the case of biotechnological inventions, in particular those that are used as research tools [19].

Patents also have transactional value as they are useful instruments in obtaining finance (venture capital), or in agreeing to licences. Patents often form the basis of different forms of contracts relating to technology transfer or technology sharing arrangements, including patent pools [19].

IPRs that aim to correct information asymmetries

Turning to the second set of IPRs that aim to correct information asymmetries, trademarks and geographical indications are meant to correct the imbalance between buyers and sellers in the information that they possess on the quality or other characteristics of particular product on the market [19].

Markets fail when there is no way to reliably signal the quality of a product. For example, in the market for used cars, it can be relatively easy for a used car salesman to sell his client a "lemon" or a bad quality car. It is for this reason that high quality used cars may not obtain the "correct price" and may exit the market. In this case of market failure both consumers and society are worse off (WIPR, 2013). There are many ways of correcting such information asymmetries, for example by guarantees, but also using trademarks (Akerlof, 1970) [19].

Trademarks work better to help consumers assess quality when the goods are not what Phillip Nelson calls "search" goods, for which the quality is readily discernible (for example, red and firm tomatoes), but are "experience" goods, where the consumer has to purchase the product to know its attributes, e.g., canned fish (Nelson, 1970). Brand advertising expenditures are consequently higher for experience goods than for search goods (Nelson, 1974) [19].

Trademark law, which evolved from the common law doctrines of passing off and unfair competition, prohibits others from using confusingly similar trademarks in a way that misleads the consumer as to the true origin of the goods or services. In common law jurisdictions, trademark rights accrue to those who are the first to use their distinctive mark in the marketplace. When enforced properly, trademarks save consumers "search" and "experience" costs and thus benefit them. This law also benefits producers as they have the incentive to build up their reputation and invest in high quality since otherwise consumers could "retaliate" by shunning the brand. Trademarks help recoup such investment because others cannot "free ride" by using the same or similar marks. Trademark law also supports franchising which can result in the mark being used over vast geographical spreads rapidly [19].

Well-known trademarks have a higher level of protection in that, once registered in the jurisdiction, others can be prevented from using them even on dissimilar goods and services in that jurisdiction, even though there is lesser likelihood of confusion. Here the producer suffers losses due to the dilution of the mark, which weakens the association between the mark and the product in question. This is especially true for what could be termed as "Giffen goods", where the higher the price the higher the demand for the product. For example, while the person who buys an imitation of an expensive watch may be fully aware that it is an imitation, consumers may no longer wish to buy the genuine product as it is not so rare anymore. In the TRIPS Agreement, geographical indications for wines and spirits must be accorded additional protection by prohibiting the use of accompanying epithets such as "kind", "type", "style" or "imitation", even where the true origin of the product is clear [19].

Geographical indications

Europeans want their food names back

IN 1925 Ron Buholzer's family left Switzerland and settled in lush, green, rural Wisconsin. Here, like so many Wisconsinites, his family started to make cheese. Since then four generations of cheesemakers have worked in the family firm. Their most popular product is feta, a crumbly cheese that goes well in Greek salads. Mr Buholzer worries that he may soon be banned from selling it, because the EU is trying to "claw back" food names that Americans consider generic but which Europeans believe should only apply to products made in specific bits of their continent. That includes feta, Parmesan and maybe even bologna [20].

Already Mr Buholzer is barred from exporting his feta to South Korea if he calls it "feta". Also, any new feta products sold in Canada that are not from Greece will soon have to be called "like" or in the "style" of feta—and not use Greek symbols. The EU is demanding protection for 145 food names, including feta, asiago, Gorgonzola, munster and fontina [20].

US cheesemakers are unwilling to accept this as a feta accompli. On the contrary, they are preparing for a food fight. A group has sprung up to fight the European threat: the Consortium for Common Food Names. Negotiations over the Transatlantic Trade and Investment Partnership, a proposed free-trade deal between the EU and America, may stumble over the issue. The EU, meanwhile, is leaning on governments everywhere to stamp on foodmakers who purloin European names [20].

Americans are unimpressed. They see all this as an attempt to erect trade barriers and raise prices by reclaiming words that have long since passed into general use. Many members of Congress have urged Barack Obama's administration to resist the Europeans' demands. Some will use this as an excuse not to ratify a trade deal unless the EU gives way [20].

The US does offer legal protection for foods from geographic regions under trademark law. For example,

Parmigiano Reggiano cannot be called that unless it really comes from the right parts of Italy. Likewise, Americans may call fizzy wine from California "champagne", but that is not what it says on the bottle (though one vineyard won an exception). There is no easy way to determine which names deserve protection. Are French fries safe? Or Italian dressing? Or even that symbol of American pride, the hamburger [20]?

While trademarks do not generally block entry into a market of other identical products with different marks, trademarks that take away descriptive terms from the public domain could obstruct fair competition by forcing potential rival companies to incur higher marketing costs in making the description or essential attributes of their products known to the consumer. Trademark law uses certain policy levers to balance the costs to society. The distinctiveness-acquired through-use doctrine for descriptive or geographical terms prevents unwarranted obstruction of competition. Similarly the requirement to use trademarks within a certain period after their registration (at least three years, according to the TRIPS Agreement) prevents the accumulation of fanciful or other distinctive signs for purposes of sale to others rather than use in the market place by the owner. The term of protection is not a policy lever in the case of marks because as long as the mark serves to distinguish the source of the product or service, it serves its essential function in society and so there is no problem with a unlimited term of protection, although trademark laws typically require periodic renewal against a fee to deter traders from maintaining registrations of marks without using them. If trademarks become generic in that they are used as descriptive terms, they fall into the public domain, as has happened with Escalator and Zipper. Many trademark laws allow for registrations to be cancelled when a mark has ceased to be distinctive. Hence trademark owners may have to actively prevent their trademarks from entering into common descriptive usage. Trademark owners can always abandon their marks by simply not renewing their registration or ceasing to use the mark [19].

The expansion of trademarks to shapes and colours of packaging (trade dress), musical compositions, and smells has begun to blur the lines between time-limited design-protected and copyrighted works and trademarks [19].

A relevant question that strikes at the very underlying logic of the WTO rules is why should IP standards be enforced but not standards for labour and the environment?

TRIPs tries to enforce minimum IP standards. If Thailand, say, fails to stamp out counterfeit Louis Vuitton handbags and pirated Viagra, France and the US can seek WTO approval to retaliate by imposing trade sanctions [21].

This seems to set an unfortunate precedent – outlawing products violating copyright law is not very different from banning goods made by children or shrimp caught in ways that harm endangered sea-turtles. But enforcing minimum IP standards or environmental and labour standards raises three more questions. Do the costs of differing national standards—trade distortions, cross-border side-effects and policy co-ordination failures—outweigh the benefits of local rules which reflect local tastes and specific conditions? If international standards are preferable, are they effectively enforced with trade sanctions? Would enforcing standards complement the WTO's task of keeping global trade free [21]?

First, differing labour standards are hardly trade-distorting. That Mexican workers enjoy less generous rights than their US counterparts, and that this encourages labour-intensive factories to move south is a gain from trade, not a distortion. In practice there is little evidence this is what happened. Evidence of cross-border side-effects is also weak. Studies fail to substantiate claims that weak labour standards in poor countries depress wages in rich countries. It is also argued that child labour imposes emotional costs on rich-country consumers who find this offensive, which is another cross-border side-effect. If so, it would be better to send aid to the children rather than impose harmful trade sanctions. To ban exports made with by child labour, could leave children unemployed or in unregulated sectors such as prostitution. Nor does a trade sanction on a poor country employing child labour help the WTO's aim of promoting free trade [21].

The case for some environmental standards is stronger. Many environmental problems, such as global warming, cross national borders. Governments tend to neglect the costs of externalities when setting domestic regulations. A country that fails to limit overfishing causes all to suffer as a result. Even if some do impose limits, they might not reap a benefit if others continue to overfish. So, there is a strong case for international agreement. However, it is debatable whether such agreements should be enforced with trade sanctions. They are a blunt tool and may be ineffective (even if they appear the only option short of war). Anyway, it is hard to see why such matters belong at the WTO, since these are mainly disputes about the environment, not trade [21].

Keith Maskus[10] of the University of Colorado argues that the case for WTO enforcing IP standards is strongest. Weak standards can harm trade. If pirated Madonna CDs sell in Hong Kong, sales of the genuine article are displaced. Weak IP rules can discourage foreign investment and technology-licensing, and a country can free ride on research-and-development spending done elsewhere. If many countries do this, little innovation takes place. International standards help overcome such problems. Trade sanctions are fairly useful for enforcing IP standards because the commercial damage imposed by illegal copying can be assessed relatively easily. Enforcing IP standards is more an issue for the World Intellectual Property Organisation (WIPO), even though it does fit well with the WTO because it improves market access for copyrighted goods. However, raising IP standards is fundamentally different from lowering trade barriers – with trade liberalisation all countries gain [21].

The economics turns on the difference between IP and tangible property. Tangible property is "rivalrous in consumption"—if Tom eats this sandwich, Mary cannot. However, property rights are assigned, only one sandwich can be eaten. IP, in contrast, is non-rivalrous. If Tom listens to this song, there is no reason why Mary, Harry and others should not listen to it as well—in effect at zero additional cost, given technologies of duplication and distribution. If assigning property rights excludes some would-be consumers, the result is waste – unsatisfied demand even at no marginal cost. Economics abhors waste [21].

In a static economy, with fixed outputs, there are good reasons for defining and enforcing strong rights in tangible property. An absence of rights could cause war. Property rights make it possible for the economy to allocate scarce resources (scarce because they are rivalrous in consumption) to their highest-value uses. If the economy were static, there would be no such justification for IP rights. There would be no need to ration ideas by price, since they already exist and cost nothing to replicate. There would be no need to worry about allocating them to their best uses, because the economy can reproduce them at no cost, without limit, for any use, however small its value [21].

The case for IPRs rests on the fact that the economy is not static. In the real, dynamic, world, producers of ideas

[10] "Regulatory Standards in the WTO: Comparing IP Rights with Competition Policy, Environmental Protection and Core Labour Standards". Institute for International Economics, January 2000.

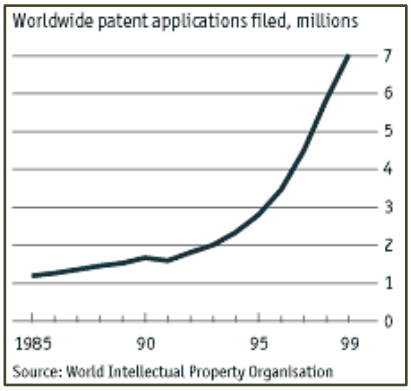
respond to incentives: if rights to a creation are not granted, less will be created, or nothing at all. The stronger the right, the greater their incentive to create, and the bigger the static waste by denying would-be consumers copies that can be produced at no cost. Deciding how strong to make IPRs involves balancing conflicting aims, which is case by case [21].

