# 4

# IP Calibration

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## Introduction

The 1994 Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement), which was part of the Uruguay Round package, may be seen as a vector for forces that consider the worldwide harmonization of intellectual property (IP) rules desirable. A multinational enterprise, for example, might consider that greater legal, administrative, and even infrastructural uniformity makes global expansion plans into new markets easier, faster, and probably also cheaper to effectuate. This pro-harmonization view was a key underpinning of the TRIPS Agreement's negotiations, and it remained an important factor in the early implementation of TRIPS in the laws of several members of the World Trade Organization (WTO). I have referred to this early phase as 'TRIPS 1.0'.[2]

[1] The Author is grateful to comments received on earlier drafts, including in particular from Professors Rochelle Dreyfuss and Susy Frankel. All errors and omissions are the Author's sole responsibility.

[2] D Gervais, 'TRIPS 3.0: Policy Calibration and Innovation Displacement' in NW Netanel (ed), *The Development Agenda: Global Intellectual Property and Developing Countries* (Oxford University Press, 2009) 51–75.



A second phase, marked by contestation of and opposition to TRIPS followed, fuelled in part by the pharmaceutical industry's inept reaction to the HIV-AIDS crisis in Africa and elsewhere around the year 2000. I have called this the 'TRIPS 2.0' phase.[3] Beyond the critiques of IP overprotection, this second phase uncovered various perils of excessive IP uniformity in a very diverse world. Differences among cultures, regions, countries took centre-stage. Even differences among industries began to emerge more clearly as the push continued for uniform rules, epitomized by the initial wave of model laws used to implement TRIPS in several countries before the expiry of the TRIPS transitional periods.[4]

The current phase, 'TRIPS 3.0', is informed by better and more detailed empirical and other analyses. It is a *calibration phase*, which operates on two different, yet related, levels. *Domestically*, calibration allows countries and regions to tailor policy to their potential strengths in innovation while alleviating negative welfare costs. At the level of *international norm-making*, calibration supports attempts to reflect both the need for minimum common denominators and the need to tailor innovation-related rules and policies. Finding a proper admixture of international IP disciplines (which, for many WTO members, meant foreign because TRIPS rules are a reflection of intellectual property notions largely developed in the 'West') and endogenous contextual realities *requires* calibration.

Hence, while TRIPS 1.0 may have given the illusion that the world was moving towards a single IP book of rules—a worldwide IP code, as it were—this is no longer tenable for the foreseeable future. Indeed, some saw even broader uniformity, well beyond IP, reaching investment protection, labour laws, etc, as if a single set of rules for all would yield better outcomes. This belief in a uniform set of rules is not entirely new of course. Montesquieu, Rousseau, Smith, but also Hayek could be mentioned as believing that a set of permanent optimal economic policies could be developed to promote growth *in any country*. Part of the TRIPS 3.0 debate is about how much of that belief is actually true and, conversely, how much countries can and should experiment with their own IP policy, that is, how and to what extent they should 'customize' international rules using the various flexibilities contained in TRIPS. India and New Zealand have experimented with patentable subject matter rules for example. In time, one will be able to assess whether these choices produced positive innovation outcomes.[5] Brazil

[3] Gervais (n 2).

[4] According to TRIPS, Arts 65 and 66, WTO members had until 1 January 1996 to implement TRIPS. However, developing countries and certain countries in transition towards a market economy had until 1 January 2000. The initial transitional period for least-developed countries, which expired on 1 January 2005, was extended until at least 1 July 2021. Cf WTO TRIPS Council, *Extension of the Transition Period under Article 66.1 for Least Developed Country Members*, IP/C/64 (11 June 2013).

[5] D Gervais, 'Adjusting Patentability Criteria to Optimize Innovation: A Look at China and India' in M Bagley and RL Okediji (eds), *Global Perspectives on Patent Law* (Oxford University Press, 2014). On New Zealand, see J Mullin, 'In Historic Vote, New Zealand Bans Software Patents', Ars Technica (28 August 2013), <http://arstechnica.com/tech-policy/2013/08/in-historic-vote-new-zealand-bans-software-patents/>.

was exploring various options in the same area as of this writing.[6] Debates on measures to improve online use of copyright material, with a view to maximizing authorized uses, not minimizing unauthorized ones, have emerged.[7] TRIPS 3.0's future looks promising.