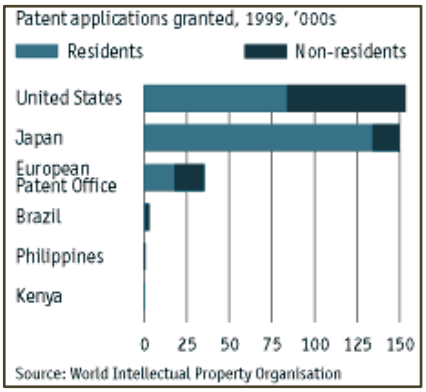
The higher the costs of creating new IP, the more important the incentive effects of strong property rights: without them, the initial outlay could not be recovered. If the world wants new drugs, or new big-budget movies, it will need to protect the creators' rights. When it comes to pop music, the issue is less clear. The costs of creating music are low (excluding marketing and fees to performers and composers, by-products of the existing property-rights regime). Stars could still get rich through live performances (rivalrous in consumption) even if their music were free on the Internet. Napster, an online music-sharing (i.e., copying and distributing) firm, was breaking the law; on economic arguments, it was probably serving the public interest [21].

An unwarranted presumption that IPRs should, as a matter of justice, be as strong as possible leads thinking astray about trade and development. Raising IP protection in poor countries to rich-country levels may do more harm than good. Suppose they were obliged to extend a patent's life from five years to 20. They would suffer inefficiency of monopoly pricing for longer, and would transfer more in patent fees to the rich. What of the benefits to the world? It is hard to argue that Microsoft will stop producing new software and Merck anti-AIDS drugs if, say, Burkina Faso did not enforce its patents. There could be efficiency loss in a poor country with no corresponding gain in rich ones. Stronger IP protection in poor countries do create better incentives for local development of new ideas and potential long-term gains, and evidence suggests that inflows of foreign direct investment rise. But governments of poor countries are having to co-operate in a redistribution of income costing them hundreds of millions of dollars[11] [21].

On the other side, in Mexico, local musicians find it hard to sign contracts with international record companies, since almost two-thirds of the cassettes and CDs sold in the country are pirated. In India, biotech entrepreneurs are busy trying to export products but are wary of commercialising them at home. Since Indian patent law does not fully cover pharmaceuticals, the fruits of their costly research are hard to protect from copycats. By this token, IP protection is good for poor countries. It supports domestic industry, boosts foreign investment and improves access to new technology. IP protection is part of the gospel of modern economic growth, along with free trade and democracy [22].

These two conflicting views turned IPRs into one of the most contentious areas in international development. The debate was sharpened by two relatively new forces. The first is increased interest in the "knowledge economy", in which a company's chief assets are not so much physical capital as bright ideas and the IPRs which control their exploitation and give the firm a competitive advantage. Some patentable innovations, such as "one-click" business methods, challenge conventional ideas of invention. Other advances, such as genetically modified organisms, not only tilt at that standard, but also raise tricky questions about the ethics of laying claim to living things. Between them, however, such developments have led to a surge in patent applications (see chart patent applications filed and granted) [22].





Concerns with Multilateral IP Rules and Protection

The WTO would say that IPRs are not just for the rich. Carefully constructed, they can help the poorest. However, the simple message of AIDS activists in South Africa in 2001 was that "PATENTS kill!" Government and multinational drug companies fought over relaxing of patent restrictions which, it was hoped, would improve the flow of costly medicines to the country's 5m HIV sufferers. In Mexico, poor farmers were furious over a patent issued to a US company giving it exclusive rights to market yellow enola beans in the US. The Mexicans say the bean, grown by them for generations, is not a novel invention, and that the patent unfairly restricts their ability to export it to the US [22].

Are patents bad for poor countries as activists argue? They are the preserve of western multinational companies (MNCs), allowing them to establish monopolies, drive out local competition, divert research and development away from the needs of poor countries and force up the price of everything from seeds to software. In the process, patents prevent poor people from getting life-saving drugs, interfere with age-old farming practices and allow foreign "pirates" to raid local resources, such as medicinal plants, without getting permission or paying compensation [22].

The second force is globalisation. IPRs used to be largely a domestic issue, with countries deciding on their own levels of legal protection and enforcement. The WTO changed all that. As part of the trade deal hammered out in 1995, countries joining the WTO also signed on to TRIPs, setting out minimum standards for the legal IP protection [22].

Many poor countries think that TRIPs is a raw deal. Rashid Kaukab, of the South Centre in Geneva, explained that they feel committed them to the heavy expense of bringing their legal protections and enforcement up to western levels without the benefits claimed for it. As with other WTO rules, TRIPs became a battleground between those who favour, and those opposing, the spread of global capitalism [22].

Contrary to popular misconception, TRIPs does not create a single, universal patent system. Much to their annoyance, MNCs seeking protection round the world still depend on each country's patent office to grant those rights and their judicial, customs and police services to enforce them, although EU countries, for example, have got together to offer region-wide patents [22].

TRIPs does lay down a long list of ground-rules describing the protection these systems must provide. These include extending IPRs to include computer programs, integrated circuits, plant varieties and pharmaceuticals, which were unprotected in most developing countries before TRIPs. Patents can be granted for any technological process or

[11] Keith Maskus, Institute for International Economics, "Intellectual Property Rights in the Global Economy".

product, so long as it is new, inventive and has an industrial application; such protection lasts 20 years from the date of application. Patent rights are valid no matter whether the products are imported or locally produced, and protection and enforcement must be extended equally to all patent-holders, foreign or domestic [22].

Compliance with TRIPs is linked to the degree of a country's economic development. The US Patent and Trademark Office has an annual budget of $1 billion and a staff of more than 3,000 highly-trained scientists, engineers and legal experts to examine claims. More than 600 judges preside over patent disputes, an extensive antitrust authority is on the lookout for monopolies and a vast customs service to clamp down on counterfeiting. At best, least-developed countries have six patent examiners and not much else [22].

Graham Dutfield, at the Oxford Centre for the Environment, Ethics and Society, noted that countries tend to clamour for strong patents only once they have an industry to protect. For most of the 19th century, Switzerland had no patent system at all. Once its industrial base was mature enough to foster home-grown innovation, patent enforcement became a matter of urgent self-interest. TRIPs does not now allow a country to move at its own pace. Most poor countries had until January 2000 to bring their legal protection into line with WTO rules; the least-developed until the end of 2005 [22].

Keith Maskus, an economist at the University of Colorado, reckons that in 2001 it cost a poor country roughly $1.5m-2m just to build a bare-bones infrastructure to implement TRIPs. The World Intellectual Property Organisation gives technical assistance to countries drafting IP legislation or setting up a patent office, but poor countries argue more money and skilled manpower is needed. A country fighting infectious disease or civil war would rather deal with these than patents [22].

As with other trade-related squabbles, countries that considered themselves injured by another's failure to comply can take their grievance to a WTO dispute-settlement panel. There are other means of persuasion, too. The office of the US Trade Representative has a special procedure for investigating countries whose legal protections do not comply, and reserves the right to take action against them. The US busied itself signing trade agreements with countries such as Jordan, which included a requirement for higher standards than TRIPs demands, a practice the EU also follows [22].

In theory, such mechanisms should serve both rich and poor alike, but TRIPs is essentially a set of rich-world conventions that included a few concessions to poor countries. It was pushed on to the trade agenda by the US, EU and Japan, which together hold the lion's share of the world's patents and whose companies wanted more protection abroad. The US pharmaceutical industry, for example, estimated it lost $500m in 2001 in India alone each year because of poor patent protection. The rich world certainly does well out of stronger protection abroad: the US, for example, earned $36 billion in royalties in 1998 from patent licences and the like [22].

A former trade negotiator for India and IP expert at the WTO recalls that developing countries went along with TRIPs in the hope of winning trade concessions in farming and textiles. Such indirect gains have yet to materialise. Some countries would like to see TRIPs taken out of the WTO altogether. But most see a virtue in keeping it in the hothouse of world trade and using it as a bargaining chip with industrialised countries [22].

Meanwhile, the world's poorest countries still wait for the promised benefits of stronger patent protection at home. But inflow of foreign direct investment, technology transfer and home-grown innovation also depend on other things, including market size and competition policy. More advanced developing countries, such as India, may see such rewards eventually. In the short term, however, a stronger patent regime will mean higher prices for goods and more unemployment once copycats are driven from the market [22].

The poor world's anxiety over TRIPs focusses mostly on two issues: access to medicines and protection of traditional resources. Among others, India and a clutch of sub-Saharan states, want clarification of the agreement's provisions and exceptions to protect public health and the environment, and amendment of its articles on the patenting of life-forms. The US and Japan oppose any change in the letter of the agreement; the EU may be more accommodating [22].

• **Drugs** the debate over the impact of IPR on the poor centred on the issue of access to expensive medicines. Many of the world's least-developed countries have laws which provide patent protection for pharmaceuticals. In practice, few enforce them. Spurred on by a victory in April 2001 against drug companies fighting patent reform in South Africa, developing countries issued a declaration at the WTO meeting in Doha that asserted the primacy of public health over IPR. They resolved that the world's least-developed countries should be given at least until 2016 to introduce patent protection for pharmaceuticals [23].

How to make compulsory licensing (the manufacture and marketing of a patented drug without the patent-holder's consent) work for the poorest. TRIPS already permits compulsory licensing under certain conditions, including national emergencies. This is fine for countries such as Brazil, which have domestic drug industries to copy the medicines. Brazil has, indeed, used the threat of compulsory licensing to wring price discounts out of drug companies. The problem is what to do with countries which have no drug makers [23].

Patents have been blamed for the gap between rich and poor countries in their supply of high-tech medicines. Oxfam, an international aid charity, launched a campaign to improve poor countries' access to such drugs with a call for a wide reform of TRIPs. Yet some developing countries, such as Brazil, concede that the agreement is flexible enough in theory, giving them sufficient room to craft their domestic patent legislation in a way that also protects public health. They want to ensure that developed countries interpret the provisions in the same generous light [22].

Many of the most effective drugs to treat such scourges as HIV and malaria are covered by patents in the industrialised world. These allow the developers to recoup their steep research spending, but also drive the cost of the drugs far higher than poor countries can afford. In much of the least-developed world, however, these patents do not apply. In theory, these countries could import generic copies from other poor countries that have the capacity to churn them out, such as India. In practice they do not, largely because they lack both the money to buy the drugs even at bargain-basement prices, and health-care systems to deliver them [22].

There is, however, a group of developing countries, such as South Africa, that are expected to toe the line and enforce such drug patents, but find it hard to pay the sort of prices pharmaceutical companies have, until recently, been asking. The TRIPs Agreement offers two main options to ease their way. The first, called "compulsory licensing", allows countries either to manufacture or import copies of a drug without the patent-holder's approval, in some circumstances—a national emergency, for example—provided that they fulfil certain conditions, such as paying the patent-holder compensation. The second possible fix is parallel importing, which allows countries to seek cheaper

sources of a patented drug from abroad. Drug companies hate this practice, but TRIPs has nothing to say against it [22].

Rich as well as poor countries are worried about the effect of patents on drug prices. They are equally concerned about the patenting of plants, animals and genes. Part of this is a moral objection to the exclusive exploitation of living things. But poor countries also have practical objections. The developing world, home to a rich array of the world's plants, animals and micro-organisms, is a potential treasure trove of starting material for new drugs and crops, which could do the poor much good. But few people in, say, Andean or Indonesian villages have the $20,000 needed to obtain a US patent, or the $1.5m it costs to challenge one [22].

• Traditional knowledge The most glaring conflict between rich and poor over intellectual property comes from the misappropriation of "traditional knowledge"—such as ancient herbal remedies that find their way into high-priced western pharmaceuticals without the consent of, or compensation to, the people who have used them for generations. Often, patent examiners are simply unaware that the plant variety which an enterprising businessman is trying to patent has been used for centuries by a tribal community half a world away. The commission recommends that countries create databases to catalogue such traditional knowledge (India is already doing so), and urges that consulting such databases should be made a mandatory part of patent examinations the world over [23].

Kamal Puri, a lawyer at the University of Queensland, Australia, argues that new systems of IPR protection are needed for traditional knowledge. That is because its communal ownership, uncertain date of creation and unwritten form does not fit the requirements of western systems of IPR. A model law, drafted by Dr Puri and co-sponsored by UNESCO, gives traditional users jurisdiction over native knowledge, and requires that those who wish to commercialise it must seek the users' consent. All transactions must be registered with a tribal authority, which will deal with subsequent disputes [23].

Money is little object, however, to many western entrepreneurs who venture to far-flung parts, bring home such riches and then proceed to patent them. Some of these patents will be warranted, since the "bioprospectors" will have enhanced nature with some inventive step. But ActionAid, a British charity, and other NGOs have documented dozens of instances where nature is left pretty much unadorned and a patent is issued anyway, without any acknowledgment or reward for the villagers who may have tipped off the "inventor" in the first place [22].

A growing alliance of developing countries would like to see this "biopiracy" stopped. Costa Rica, for example, has laws exempting genes from patenting. Others are introducing laws that would require all those applying for IPRs over, say, a plant variety, to declare where they got it and to prove that they not only have the consent of its native users, but have arranged to share the eventual rewards of commercialisation. Brazil and others would like to see such provisions explicitly written into TRIPs. The US is strongly opposed to any change [22].

As the fuss over biopiracy shows, poor countries are not opposed to a proper patent regime; they simply want one that fits their needs. A few interesting experiments are in progress. The Honey Bee network, run by the Society for Research and Initiatives for Sustainable Technologies and Institutions (SRISTI), sends out volunteers into rural India to find village "oddballs", those who are known for working in a different way from others. The volunteers document their ideas or early inventions, such as a motorcycle-powered plough or a tilting manure cart, in a multi-language database, and includes pictures to help illiterate farmers understand the gist of the invention. In 2001 the network had 10,000 innovations on its database, with eight patents pending, and has also benefited from a micro-venture-capital fund to help get the inventions off the ground [22].

A project in Venezuela features Otro Futuro, a local charity, and the Policy Sciences Centre of New Haven, Connecticut, working jointly to help the Indians of the Dhekuana tribe to assemble their traditional myths, music, knowledge of medicinal plants and other traditional folklore into an atlas. A written record is a valuable precaution against a sudden loss of this largely oral heritage, but also serves as a safeguard against piracy abroad. The US Patent Office, for example, will not grant a patent on an invention if there is "prior art", or earlier evidence of its existence in the public domain. But, unlike its European counterpart, the US office does not recognise foreign oral evidence as prior art [22].

Western patent systems grew out of a model of innovation at a particular time in history. They assign specific rights to individuals or corporate entities for well-defined developments for prescribed periods of time. This model does not fit neatly with the sort of collective ownership that some tribal cultures might have, where the "invention" is vague and its origins are lost in the mists of time. New models are needed to protect traditional knowledge. Their introduction would help to turn the rising tide against TRIPs by showing the poorest developing countries that IPRs can be an opportunity, not just a threat [22].

Although many poor countries feel that TRIPS gave them a raw deal—all cost and scant benefits—few want to see the agreement dismembered or removed from the WTO, according to Rashid Kaukab, at the South Centre, a think-tank based in Geneva. That is largely for fear of what might take its place. Instead, a few developing countries, such as India and Brazil, started to flex their muscles when it comes to the battle between western standards of IPR protection and matters of public interest, such as health and farming [23].

Another important area in IPRs is:

• Education and research Alan Story, a specialist in IPR at the University of Kent, in the UK, reckons that copyright, particularly as it pertains to education and research, will be the next big battleground. Those countries that have signed up to TRIPS have also accepted international copyright rules. Although these allow some unauthorised copying for "fair use" or personal consumption for education or research, the commission worries that these exceptions are too limited, and that copyright may hamper access to textbooks, journals and other educational material in poor countries, by requiring the consent of, and likely payment to, the publisher prior to copying [23].

A bigger worry is the Internet, which has great potential for broadening access to education in poor countries, but in which encryption technologies can override the principle of fair use. Some publications, such as the *British Medical Journal*, allow free online access for people in poor countries. More of this would be useful. A recommendation is for developing countries to allow users to sneak round technical barriers such as encryption, to gain access for fair use. Software makers are less enthusiastic [23].

Even when armed with these weapons, poor countries will have a hard time deploying them. Drafting IPR legislation and setting up a patent office that has modern information-technology systems and trained examiners does not come cheap or easy. Neither does establishing judicial, customs and competition authorities, and police services to enforce IPR rules [23].

Despite the acknowledged problems and potential fixes, some still argue that the system does not work. Increasingly patent systems are being found wanting, even as the number of applications soars at patent offices around the world. The US patent system is "sand rather than lubricant in the wheels of US progress", argued Adam Jaffe and Josh Lerner in 2007.[12] The world's patent system remains splintered along national lines, yet the system's defects are felt everywhere. "Patent offices are under incredible pressure," says Dominique Guellec, chief economist at the European Patent Office. Applications at many patent offices have doubled in ten years, and the average length of a submission has increased by 50%. The average quantity of work required to examine an application is three times greater than it was a decade ago. "Of course that can't be neutral in terms of quality," says Mr Guellec [24].

In the US, several controversial business-method patent awards, notably Amazon's one-click payment process, have fuelled the perception that the US Patent and Trademark Office (PTO) is under strain. A study by M-CAM, an IP consultancy, found that over 30% of patents make duplicate claims, raising questions about their validity [24].

In the 2000s, patent applications at US PTO grew at around 6% a year. A decision takes, on average, 27 months—and longer for complex applications in advanced sciences. In 2003, the PTO received 350,000 applications and had a backlog of over half a million to review. It is a global concern because foreigners account for around half of all US patents granted. Similar growth is occurring elsewhere. Applications to China's patent office increased fivefold from 1991 to 2001. As China, South Korea and India spend more on research and development, they start filing more patents [24].

The debate about US patents focuses on the process of examining applications and the difficulty of challenging dubious patents. Patent examiners typically know less about an invention than the applicant. Their workload is far higher for rejecting than granting an application, a perverse incentive for examiners to "dispose" of applications by granting rather than rejecting them. To resolve this, Jaffe and Lerner call for a pre-grant notice period when third parties can come forward with "prior art" that would invalidate the patent [24].

The scope of patents has broadened to encompass new technologies, as well as software, and in some instances business methods. Meanwhile, the legal power of patents, once awarded, has increased, and they are more zealously sought. This, combined with an alleged decline in the quality of patents—that is, how accurate their claims are and whether they are truly novel or non-obvious—is deeply troubling, because an awarded patent is hard to revoke [24].

The mission creep of the US patent system into more contentious areas is spreading elsewhere. The European Council of Ministers have discussed harmonising policy on computer-implemented innovations. Many small software companies in Europe, as well as "open-source" software developers that make non-proprietary software, oppose the initiative. They fear that it is a first step towards adopting controversial software patents, already awarded in the US, which could block different implementations of the same features. The mighty software monopolist, Microsoft's former chairman Bill Gates, once called on employees to increase the number of patents that the company files [24].

The rising importance of patents has led both to an arms race and a game of bluff. Many firms in the information-technology and life-sciences industries say they have an incentive to obtain as many patents as possible to use as bargaining chips in litigation. Whereas a drug patent covers one independent product, a technology patent typically covers a building block of a product, such as the look of the icons on a touch screen, to cite one of Apple's complaints against Samsung. By patenting such building blocks, tech groups prevent rivals from using yesterday's invention to create tomorrow's improved ones. Rather than spurring progress, the patent can trip it up. Patents are also used to reach a cross-licensing agreements, usually with some cash thrown in, so that both firms can continue to do business. Those firms that lack patents are thus disadvantaged [24].

This problem has reach epidemic proportions in the tech industry. In 2005, 41 companies claimed 8,000 patents associated with 3G communications technology. Other standards, such as MP3 music, are similarly surrounded by thickets of competing claims. When not patenting building blocks, tech groups seek patents that are deliberately low-profile in hopes that deep-pocketed companies will violate them unknowingly, at which point patent holders pounce. US companies spent $29bn fending off raids from "non-practising entities", also known as patent trolls, litigators who own bundles of patents with no intention of using them to build products [25].

In 2012 the US courts allowed Apple to extract $1bn from Samsung in compensation for alleged theft of its IP. While acknowledging that Americans worship property rights, others argue that these rights have been unreasonably extended to IP, conflating "rival" goods like homes and hamburgers, which cannot be shared costlessly, with "non-rival" intellectual products that can be enjoyed by all simultaneously. Likewise, Americans worship innovation and presume that IP rights always promote it. This presumption is wrong [25]. Suzanne Scotchmer argues that inventions that would otherwise go into the public domain because they are funded by taxpayers or charities become "cordoned off" by the patent system[13] [24].

The poster child for patents is the pharmaceuticals industry as Richard Posner, a federal appeals court judge, argues, but what works in that sector is not necessarily appropriate in communications or software. Bringing a new drug to market is expensive because of the need for large clinical trials. Monopoly rights over new drugs provide a needed spur to invention. If a trial took as long as a decade, the 20-year exclusivity granted might mean only 10 years of monopoly profits [25].

The technology industry is different. No clinical trials are need, so costs of development are lower and the case for monopoly weaker. So, a 20-year exclusivity is not justified. The right policy for Silicon Valley might be to grant no patents. Technology innovators are rewarded by the first-mover advantage. In the 16 months between the launch of the iPhone and the appearance of its first Android competitor, Apple shipped more than 5m units. Its share price outperformed the S&P 500 index by 20 percentage points [25].

Countries complained to the WTO and the United Nations World Intellectual Property Organisation (WIPO) that the patent system discriminated against them. In the 2000s, WIPO adopted a "development agenda" to consider IP regimes appropriate to the circumstances of developing countries. This was hailed as a boon for reassessing patent protections on drugs and for open-source software [24][25].

[12] Jaffe, A.B and J. Lerner, *Innovation and Its Discontents: How Our Broken Patent System is Endangering Innovation and Progress, and What to Do About It*, Princeton University Press, Jan 2007.

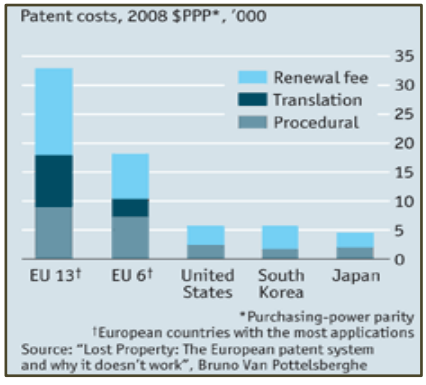
[13] Scotchmer, S., *Innovation and Incentives*, MIT Press, 2004.

Even into the 2000s, Europe's problem was that it suffered from an ineffective system. In 1973, 16 countries signed a convention establishing a European patent so inventions in one country could be protected. Five years later the first applications were filed at the European Patent Office (EPO) in Munich. In 2011, with 38 countries including the EU-27, the EPO received more than 142,000. Yet securing patents across Europe was far from smooth. A single patent providing protection across all or most of Europe did not exist. A "European patent" only meant a basket of national patents that had to be validated, enforced, renewed annually in each country in which the firm wanted protection, and, if necessary, litigated in each jurisdiction separately. So equipped with EPO approval as well as a domestic patent, inventors still had to go from one national patent office to another, translations in hand [26].