International IP policy debates have moved inexorably towards calibration. This is fairly recent, however, and has not been completely internalized in negotiations. Indeed, when the first edition of this book was published (2007), it was still controversial to say that the TRIPS Agreement[8] had entered a national calibration phase; that many WTO members (other than the TRIPS demanders[9]) no longer saw TRIPS as something to be accepted and implemented mechanically in exchange for trade concessions in sectors such as tariffs and quotas on tropical fruit or textiles; or conversely that there was any value for members (other than least developed countries) in trying to find optimal ways to implement TRIPS. Be that as it may, calibration is now an (one might say 'the') accepted recommended strategy for most countries to follow.

Two of the key insights that have emerged in the TRIPS 3.0 phase seem self-evident. First, each country is different and therefore should tailor its IP policy to its own needs. This must be done within the constraints of TRIPS rules to avoid WTO disputes, and often in the face of political pressure from multinational stakeholders who prefer globally harmonized norms and practices. Second, IP policy forms part of a broader set of policies designed to maximize domestic innovation while taking due account of welfare costs in key areas such as access to pharmaceutical products and the development of vibrant marketplaces for products services and ideas. Calibration is not simple, but it is essential. Policies designed to optimize innovation while minimizing welfare costs should enhance economic growth, facilitate cultural prosperity, and foster human development.

Recent developments in scholarly and other research have shed more light on both above insights by asking (a) what makes a country different from an innovation perspective, and how does one operationalize those differences in a national IP/innovation policy; and (b) if IP is seen as part of a broader policy picture, what are the other parts of the equation, and how can a country formulate policy without getting stuck in endless overanalyses? The challenge for policymakers involves understanding and managing complexity.

At this juncture and for the predictable future, the calibration issue is mostly a matter of domestic policymaking and regional trade agreements.[10] Changes to the

[6] Late 2013.

[7] I first used this expression in 2000. See D Gervais, 'Copyright and eCommerce' in N Wilkof et al (eds), *Intellectual Property in the Global Marketplace: 2001 Update* (New York: John Wiley & Sons, 2002).

[8] WTO, *Agreement on Trade-Related Intellectual Property Rights, Apr. 15, 1994, Marrakech Agreement Establishing the World Trade Organization, Annex 1C, Legal Instruments—Results of the Uruguay Round* (TRIPS Agreement or TRIPS) (1869 UNTS 299, 33 ILM 1197).

[9] Essentially, the European Union, Japan, and the United States. See D Gervais, *The TRIPS Agreement; Drafting History and Analysis*, 4th edn (Sweet & Maxwell, 2012) 11–15.

[10] See eg n 44 and accompanying text.



TRIPS Agreement and the adoption and implementation of new wide-ranging multilateral treaties are unlikely and years away.[11] It took years to agree to the single change made thus far to the TRIPS Agreement (Article 31*bis*).[12] Calibration is thus more likely to focus on the use of 'flexibilities' contained in TRIPS, whether as specific exceptions and limitations or by interpreting the Agreement. Examples include adding fair use/fair dealing exceptions to copyright rights and setting of appropriate limits on patentable subject matter such as those just mentioned in India and New Zealand.

Structurally, calibration is not a rejection of harmonization, as in many TRIPS 2.0 analyses, nor does calibration consider having the same rules in every jurisdiction a desirable end-state. It recognizes instead appropriate differences among regions, countries, and industries. This means that rules will vary to a certain degree, creating possible issues of conflict of laws. However, full legal harmonization of tax, contract, and tort law, and the regulatory state varies just as much or more both in terms of rules and administrative practices. To a certain extent, therefore, variations are unavoidable. Calibration makes the point that those variations are in fact desirable, but that they are variations on a central theme which in intellectual property can be referred to as TRIPS.

Strategically, calibration suggests that, by developing a comprehensive IP strategy focused on innovation and welfare improvements, a country can limit the negative impact of transitioning to higher IP protection and increase its chances of reaping the benefits thereof, including technology-related foreign direct investment (FDI) and growing domestic internet, pharmaceutical, or other technology-intensive industries. In the pages that follow, I use calibration as a policy lodestar to explore the various options available to WTO members. I thus consider calibration from various perspectives, including those of indigenous innovators and creators but also major differences among countries and industries (suggesting categorical distinctions which may be useful in developing a calibrated approach). I also consider how governance impacts domestic innovation and the geographic displacement of innovation. This includes how distinctions among countries and industries affect policy efforts to develop innovation. I then propose concrete policy models, based on spillover effects and R&D clusters, and offer a few concluding thoughts.

[11] That said, multilateral norm-making continues, with the adoption of two limited but significant instruments under the aegis of the World Intellectual Property Organization (WIPO), namely the Beijing Treaty on Audiovisual Performances (Beijing, 24 June 2012); and the Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired, or Otherwise Print Disabled (Marrakesh, 27 June 2013).

[12] As of October 2013, the amendment (adopted in 2005) still had not entered into force. Forty-seven members (including the European Union) had ratified. It will enter into force once ratified by two-thirds of the membership. See <http://wto.org/english/tratop_e/trips_e/amendment_e.htm>. The amendment is not essential, however, as it was effected by a waiver adopted in 2003. This may explain the delay, at least in part.

# I. TRIPS: Beyond Reductionist Narratives

## A. The four TRIPS narratives

The history of TRIPS over the past decade is a tree that grew out of recurrent narrative acorns, namely:

- a *coercion* narrative in which the TRIPs Agreement is considered an unfair trade imposition on less economically developed countries;
- a *bargain* narrative which views the Agreement as a compromise between developed and less developed countries exchanging concessions on IP for better tariffs and quotas on items such as tropical fruit and textiles;
- an *ignorance* narrative in which many developing and least-developed countries are portrayed as not fully understanding the issues;[13] and
- a *self-interest* narrative according to which less developed countries will benefit from stronger IP protection.[14]

I described those narratives—and the theoretical frameworks used to support them—more fully elsewhere. The narratives individually do not explain the complex evolution of TRIPS, but in combination they remain relevant in understanding the move towards calibration. As mentioned in the introductory pages, immediately after the adoption of TRIPS in 1994 there was an initial phase of rapid and rather mechanical implementation of TRIPS in the laws of many WTO members, mostly it seems to avoid possible WTO disputes. I referred to this previously as 'TRIPS 1.0'.[15] But that phase did not last long once scholarly analysis of TRIPS and the four narratives had emerged.[16] Of the four narratives mentioned above, three led to suggestions limiting the impact of TRIPS, viewed as a net negative for developing countries. This fed a second phase ('TRIPS 2.0') focusing on reducing the Agreement's impacts mostly by making maximum use of its flexibilities.[17] WTO members, supported by a number of non-governmental organizations (NGOs)—most of them established post TRIPS[18]—and, in some

[13] I borrow here from the description in PK Yu, 'TRIPs and Its Discontents' (2005) 10 Marquette Intellectual Property L Rev 369 at 371–5.

[14] AO Sykes, 'TRIPS, Pharmaceuticals, Developing Countries, and the Doha "Solution"' (2002) 3 Chicago J Int'l L 47; and EW Kitch, 'The Patent Policy of Developing Countries' (1994) 13 UCLA Pacific Basin LJ 166 171. Contra, TF Cotter, 'Market Fundamentalism and the TRIPS Agreement' (2004) 22 Cardozo Arts and Entertainment LJ 307 at 335–6. See also K Outterson, 'Pharmaceutical Arbitrage: Balancing Access and Innovation in International Prescription Drug Markets' (2003) 5 Yale J Health Policy L and Ethics 193 at 215–16.

[15] Gervais (n 2).

[16] Major scholarly critiques of TRIPS started to be published soon after the entry into force of TRIPS. See eg FM Abbott, 'The WTO TRIPS Agreement and Global Economic Development' (1996) 72 Chicago-Kent L Rev 385–405.

[17] Abbott (n 16).

[18] For example, the South Centre was established in July 1995. The International Centre for Trade and Sustainable Development (ICTSD) was established in 1996. Both are Geneva-based. Knowledge Ecology International (KEI) was founded by Ralph Nader in 1995. Many others could be named here.



cases, intergovernmental organization as well, explored possible gaps in the TRIPS text and its interpretation.[19]

TRIPS 2.0 work led to 'countervailing' norm-making efforts in other forums,[20] in the hope that new non-trade norms might be used to interpret TRIPS in a dispute-settlement context in a way perceived to be more favourable to developing countries.[21] The value of these exercises has yet to be fully tested in the WTO dispute-settlement system.[22] Undeniably, the exact scope and meaning of various TRIPS provisions will become clearer with each panel and Appellate Body interpretation. The Appellate Body has indicated, for instance, that TRIPS should not be read in 'clinical isolation' from public international law.[23] Norms negotiated elsewhere could possibly be used to influence the interpretation of TRIPS, though that door has not been opened very wide thus far.[24]

The TRIPS 2.0 phase also led—in what seems an application of Newton's third law to IP norm-making—to the emergence of many demands by the original TRIPS demanders for 'TRIPS-plus' standards, many of which were precisely meant to close or limit recourse to 'loopholes' and flexibilities contained in TRIPS.