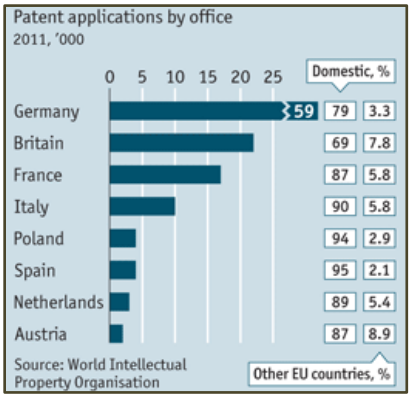
National courts could in effect overturn patents granted by the EPO, or uphold patents which had been invalidated by it. Firms took advantage by filing directly with national patent offices. To illustrate, in 1997 the EPO gave a patent to Massachusetts General Hospital for a treatment. Three companies—America's Air Products, France's Air Liquide and Germany's Westfalen Gas—appealed against the grant of the patent. Mass General and its Swedish licensee, AGA, launched actions for infringement in the Netherlands, France and Germany. In 2000 a Dutch court said the patent was partially valid, in 2003 a French court said its validity was questionable and a German court judged it valid. In 2004 the EPO revoked the patent entirely [27].

Such cases infuriated European firms. They wanted a single European-wide patent to protect intellectual property, and a single court in which to defend their rights. After 40 years, Europe finally had a unified patent system. In December 2012 the European Parliament voted to create a "unitary" patent, approved by the Council of Ministers (EU national governments), which was recognised automatically in 25 EU countries and overseen by a new court, and did away with the need to translate patents into many languages [26].

The EC, the EU's executive body, estimated that the cost of having a patent recognised in every EU country could be €36,000 ($46,900), €23,000 of it accounted for by translation. US patents cost a mere €1,850. In a study by Bruno van Pottelsberghe[14], a senior research fellow at Bruegel, a think tank, noted that it cost 4 to 10 times more for a patent in Europe than in the US, Japan, China or South Korea, depending on how many countries were involved (see chart on costs). Mr Van Pottelsberghe, the EPO's chief economist in 2005-07, noted that duplicate administrative fees added costs but no value [26].



This tariff on inventors may partly explain why national patent offices did not receive many applications from other EU countries (see chart on patent applications). Between 2008 and 2011 filings for European patents fell by about 2.5%—though that probably had more to do with the sickly economy than the sticky system. In the same period, says the World Intellectual Property Organisation, US filings rose by 10%. In 2011, China handled more than any other country, up by two-thirds and replaced the US as leader [26].



The burden fell mostly on small to medium-sized firms. The lack of a unified patent system is one reason why Europe's small and medium-sized technology firms failed to grow as quickly as those in the US, Asia and elsewhere, says the EC. One small firm, Sensaris, a maker of wireless sensors, decided to file under the international Patent Cooperation Treaty, as a way of setting a marker without the expense of a full patent application. Sensaris could not afford the cost to get patents for three or four European countries, says Michael Setton, its founder. "We have decided not to pursue patents in Europe because the system made it effectively impossible for us to defend them," says Fernando Guerrero, a co-founder of a multinational technical consulting firm. Foreign lawsuits are unpredictable and very expensive [27].

Under the new system of unitary patents applications must be in English, French or German, or translated into one of the three. The commission expected the cost of a unitary patent to decrease substantially [26].

Not all are happy. Three owners of fistfuls of patents—BAE Systems, a UK aerospace firm, Nokia, a Finnish mobile-phone maker, and Ericsson, a Swedish telecom-equipment firm—urged the Parliament to reject the plan. They worry that because the new court must apply a patent-owner's domestic law when ruling on infringements, different standards will apply in different cases. Patent "trolls" will choose friendly territory and hold more innovative firms to ransom. Mr. van Pottelsberghe called the patent a great achievement but saw a need for improvement. "[Europe still had] … three layers": national, European and unitary patents. The national offices should cease granting patents and focus on giving advice and other services to applicants [26]. Surrendering a veto over national patents implies a loss of sovereignty. National offices and the EPO knew under a unified process lower costs imply lower revenues. Legal firms and translators also fought harmonization. In some areas, such as genes, software and stem-cell research, the question of what qualifies for protection is controversial [27].

Another concern with IPRs is how some firms are finding ways to extend the lifespan of their patent, at consumers' expense. Drug companies are a good example. It is hard to think of an industry in which competition is more important than pharmaceuticals. As health-care costs rocket, the price cuts—often of 85% or more—that generic drugs offer are one easy way to economise. Ibuprofen is a good example. In the early 1980s the drug, which soothes both pain and inflammation, was a costly patented product [28].

Now it can be bought for just 2.5 pence per pill. In the US, bought in bulk it costs a penny a pop. Indeed, competition from generics is so painful to drugs companies that they

[14] Van Pottelsberghe, B., *Lost Property: The European Patent System and Why It Does Not Work*, Bruegel Blueprint Series, Vol IX, 2009.

have invented a series of ingenious palliatives, exploiting patent laws to help maintain high prices [28].

When a patent reaches its expiry date, the comfortable monopoly evaporates, replaced by cut-throat competition. Incumbents have three ways of defending themselves. Marketing can create brand-specific demand, dulling the temptation to switch to low-priced generic products. Ibuprofen illustrates this. Developed in the 1960s, the patent expired in 1984, but in 1983 the patent holder created Nurofen, a branded ibuprofen. The clever mix of packaging and advertising protected its profits. The lucrative Nurofen brand sells five times more than its generic equivalent [28].

A second strategy nudges customers towards newer drugs that are still protected by patent. Omeprazole, a drug to reduce stomach acid developed by AstraZeneca in the 1980s, shows how it works. Branded as Losec in the UK and Prilosec in the US, it became one of the world's bestselling drugs in the mid-1990s. With the patent set to expire in 2001 AstraZeneca faced a drop in profits. So the company adapted the drug, creating a closely related compound, esomeprazole, which it sold as Nexium. Though a clear offshoot of the original medicine, this counted as a new drug and was given a patent. A big marketing campaign and attractive pricing helped shift demand away from Losec and towards Nexium. With the help of this strategy, sales between 2006 and 2013 amounted to almost $40 billion [28].

This sort of "follow on" patenting is common.Sotiris Vandoros of the London School of Economics looked at what happens when patents expire in two important classes of drugs[15]. He tracked sales of these drugs after patents expired in six European countries between 1991 and 2006, measuring the switch both to generic drugs and to related but still patented compounds. Mr Vandoros's findings are worrying. When patents expired on Captopril, a leading ACE inhibitor, cheap generic versions became available. But the total volume of sales of all versions of the drug went down rather than up as demand shifted to more expensive patented products. Other drugs showed similar patterns, meaning that competition from generics was failing to cut costs [28].

Even more troubling than fending off competition with marketing nous and chemical tinkering is drug companies' third option: pay the makers of generics not to compete. Since the early 2000s "pay for delay" agreements have become more common. A company with a patent due to expire strikes a deal: it pays potential entrants a fee not to compete, preserving its monopoly. A pay-for-delay deal between AstraZeneca and three big generic manufacturers helped to protect Nexium from competition between 2008 and May 2014 [28].

The economic costs of these three strategies vary hugely. Marketing is a decent way to compete. Purists may wish that firms would try to outdo each other by devoting more cash to genuine research and economists may bemoan the irrationality of those who buy branded drugs at ten times the price of an identical generic. But despite the quibbles, the market works: there is a choice, including a low-cost option [28].

Follow-on drugs are a greyer area. Some believe that many are genuinely new inventions, different enough to justify a fresh patent. Big drugmakers' defenders argue that product redesign is a symptom of a healthy and innovative market. Yet the US's competition watchdog, the Federal Trade Commission (FTC), decided that normal rules of thumb do not apply: new products can harm competition in this market. It filed a legal brief to that effect in 2012 regarding Warner Chilcott, a pharmaceutical firm which had reformulated an antibiotic three times. The firm's strategy, which the FTC calls "product hopping", offered little in the way of genuinely new medicine, but helped keep generics out of the market, sustaining a monopoly [28].

If product hopping suggests sickly competition, pay-for-delay deals are a terminal illness. They impose huge, unnecessary costs on consumers: the 40 deals struck in 2012 cover annual drug sales of $8.1 billion; pay-for-delay costs an estimated $3.5 billion a year, according to recent FTC reports. Happily, pay-for-delay may itself be on the verge of losing protection. Ruling by the US Supreme Court in 2013 make it easier to challenge such deals under competition laws [28].

Problems with Enforcement of IP Rules

One may not be able to tell a Gucci from Versace, but one can spot a suspect statistic when it appears. It is easy to raise an eyebrow when a French-based association of luxury goods makers complains in the *Financial Times* in 2006 that fake products cost its members $4.3bn (£3.5bn) a year in lost sales in Japan [29].

The figure turns out to be, if not fake, a bit contrived. It was arrived at by multiplying the estimated unit sales of counterfeit products by the price of genuine ones. The calculation assumed that, if brand-conscious Japanese consumers could not buy pirated copies, they would all buy the real thing. Does anyone really believe that? In fact, international studies have found that the overwhelming majority of sales of counterfeit products are to people who would never have bought genuine ones, because they could not afford them. In China, where incomes are very low, that proportion must be particularly large. So the wages – and the costs – of piratical sin are smaller than they may seem [29].

Some of the retail business that brand owners do forfeit to fakes could arguably be considered long-term marketing investment. Just as owning a Picasso reproduction does not reduce the desire to possess an original, today's buyers of fakes are often tomorrow's eager customers. East Asia is where the fast-growing numbers of newly rich flaunt the symbols of success most ostentatiously. Those who have made it, and some who have not, would never dream of wearing a bogus Rolex watch or Hermes tie. Affluent main-land Chinese shoppers pour into Hong Kong to snap up western luxury goods, when near-indistinguishable knock-offs can be bought for a fraction of the price in China [29].

Luxury goods makers lobby hard to get governments and law-enforcement agencies to step up the fight against piracy. Central to their campaigning is the contention that counterfeit goods are bad, not just for their businesses, but for society as a whole. It is true that fake product sales often escape tax and help fund organised crime. But when producers also insist that their self-interest is identical to that of consumers, scepticism is in order. There is a clear social gain from banning counterfeits that pose health and safety risks, especially when consumers cannot easily identify them. Pharmaceuticals are a case in point, although for cigarette companies to shelter behind the same argument makes nonsense of it. Nobody has died or been maimed by a fake handbag. Most shoppers know that if a product bearing a familiar brand name is unusually cheap, it is unlikely to be authentic. Anyway if a fake is indistinguishable in quality and appearance from the real thing, as some are, where is the consumer harm [29]?

Claims that piracy deters innovation by reducing the incentive to invent can be overstated. It may be true for computers and software – although, even there, Linux and

[15] Vandoros, S. (2013), "Therapeutic Substitution Post-Patent Expiry: The Cases of Ace Inhibitors and Proton Pump Inhibitors", Health Economics, Vol 23(5):621.30.

the growth of "freeware" tell a different story. However, few luxury goods take much research or capital to develop and produce. Those that sell on "heritage" values require almost none. Most of the investment is in advertising and marketing. Of course, producers are upset when pirates cash in, but whether society at large loses is far less clear. One US study has even suggested that, overall, the economic gains may equal or exceed producers' losses [29].

This is not to condone IP violations: free and prosperous economies require private property rights that are clear-cut and effectively enforced – even if producers have sometimes sought unreasonably to expand the limits of the monopolies that those rights confer on them. However, if they want to rally the rest of society to the defence of their interests, they should do so with arguments that are as genuine and reputable as their products [29].

To most people, counterfeiting means forged currency first and foremost. But counterfeiters are copying an ever widening range of products. For some time they have been churning out imitation designer fashion, software and CDs. Now they are copying medicines, mobile phones, food and drink, car parts and even tobacco [30].

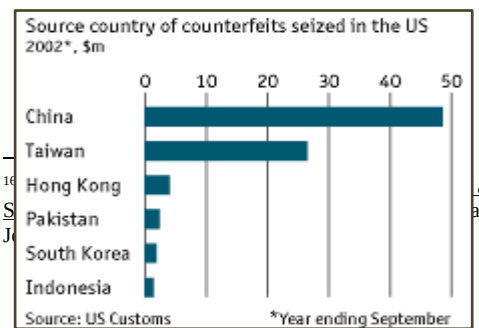
New technology has broadened the range of goods that are vulnerable to copying. It has dramatically improved their quality, as well as lowering their cost of production. Where once counterfeits were cheap and shoddy imitations of the real thing, today their packaging and contents (especially for digital products such as software, music CDs and film DVDs) often render them almost indistinguishable from the genuine article [30].

A counterfeit, on a strict definition, is something that is forged, copied or imitated without the perpetrator having the right to do it, and with the purpose of deceiving or defrauding. Such rights are legally enshrined in patents (linked with inventions), copyright (which covers literary, musical and artistic works, and software), trademarks (which include words, pictures and symbols), industrial designs and other forms of IP protection [30].

Counterfeits come in many shapes and sizes. Mark Turnage, co-author of a new book[16] on counterfeiting, groups them into four broad categories, according to the quality of the product and the level of deception. They range from the cheap look-alike Rolex, bought knowingly by a happy customer, to the counterfeit, sub-standard brakes on an unsuspecting driver's car [30].

In the early 2000s, the international capital of counterfeiting was undoubtedly China. At least $16 billion-worth of goods sold each year inside the country are counterfeit, according to one conservative estimate. Procter & Gamble reckons that 10-15% of its revenues in China were lost each year to counterfeit products. The International Intellectual Property Alliance claims that 90% of musical recordings sold in the country were pirated [31].

Most of China's counterfeit bounty stayed inside the country, but rising quantities were destined for foreign markets—as customs seizures in the US show (see chart, source of counterfeits in the US). This international trade depends on sophisticated distribution networks. Increasingly run by organised-crime syndicates, these used many of the same routes that were established for trade in narcotics [30].



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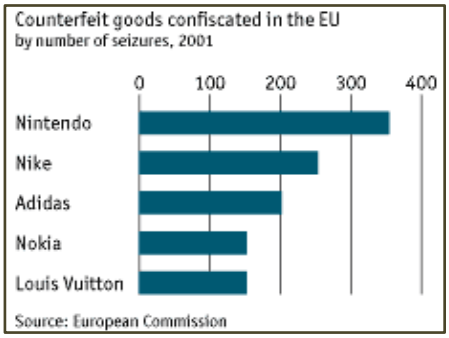
China was by no means the only big exporter of counterfeits in 2003. In its annual “Special 301” review, the Office of the US Trade Representative (USTR) fingered more than 30 countries as counterfeiting and piracy hotspots. Ukraine, for example, was awash in bootleg optical discs; Russia ran on counterfeit software; while Paraguay rolled in imitation cigarettes. The USTR reckoned that US industries lost $200 billion-250 billion a year to counterfeiting [30].

Nor was such activity restricted to poor places. Milan was a leading producer of counterfeit luxury goods and Florida was an international haven for fake aircraft parts. The Counterfeiting Intelligence Bureau (CIB), part of the International Chamber of Commerce, estimated that 7-9% of all world trade was in counterfeits, their path smoothed by the opening of markets. There was no doubt that counterfeiting, like manufacturing, had gone global [30].

Since the 1970s, there was a remarkable rise in the counterfeiting of consumer products. Several factors were behind this. Technological advances took much of the skill out of manufacturing. This allowed big business to move its manufacturing base to poor countries to take advantage of low labour costs. Unfortunately, many of these businesses paid insufficient attention to the sort of IPRs on offer in such places and they paid the price [30].

This migration coincided with the growing popularity (and rocketing value) of brands. Through ingenious marketing, a simple designer label could turn a comfy $10 T-shirt into a $100 object of aspiration. So much of a product's worth is tied up in its brand and intellectual property, rather than its material constituents, that it becomes easy prey for counterfeiters who can exploit consumers' expectations of quality and service without the cost of having to fulfil them (see chart, counterfeit goods confiscated in the EU) [30].



Although MNCs were the loudest complainers about counterfeiting, they were not the only ones to suffer. Because counterfeiters copy popular brands, local firms in counterfeiting hotspots can also lose. In Thailand, domestic firms such as GMM Grammy, which produces movies and music, and Jim Thompson, an upmarket silk producer, saw their Thai sales falter because of counterfeiting. The state tobacco monopoly launched a vigorous campaign to stop counterfeit versions of its Krongthip cigarettes flooding in from abroad [30].

Counterfeiting is as diverse as any legal business, ranging from back-street sweatshops to full-scale factories. Counterfeiters often get their goods by bribing employees in a company with a valuable brand to hand over manufacturing moulds or master discs for them to copy. One of the most infuriating problems for brand owners is when their licensed suppliers and manufacturers “over-run” production lines without permission and then sell the extra goods on the side [30].

Distribution networks can be as simple as a stall in the street, or a shop on the other side of the world. The internet has been a boon to counterfeiters, giving them detailed information about which goods to copy and allowing them

to link consumers and suppliers with ease and relative anonymity. Peter Lowe, head of the CIB, reckons that some $25 billion-worth of counterfeit goods are traded each year over the internet [30].

The complex distribution network required by the larger counterfeiters has attracted organised crime. Interpol is well aware of the connection; last year it established a special working group to improve co-ordination of international action against counterfeiters. Of growing concern to authorities, however, is evidence that terrorists too are in on the act. The 1993 bombing of the World Trade Centre was financed, in part, by sales of counterfeit T-shirts in New York; and the CIB maintains that the IRA has funded some of its activities in recent years through video piracy. The World Customs Organisation is now working on new ways of monitoring and controlling international supply chains. Its explicit aim is to clamp down on smuggling by terrorists; but a happy side-effect may be to cut back on counterfeits too [30].

Fake goods are proliferating

Counterfeiting "used to be a luxury goods problem", says Therese Randazzo, who is in charge of protecting intellectual property at the US's customs service. Now people are trying to traffic counterfeit items that have a "wider effect on the economy", she says, such as pharmaceuticals and computer parts [31].

In 2008 the value of fake goods seized at the US's borders increased by nearly 40% over the year before. It subsequently fell by 4% last year—far less than the 25% decline in imports overall (see chart). In Europe in 2008 customs services confiscated more than double the previous year's haul of counterfeit goods [31].

Businesses, which feel the revenues lost to counterfeiters all the more acutely in a downturn, are making an even greater effort to root out impostors. Complaints from Louis Vuitton, a luxury-goods firm, for example, led to nearly 9,500 seizures of knock-offs last year, 31% more than in 2008. Lawsuits brought by companies against manufacturers and distributors of counterfeits are at an all-time high, says Kirsten Gilbert, a partner at Marks & Clerk Solicitors, a British law firm [31].

The technology used to counter pirates is also becoming more sophisticated. Holograms are a cheap way to distinguish real items from fakes, although counterfeiters are getting better at copying them. Special inks, watermarking, and other "covert" technologies (meaning those invisible to the naked eye) are becoming more popular as a result. Many "brand protection" firms have also started to peddle radio-frequency identification (RFID) technology to help companies track shipments. This allows firms to tag boxes and crates with chips which send out signals identifying them as authentic [31].

Counterfeiting is not a victimless crime. For a start, legitimate businesses lose sales because of competition from counterfeiters. If their brand loses value (because it is seen as less exclusive or is confused with shoddy imitations), this poses a long-term threat to profitability. In addition, firms have to bear the cost of anti-counterfeiting measures. Procter & Gamble reckons that it spends $3m a year fighting the copycats [30].

Another headache is the prospect of legal liability. Last year, Serono, a Swiss biotechnology company, settled a case with two American customers who had sued the firm (and assorted distributors) after taking a fake version of its body-boosting drug Serostim. The plaintiffs claimed that the company should have foreseen the possibility of counterfeits entering the distribution chain and should have taken suitable precautions [30].

A study in 2000 by the Centre for Economics and Business Research estimated that the counterfeiting of clothing, cosmetics, toys, sports equipment and pharmaceuticals within the EU cost the region 17,120 jobs, and reduced GDP by €8 billion ($7.4 billion) a year. As counterfeiters rarely pay duties or taxes, governments lose further revenue. And countries with endemic counterfeiting may sacrifice foreign investment too. Sony, for example, toned down its music operations in Hungary because of counterfeiting. There was, however, little sign that MNCs avoided China: quite the opposite [30].

Given the costs, big business is keen that consumers should feel as strongly about counterfeiting as it does. But most customers, in the developed world at any rate, are relatively unconcerned. Some argue that counterfeiting benefits consumers, particularly in developing countries, by giving them access to lower-price goods, such as software, that they might not otherwise be able to afford. And they claim that counterfeits occasionally push brand-holders into innovating in their customers' interests. Yamaha, for example, has decided to beat China's counterfeiters at their own game by introducing a new model of motorcycle at roughly the same price as the fake Yamahas on the streets [30].

Nevertheless, the costs of counterfeiting far outweigh the benefits. The World Health Organisation reckons that 5-7% of pharmaceuticals worldwide may be counterfeit—with too few active ingredients, too many contaminants, fake labels or recycled packaging that covers up expiry dates. The problem is most acute in developing countries. Three years ago, a survey of shops selling artesunate, an anti-malarial drug, in Cambodia, Laos and Thailand, found that more than a third of the samples analysed had no artesunate in them at all. Even in America, counterfeit medicines are not unknown. Last year, the Food and Drug Administration (FDA) launched some 30 investigations into cases of pharmaceutical counterfeiting, involving such popular brands as Combivir (against HIV) and Procrit (for anaemia) [30].

At least as hazardous is the trade in counterfeit car parts, which may account for as much as 10% of the spare parts sold in the EU, according to a 1999 study. Even more worrying is the thriving trade in reconditioned aircraft components, passed off as genuine parts along with fake certificates of authentication. In 2002, police raided three aviation-parts manufacturers in Rome, seizing more than $2m-worth of used parts—modified and repackaged to look as good as new [30].

Dodgy aircraft parts kill. In 1989, a plane belonging to Partnair, a Norwegian charter airline, crashed when its tail assembly fell off because of substandard counterfeit bolts holding it to the rest of the body. The CIB believes that the November 2001 crash of an American Airlines flight over New York may have been caused by the failure of counterfeit parts [30].

Few big companies are unaffected by counterfeiting somewhere in the world. As Tony Gurka, managing director of Commercial Trademark Services in Hong Kong, notes, "you get corporations saying they don't have problems. Well if they don't, either they have a lousy product or it's being copied so well they don't know about it" [30].

One tack that companies increasingly take is to load their vulnerable products with anti-counterfeiting features. Some of these, borrowed from pioneering security devices developed for use on dollar bills and the like, are clearly visible and are intended to help consumers distinguish fakes from genuine goods. One approach, used by Telesense in Beijing, is to label each item on sale with a unique 16- to 21-digit number. Consumers can confirm that the item is genuine by calling the company. Telesense reckons it has 8 billion numbers in its database and on products throughout China. But such overt anti-counterfeiting features depend on consumers caring enough to make a call. Other devices, such as holograms, are themselves prone to counterfeiting [30].

Companies also use covert features, primarily to help them trace their products through the supply chain and to distinguish genuine articles from fakes, especially should they need to take the copycats to court. Molecular tags (such as DNA) are being used in products or on packaging to mark them in such a way that special assays can distinguish the real thing. And there is a raft of encryption methods to stall, if not stymie, would-be software and digital media pirates [30].

A number of firms have sprung up to provide authenticating technologies. Pira International, a trade organisation, reckons that the markets for these technologies will be growing by more than 10% a year by 2005. But many companies still balk at the cost of some of the more effective technologies, especially in today's economic climate [30].

Bill Thompson, the Shanghai-based managing director of Pinkertons, a private investigation firm, claims that the key to fighting counterfeiting is the four "Es": enforcement, education, external pressure, and economic growth. Once firms get a hint that counterfeits are circulating in a particular market—from, say, unexpected fluctuations in sales or angry consumers—many employ the likes of Mr Thompson to watch the market, collect samples, and co-ordinate raids with the local police [30].

Increasingly, companies are joining together in industry or regional coalitions to deal with the issue. One of the busiest groups is called the Quality Brands Protection Committee. In China, it collects data on the scale of counterfeiting, and lobbies the government for better protection. It also educates police and customs officers on effective enforcement [30].

In the end, though, growth and home-grown invention are the most effective remedies to counterfeiting. In the 1960s, Japan was a hotspot for copying; in the 1970s, that dubious distinction passed to Hong Kong; in the 1980s, it was Taiwan's and South Korea's turn in the spotlight; and since 2000 it was China's. As each of the pioneer countries has developed its own industry, it has introduced laws and penalties to clamp down on counterfeiting. China will, at some point, follow the same route. But no amount of effort will ever completely eradicate the copycats. For as long as there is consumer demand, companies will find that imitation is the severest form of flattery [30].

Case of counterfeit drugs

Those who smuggle counterfeit medicines have often faced lax enforcement and light punishment [33]. No one knows exactly what share of medicines are fake, ill-made, stolen or diverted. It afflicts countries where officials are bribable, health systems lax and consumers desperate. Counterfeit drugs can kill. Many are shoddily made, containing the wrong dose of the active ingredient. Taking them instead of the real thing can turn a treatable disease into a fatal one. It can also foster drug resistance among germs [32].

In Nigeria, Africa's largest market for medicines, a 2011 survey by the World Health Organisation (WHO) found that 64% of antimalarial drugs were fake. Over 70% of drugs consumed in Nigeria are imported from India and China, widely seen as the biggest source of fakes. Paul Orhii, of Nigeria's drug agency, blames "a shambolic system and porous borders". This has been a big problem for a long time in developing countries. Studies of anti-infective treatments in Africa and South-East Asia have found that perhaps 15-30% are fakes. The UN estimates that roughly half of the anti-malarial drugs sold in Africa—worth some $438m a year—are counterfeits [32].

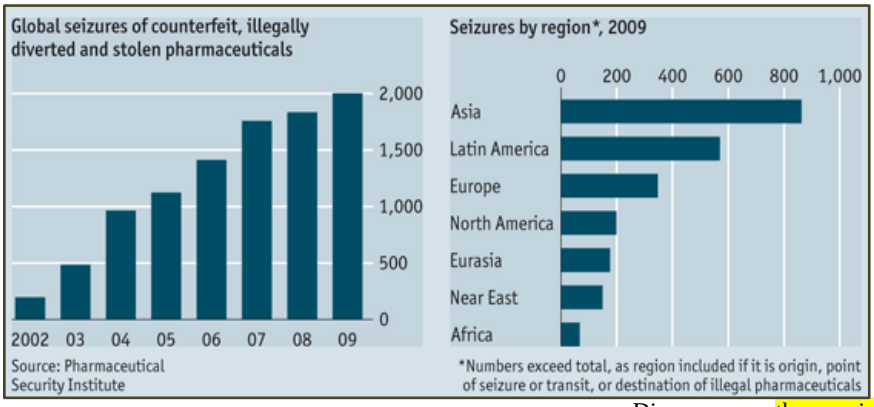
For criminals, fake pharma is lucrative and the penalties are usually low. The drug supply-chain is a cheat's paradise. Raw materials come from one place and are processed into active ingredients in another. Pill-fillers and coating come from other sources. Manufacturing and packaging may be separate. To reach the dispensary, the drug passes through distribution chains (and may be repackaged). In the US 80% of drugs' active ingredients are imported (drug imports there more than doubled from 2002 to 2010, accounting for 40% of finished medicine) [32].

This creates a regulatory nightmare. In the heparin case, Chinese suppliers replaced the main ingredient with a cheaper, dangerous substance that passed authentication tests. Fake Avastin hopped from Turkey to the UK to US, with help from a Canadian online pharmacy. The WHO has a "prequalification" scheme that authorises cheap, good drugs for aid programmes. But Roger Bate of the US think tank, American Enterprise Institute, in a study found that 7% of such drugs in his sample failed. Mr Bate says his field work has convinced him that counterfeits kill at least 100,000 people a year, mostly in the poor world [32].

The pharmaceutical industry persuaded governments to stiffen regulations against fake drugs and to conduct more aggressive raids (see chart, global seizures). An international police campaign against illegal online pharmacies, Operation Pangea, involved 100 countries and shut down more than 18,000 online pill-pushers. But such pharmacies are not necessarily the villains: they often sell real drugs (at low prices); and many fakes are on sale from reputable offline outlets. Some poor countries think that rich ones simply want an excuse to bust their generic drug industries. Rows about the definition of "counterfeit" cripple the WHO's International Medical Products Anti-Counterfeiting Taskforce, or IMPACT, launched in 2006. New working groups are mulling the meaning of SFFC ("spurious/falsely-labelled/falsified/counterfeit") drugs. It may add another "S" for "substandard" [32].

China, concerned for the reputation of its drug-export trade, staged big seizures of fakes (detaining nearly 2,000 people). In 2007 it executed its top drug official for approving untested medicine in exchange for bribes. India has commissioned feasibility studies of track-and-trace technology. Companies are also devising novel technologies to outfox the criminals [32].

Salesmen have peddled worthless cures for millennia, but the 21st century is a golden age for bad drugs because bad pharma is a global problem. Some governments deem drug-counterfeiting a trivial offence. Whose spam filter has not had ads for suspiciously cheap "Viagra"? Viagra topped the list of knock-offs seen by Pfizer, said John Clark, the US drug firm's global head of security; but fake versions of at least 20 of its products (including Lipitor, a blockbuster cholesterol drug) have been detected in the legitimate supply chains of at least 81 countries in January 2009. As of July 2012, 106 countries had found 60 such fakes. Mr Clark's intelligence comes from Pfizer's global network of informants, consumer tip-offs and in-store inspections [32].



Counterfeiters used to operate chiefly in developing countries, says Mr Clark, but now his firm sees fakes coming from such rich and well-regulated places as Canada and Britain. The crooks are growing more technologically sophisticated: some can even counterfeit the holograms on packets that are meant to reassure customers that pills are genuine [33].

A consumer study funded by Pfizer in the early 2010s found that nearly a fifth of Europeans polled in 14 countries had obtained medicines through illicit channels. That, the firm reckoned, made for a grey market in the EU worth over €10 billion ($12.8 billion). Terry Hisey of Deloitte, a consultancy, thinks the global market for fakes could be worth between $75 billion and $200 billion a year. Those staggering sums, he argues, help explain the emergence of a flurry of new technologies and companies hoping to help the drugs industry "secure its global supply chain" [33].

Cases of drug-related patents in India, Brazil and China

Indian patent rules infuriate Big Pharma

India's drug industry has a unique history. For more than 30 years, the country did not recognise pharmaceutical patents. Domestic firms became masters at copying medicine and making it cheaply. India is home to a thriving generics industry, whose copycat drugs make up about 90% of the market. Its government is keen to encourage generics and keep prices down. After joining the WTO in 1995, India had to change its patent policy. Its new system, in place since 2005, includes special protections for both patients and generic manufacturers [34].

The law bars patents of minor changes to existing drugs, a practice known as "evergreening", or follow-on patenting. Drug reformulations are often used to extend patents elsewhere, but get no protection in India. The country also has broad criteria for "compulsory licensing". The TRIPs agreement allows countries, in some cases, to force a firm to license a patented drug to a generic company. India's rules give officials broad powers to do this. Now both provisions are under attack. The cases will help decide how quickly India's 1.2 billion people get new drugs, and at what price [34].

In 2006 India denied Novartis, a Swiss giant, a patent for Glivec, a blockbuster cancer drug, calling it an unpatentable modification of an existing substance, imatinib. Novartis insists this is nonsense. Only by making it in salt form, imatinib mesylate, did Novartis have a proper drug: the body absorbed the medicine 30% more easily. Paul Herrling, the chair of Novartis's Institute for Tropical Diseases, says the case is a test of what is patentable in India. "We are being accused of evergreening," he says. "Having that concept applied to Glivec, which is a major breakthrough in cancer therapies, is completely ridiculous." Michelle Childs of Médecins Sans Frontières, a non-profit, retorts that drug firms such as Novartis should not win patents for minor improvements. This would keep generics off the market, driving up prices [34].

In 2008 Bayer, a German drugmaker, won an Indian patent for Nexavar, a kidney-cancer drug. India's patent controller issued the country's first compulsory licence when it ordered Bayer to license a drug to a local manufacturer Natco. The controller wrote that Bayer had not made Nexavar "reasonably affordable" (Bayer offered it for a whopping $5,000 a month), that the company failed to provide enough of the drug and, in a protectionist nod, reckoned that importing Nexavar further hurt Bayer's case. Natco was instructed to sell Nexavar for one-thirtieth of Bayer's price. Bayer will receive a 6% royalty. Meanwhile Bayer is fending off another competitor, Cipla, which has sold generic Nexavar in India for years [34].

Western drug firms and their legal problems in India, recent cases

Company	Drug	Issue	Now
Bayer	Nexavar *(kidney cancer)*	Patent office ordered Bayer to license its drug to an Indian firm for a song	Bayer's challenge began on Sep 3rd before IPAB*
Bayer	Nexavar *(kidney cancer)*	Sued Cipla, an Indian firm, for patent infringement	Hearing in Dec 2012
Novartis	Glivec *(leukaemia)*	India refused to grant Swiss firm a patent in 2006	Decision challenged. Hearing on Sep 11th 2012
Roche	Tarceva *(cancer)*	Sued Indian companies for infringing its patent	Awaiting decision
Roche	Valcyte *(AIDS)*	Patent office revoked Roche's patent	Appeal pending to IPAB*
Gilead	Viread *(HIV)*	Patent office rejected two patents	Appealed; the case is still pending

Source: *The Economist* *Intellectual Property Appellate Board

Brazil's corruption scandal may deal a blow to intellectual-property rights

When both parties to a negotiation declare victory, it often seems too good to be true—and in the case of a recent deal on AIDS drug prices between the Brazilian government and Abbott Laboratories, a US pharmaceutical firm, it was. In 2005, the two sides announced an end to a stand-off over the cost of Kaletra, Abbott's anti-retroviral treatment. The drug accounts for nearly one-third of Brazil's budget for AIDS medications, which it provides free to HIV-positive citizens. The government had asked Abbott to cut Kaletra's price by 42% or grant a licence for the state to produce it. If not, Brazil threatened, it would disregard Abbott's patent and use a compulsory licensing procedure sanctioned by the WTO to manufacture the pills without the firm's permission [35].

Under the deal, Brazil would maintain its current annual spending level of $109m on Kaletra until 2010. As the number of patients receiving the drug was expected to rise from 23,400 to 60,000, Brazil would pay a much lower average price per pill. Abbott's revenues would not change. Both sides hailed the deal because it would let Brazil greatly expand its AIDS treatment scheme for nothing without hurting the firm's bottom line [35].

The pact barely lasted a week. On the day it was made public, the health minister who agreed to it, Humberto Costa, quit in a cabinet shuffle prompted by a corruption scandal that battered the government. In 2005, his successor, José Saraiva Felipe, said that no deal had been finalised, and that he wanted more discounts. “In a country where corruption is rampant, it's very good to show that there are Brazilian public servants seeking the best possible bargain,” says Otto Licks, an intellectual-property lawyer. “Keeping this in the media diverts attention from the scandal.” Playing to nationalist sentiment by granting local production rights to local firms might also boost the government's popularity [35].

Abbott could afford the loss of the Brazilian revenues (0.5% of its total sales) if a compulsory licence were issued, but industry representatives and patent-rights advocates fear the precedent-setting effect of such a move. During UR-GATT negotiations, rich countries agreed to compulsory licencing for public-health emergencies on the assumption that “governments would be spartan in their use of this nuclear option. If Brazil crossed this line, many other low- and middle-income countries could follow, reducing incentives to invest in new drugs [35].

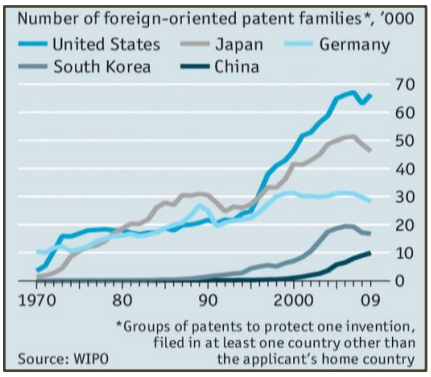
Advocates of greater access to essential medicines say that more compulsory licences would be good, and dismiss talk that research and development would suffer. “A domino effect would be excellent,” says Kevin Outterson of West Virginia University. “We should encourage poorer countries to free-ride on Western innovation. They are not part of the market anyway, and as long as it doesn't replace markets these companies rely on, the gains to public health would be tremendous” [35].

Mainland firms building up their intellectual property

No patent law existed in China until 1985, and it deserved a reputation for trampling on intellectual property rights. China’s leaders see patents as rungs on the ladder to becoming an innovation powerhouse. So in five-year plans and through subsidies and official exhortations, they have encouraged locals to file patents. Workers and students who file patents are more likely to earn a *hukou* (residence permit) to live in a desirable city. For some patents the government pays cash bonuses; for others it covers the substantial cost of filing. Corporate income tax can be cut from 25% to 15% for firms that file man patents. They are also more likely to win lucrative government contracts. Locals have responded with gusto [37].

In 2014, China’s patent office became the world’s busiest. Sceptics have scoffed that most of those filed are “utility model” patents—short-term ones granted for relatively trivial ideas, as opposed to proper “invention” patents—and that few Chinese inventors have won patents in countries where standards are higher. Many patents, it is also argued, are exercises in quota-filling by academics, with no hope of commercialisation. In short, these patents are a sham. Not quite, argues the UN’s World Intellectual Property Organisation (WIPO), which studied Chinese patents and concludes that a small but rapidly growing proportion are up to world standards [36].

The WIPO included only patents filed by Chinese residents—that is, those with a Chinese address—who filed their patents first on the mainland. So, inventions by the Shanghai labs of GE or Philips are not included, since Western MNCss typically file first in the US or Europe. Foxconn, a manufacturing goliath controlled by Hon Hai of Taiwan, is included in the study because, unlike other Taiwanese firms, it resides in China and files its patents first on the mainland. The findings challenge conventional wisdom. Not only do they show that the number of Chinese patents filed abroad is rising sharply (see chart, foreign-oriented patents). They also show that, since 2003, most of these have been invention patents, not utility-model ones [36].



Finally, the firms topping the rankings of foreign patent applications are also revealing. Some, like Huawei and ZTE, are unsurprising: 29% of all foreign filings from 2005 to 2009 were in information and communications technology. Lenovo comes in at 16th. Others, like Sinopec in oil and gas, and BYD in batteries, suggest the energy industry is rising. The surprise is that three of the top five spots are held by divisions of Foxconn. By 2012 it had filed more than 12,000 patents abroad, in areas from electrical machinery to computer technology to audio-video technology [36].

The situation varies from one industry to another. Pharmaceutical companies seem to be pleased by raids in which large quantities of counterfeit drugs have been seized, but fakes remain abundant. These often look perfect but lack the therapeutic ingredients. Difficulties in securing, extending and enforcing patents continue as well. But there are grounds for hope in part because the Chinese government, appalled by deaths from fake drugs and hungry to develop sophisticated industries, seems to be taking the problem seriously [36].

Mobile-phone manufacturers have become increasingly vigilant about copies and also seem to be getting results. Motorola, the industry's number two, says border guards in Shenzhen and Guangzhou have stopped people 75 times in recent months for carrying counterfeit products; police have conducted 14 raids on factories, and other government departments have carried out a further 65. In August a big raid on a factory led to the seizure of fake Motorola, Nokia and Sony Ericsson phones worth 3m yuan ($400,000) and the detention of 12 people. Another case earlier this year led to three convictions [36].

Even successful brand-owners recognise that they are at best controlling a problem, not eliminating it. Sellers on online auction and trading sites use carefully chosen expressions to indicate that they are offering counterfeit goods. Local prefecture officials are less interested in abstract property rights and legal nuances than they are in firms creating jobs [36].

And in some cases the government seems quite happy to look the other way. Piracy of films and music, in particular, is rampant. The small signs of improvement—a slight reduction in the number of pirated DVDs and CDs sold on the street—are overshadowed by new websites offering Hollywood's entire library. Somehow China manages to do

an excellent job of blocking internet content that might cause political problems, but is unable to stem the flow of pirated foreign films and music [36].

As part of its terms of entry to the WTO, China agreed to allow 20 movies to be imported annually. The film industry says it thought this would be a floor, but it has become a ceiling. A government edict that foreign firms can retain only 13% of box-office receipts, far too little to justify promotion for anything short of a blockbuster, further undermines the case for providing films legally, and has the effect of encouraging piracy [36].

The lively academic debate inside China about whether intellectual property already enjoys too much protection may well have provided an excuse for lack of action. This argument was particularly easy to make when Chinese products were less sophisticated. As Chinese prowess grows, however, the cost of not having property rights has started to become more apparent. The availability of free foreign movies and television has certainly held back development of a domestic industry. And Chinese firms increasingly have technology, brands and content they want to protect [36].

Patents filed by Chinese companies overseas were up by 58% in 2006; in the number of patent applications China now ranks third, behind America and Japan. Senior government officials, who have repeatedly stated that they want China to create advanced products, have realised that no one will create anything without some guarantee of protection. Calls for stronger protection have hitherto come from the US and the EU, but Chinese firms would benefit too [36].

For their part, Chinese consumers seem to be taking a greater interest in non-pirated goods. Trains leaving the station next to the Lo Wu City mall arrive at Tsim Sha Tsui station in Kowloon. Not far away, it is common to see mainland Chinese residents forming long queues to buy genuine versions of the counterfeit products that are on offer back in Shenzhen—for 100 times the price [36].

Under global trading rules, the inventors of medicines have the right to a 20-year monopoly on their inventions. But five years ago, the US joined 141 other countries in signing the Doha Declaration, confirming the right of poor countries to break drug patents and produce cheap generic drugs in the event of contagions like HIV. At the time, Thailand was heartened. It had been trying everything in its fight against AIDS. It curbed deaths among the poor by giving them generic versions of medicines invested by multinational drugs makers. So it came as a jolt in January when the US asked Thailand to sign a free trade agreement that would, on paper, dilute its right to break patents and use generics. Washington said the agreement would save lives by spurring innovation and by making multinationals more confident to sell drugs in the country. But Thai officials saw the proposal as a morbid bargain: either refuse the US offer and scuttle a trade deal with the US worth billions of dollars, or accept it and lift the price of AIDS drugs beyond the reach of the poor [38].

"Those who require the essential drugs but cannot afford it, they will have to die," said Dr. Suwit Wibulpolprasert, the Thai official coordinating the Public Health Ministry's response to the US proposal. Thailand is not alone. It is merely the latest target of a quiet worldwide campaign by the US administration to coax developing nations to barter away their patent-breaking rights in exchange for lucrative trade benefits, according to public health experts and government officials from Thailand to Brazil [38].

Specifically, Washington is pushing bilateral and regional trade agreements in which countries enact "super-patents" that prolong US drug makers' monopolies and limit the conditions under which their patents can be broken. These new rules, once they are adopted by developing countries, roll back the patent-breaking rights that were confirmed by the 2001 declaration at World Trade Organization talks in Doha, Qatar [38].

In effect, Washington is stitching together a parallel global patents system. The trade deals, negotiated in secret, attract little notice. But they have already been signed with developing countries battling AIDS, including six in Central America. And negotiations are beginning with several nations pivotal to the fight against the virus, from Thailand to five southern African countries, including South Africa and Botswana [38].

Because of these agreements, India's generics industry, the world's largest, is reining in plans to supply poor countries and refocusing on richer ones, said Dilip Shah, head of the Indian Pharmaceutical Alliance, which represents generic makers. "For the Indian pharma industry," he said, "it's not doomed; it will find a way out. But for the patients in the Third World, it's bad." Public health officials warn of catastrophic consequences if the bilateral deals are applied to AIDS drugs [38].

"If you prevent countries from using generic drugs," said Pedro Chequer, the head of Brazil's national AIDS program, "you are creating a concrete obstacle to providing access to drugs. You are promoting genocide, because you're killing people." First-generation AIDS drugs reached the world's poorest people only when the use of generics cut their cost to $140 a year from more than $10,000. As new drugs emerge to treat patients resistant to first-line medicines, the trade agreements make a similar drop "extremely difficult to ensure," according to Medicins Sans Frontieres, or Doctors Without Borders [38].

Washington maintains that the trade deals are directed toward diseases other than AIDS. And Richard Feachem, executive director of the Global Fund to Fight Aids, Tuberculosis and Malaria, based in Geneva, acknowledged that it was too early to tell whether the bilateral agreements would be used to block access to AIDS drugs. "If we do see this in practice," he said, "we should condemn it. But it really is in the interpretation of these agreements in very particular circumstances" [38].

A US-based charity this week begins work on becoming a manufacturer of a tuberculosis vaccine, in a pioneering effort to give affordable and accessible protection from the "killer" disease across the developing world. This marks the first time that a charity has taken direct responsibility for production of a vaccine with full control of a process that is currently scattered across a range of privately held factories around the world [39].

Aeras, a tuberculosis vaccine initiative, will start building and seeking regulatory approval for a plant in Maryland that could produce 150-200m doses of TB vaccine a year by the end of the decade. It would use low-cost but sophisticated technology to produce a recombinant BCG vaccine, updating existing vaccines that provide limited protection against TB [39].

Researchers hope the vaccine, which is currently undergoing tests, will be approved by 2009. It makes an important step in the fight against TB, which claims up to 2m lives a year and requires treatment over several months in its basic form, and much longer and more costly treatment for the growing number of cases of drug-resistant TB [39].

Public-private partnerships between companies, donors and charities in recent years have taken the lead in intensifying research and distribution of vaccines and medicines for the "neglected diseases" of the developing world [39].

"We wanted to guarantee delivering to the developing would at the cheapest price and with the highest quality," said Jerry Sadoff, a veteran vaccine scientist previously at Merck, who now runs Aeras. "I think this is the first time a non-profit is taking a product in development and contemplating its manufacture and distribution." He said he hoped the plant would supply the vaccine to the developed world, using a "Robin Hood model" to charge higher prices in richer countries to subsidise the cost in poorer ones [39].

With an initial investment of $10m, the Aeras plant will cultivate the vaccine in fermenters in powdered form for reconstitution in countries at risk, with far less wastage and at a lower cost than the existing dispersed methods [39].

The World Health Organization said yesterday that the number of new TB infections was still rising, mainly due to the link between TB and the HIV/Aids pandemic in Africa. There were 8.9m new TB cases in 2004, and 1.7m deaths, according to the report. Africa had both the highest number of deaths – a third of the total - and the highest mortality per capita. The WHO criticised African leaders who, for the most part, were "failing to seriously invest in TB control" and said the continent, unlike other regions, would not reach UN goals of halving prevalence and death rates by 2015 [39].

Intellectual property protection and the pandemic

India and South Africa, for instance, propose that members of the WTO waive IP protections for covid-fighting technologies, including vaccines. Some in the rich world are warming to the idea; in the US, ten Democratic senators recently urged President Joe Biden to back it. Drugmakers, however, warn that it would deal a crippling blow to innovation. Even though IP protections are not a big constraint on vaccine production today, the experience of covid-19 suggests that a re-examination of IP rights in the context of health emergencies is overdue [41].

The economic argument for IP protections seems compelling enough. Innovation is costly and risky. Pharmaceutical companies invest heavily in drug development with no guarantee of success. If other firms could freely copy a newly discovered treatment, then its price would quickly fall to the marginal cost of production, leaving the innovator unable to cover the costs of development. A short-term monopoly on production granted to innovating firms is needed to make the upfront investments economically worthwhile. Patents provide this protection [41].

IP protections do not always work in quite this way, however. Studies routinely find little or no evidence that strengthening them boosts subsequent innovation, argue Michele Boldrin and David Levine of Washington University in St Louis; pharmaceuticals, where IP rights are often assumed to be essential, are no exception. Patents award rich profits to firms even though private investment accounts for only about a third of spending on US biomedical research, they estimate. Other rewards to innovation, such as financial prizes, could yield more breakthrough drugs at lower cost. Yet for now, IP protections are crucial to the businesses of most of the firms developing covid-19 vaccines [41].

Should some of these be waived in a pandemic that continues to claim more than 10,000 lives a day? Advocates argue that the pandemic is clearly an extreme event that warrants an exemption from IP laws. The rapid creation and production of so many covid-19 vaccines is a testament to the long years of private investment in the associated technologies and the urgency with which experts at biotech firms moved when the pandemic began. But there is no ignoring the vast public resources that made these efforts possible, from support for basic research to piles of government cash. Nor would a waiver endanger pharma firms' viability. Pfizer would still be highly profitable even if you excluded its expected vaccine-related profits of $4bn in 2021 [41].

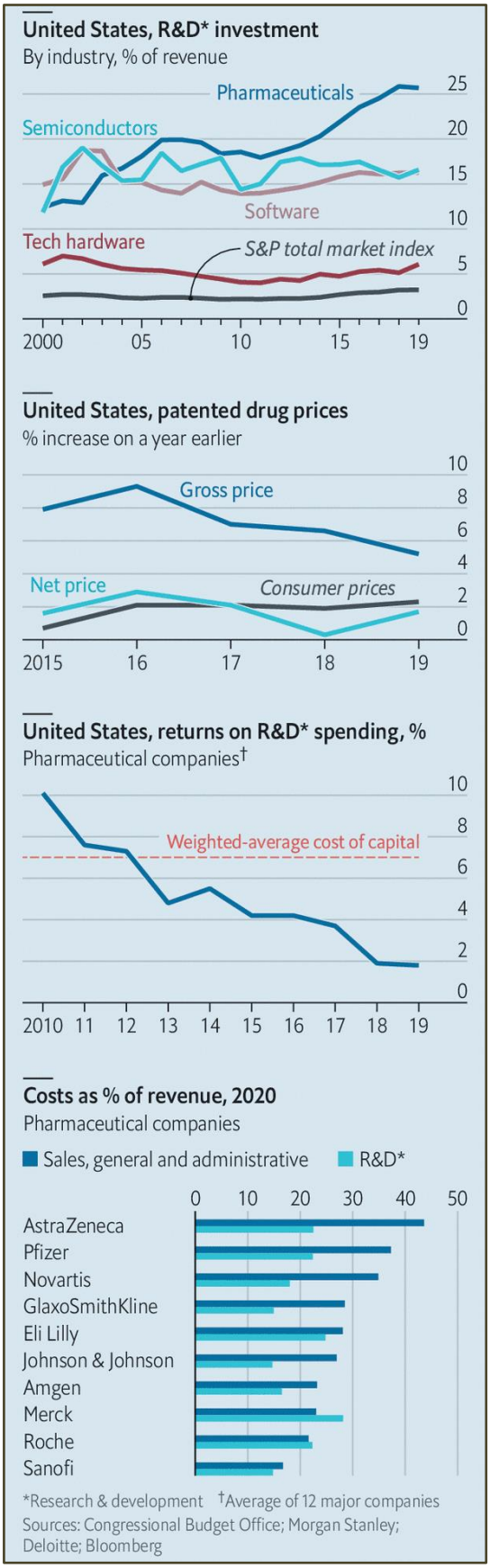
Yet industry interests are right to say that liberating vaccine IP would not unleash a flood of new production. Most of the world's vaccine-making capacity is already in use, in some cases because developers signed licensing agreements with other manufacturers. AstraZeneca, for instance, struck just such a deal with the Serum Institute of India, the world's largest vaccine-maker. Other constraints on production have bound more tightly than IP rules, including the limited availability of raw materials and expertise needed to safely produce doses. Some of those have been imposed by governments themselves, through export restrictions that interfere with supply chains [41].

Moreover, the biggest obstacle to expanding capacity is not ip protections, but proprietary resources and other know-how, which are not shielded by patents. Many poorer countries face no patent barriers to using the mrna technologies employed by Pfizer and Moderna; the obstacle is instead a lack of familiarity with new techniques. Similarly, would-be producers of adenovirus-type vaccines, such as that developed by AstraZeneca, lack access to the specially developed cell lines needed to create them [41]. This state of affairs illustrates deficiencies in how both drugmakers and governments have handled the vaccine effort. Firms have been reluctant to share cell lines, data and tacit know-how with producers that could one day pose a competitive threat, slowing the creation of new, and life-saving, production capacity. In some cases trade rules permit governments to grant compulsory licences—the right to use a patented invention without the inventor's consent, for a price. But such licences are of no use if developers do not also share the other information and resources needed to produce doses. An initiative to aid such sharing set up by the World Health Organisation, for instance, has been all but ignored by the industry [41].

Yet the experience of 2020-21 also suggests how governments might do better when they next negotiate contracts, say for vaccines to counter new variants. Having invested so much in development, they neglected to include measures in contracts to compel drugmakers to share the information other manufacturers need to quickly produce vast amounts of vaccines. Nor have they sought to press firms to transfer the technology needed to expand manufacturing. In the meantime, governments could do more to rethink the ground rules for technology transfer and the sharing of intellectual property, so as to be prepared for the next pandemic [41].

President Joe Biden threw his weight behind a proposal at the WTO to waive patent protections for covid-19 vaccines. If Mr Biden is willing to rethink IP rights for covid vaccines abroad, he might also have the audacity to take on patent protection for new drugs at home. To judge whether US's industry deserves such treatment, it is worth asking three questions. First, how much innovation is happening? Second, is rent-seeking behaviour—ranging from price gouging to patent manipulation—declining? Third, what might happen if patent rules were watered down [42]?

Start with innovation. In the 2000s pharma investment fell out of fashion. But since 2010 the US's industry has raised spending on research and development (R&D) sharply as a share of revenues, to over 25% (see chart, US R&D investment). Venture funding into life sciences in the US is booming, hitting a record high of $36bn in 2020, double the level in 2017. The number of new drugs approved by the US Food and Drug Administration has more than doubled in the past decade. None of these measures is an ideal proxy for future innovation, but they suggest the mood has changed [42].



On rent-seeking, too, the picture is less dire that it was. Drug prices in the US are still the world's highest on average, but the rate of increase has slowed. According to IQVIA, a data firm, once secret rebates offered to big customers are discounted, net drug prices rose more slowly than inflation in 2018 and 2019. Political pressure is only one reason. Consolidation among health insurers and pharmacy-benefit managers (big middlemen) who pay for drugs gave them more power to negotiate price cuts. It has got harder to mint cash from blockbuster drugs. Deloitte, a consultancy, reckons that the internal rate of return on in-house R&D at a dozen big drugs firms fell from 10% a decade ago to 2% in 2019—below their weighted-average cost of capital of 7%. The average cost to bring a drug to market has increased by two-thirds since 2010, to some $2bn. And the forecast for peak sales for each new drug has also fallen by half over that period. Often big firms prefer to buy smaller innovative rivals. According to EY, a consultancy, US drugs firms spent $185bn in the past five years on biotech acquisitions. Roughly a third of revenues at big drugs firms are the result of IP arising from acquisitions [42].

What would happen if patent rules were weakened? Rent-seeking would fall, but innovation might, too. One way of getting a sense of this is to look at how much innovation happens outside the US, where IP rights are often weaker or less well enforced. In most industries innovation is now happening globally, not just in the US, but in pharma it still has a powerful US skew. Two-thirds of worldwide biotech venture-capital investment takes place there. Despite China's advances on other fronts, in life sciences it still accounts for only about 15% of the global total of venture-capital funding. Similarly, even as US multinational pharma firms have become more global (earning roughly half their revenues abroad), their preference for domestic R&D has risen, with 88% of it done in US [42].

This suggests that America's government will eschew wholesale changes that damage innovation. But it still might loosen the patent regime to reduce rent-seeking from old drugs. In 2019 the Federal Trade Commission, a regulator, found that the industry is relying less than it used to on egregious "pay for delay" agreements, through which it paid generics firms to hold off on launching low-cost rivals to pricey drugs coming off patent. However, Big Pharma is still using other wheezes, such as "evergreening" IP protection beyond the initial 20-year period by filing a thicket of patents on minor modifications. More can be done to rein in such abuses [42].

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