[19] See eg the *UNCTAD-ICTSD Resource Book on TRIPS and Development* (Cambridge University Press, 2005). The matter of interpretation is partly settled to the extent that the application of object and purpose—and the Vienna Convention on the law of Treaties more generally—seems to be the accepted interpretive path. This does not mean, however, that there is agreement on the scope of rights and exceptions. See S Frankel and D Gervais, 'Plain Packaging and the Interpretation of the TRIPS Agreement' (forthcoming) Vanderbilt J of Transnational L, available at <http://ssrn.com/abstract=2234580>. On the interplay of WTO and other norms (particularly in the dispute-settlement context), see GB Dinwoodie and RC Dreyfuss, *A Neofederalist Vision of TRIPS: The Resilience of the International Intellectual Property Regime* (Oxford University Press, 2012). To see an example of a suggestion that TRIPS flexibilities should be interpreted more liberally than has been the case in at least some dispute-settlement panel reports thus far, see Max-Planck-Institut für Innovation und Wettbewerb, *Declaration on a Balanced Interpretation of the Three-Step Test*, available at <http://www.ip.mpg.de/files/pdf2/declaration_three_step_test_final_english1.pdf>.

[20] GB Dinwoodie and RC Dreyfuss, 'TRIPS and the Dynamics of Intellectual Property Lawmaking' (2004) 36 Case Western Reserve J of Int'l L 95 at 121, '[D]eveloping countries have recently seen regime-shifting as a bulwark against the established power balance in international lawmaking, and over time user groups might likewise view the ability to shift forum as a valuable defensive technique.'

[21] Examples include the International Treaty on Plant Genetic Resources in Food and Agriculture (ITPGRFA) (Rome, 3 November 2001, 2400 UNTS), Arts 6.2 and 12.3(d) of which may be interpreted as prohibiting the patenting of genes in certain cases. See *Impacts of the IPR Rules on Sustainable Development*, Queen Mary University (2006), 72–4, <http://www.ip4development.org>.

[22] Indeed, in interpreting WTO Agreements, including the TRIPS Agreement, the Appellate Body repeatedly relied on the provisions of the Vienna Convention of the Law of Treaties as a primary source for interpretative guidance. In *India—Patent Protection for Pharmaceutical and Agricultural Products*, WT/DS50/AB/R, para 46, the Appellate Body confirmed the general principle of applicability of Art 31 of the Vienna Convention on the Law of Treaties in interpreting the WTO Agreement, including the TRIPS Agreement, as established in *United States—Standard for Reformulated and Conventional Gasoline*, WT/DS2/AB/R.

[23] 'US—Standards for Reformulated and Conventional Gasoline', WT/DS2/AB/R, para III.B. This principle was reflected in this and subsequent decisions, which relied on the case law of other international tribunals, namely the International Court of Justice, the European Court of Human Rights cases, and the Inter-American Court of Human Rights, in interpreting the provisions of the WTO Agreement (*United States-Standard for Reformulated and Conventional Gasoline*, WT/DS/AB/R, para III.B, footnote 36; *Japan—Taxes on Alcoholic Beverages*, WT/DS8/AB/R, part D, footnote 19). See Frankel and Gervais (n 19).

[24] Dinwoodie and Dreyfuss (n 20).

In recent years, those discussions have moved to members-only 'clubs' and are mostly held in secret, possibly to avoid 'interference' from outside voices.[25]

The more recent 'TRIPS 3.0' *calibration phase*, already described above, is partly a reflection of a better-defined self-interest of a number of developing economies, which have benefited from a displacement of innovation and are trying to adapt their policy framework to play the global innovation game better.

## B. The displacement of innovation

A number of 'TRIPS 2.0' analyses showed that imposing higher levels of intellectual property protection may impose significant welfare costs in many developing nations. Yet it may also create or lead to the emergence of new competitors for the same companies that lobbied for TRIPS, as more developing nations develop technology-absorptive capacity and the related ability to innovate and compete. Combined with a healthy dose of economic nationalism,[26] the medium-term impact of TRIPS and related measures such as free-trade agreements and bilateral investment treaties are certainly worth pondering. Consider Japan after World War II and now, or China in 2000 and China circa 2025.[27]

While the multinational companies that sowed the TRIPS seed probably had no choice but to pursue this course of action from a business standpoint,[28] it may very well be that the powers of innovation, once unleashed and properly supported, will cut Western dominance short. *There is a place to take in the global innovation game*, and some developing countries will come out ahead if their IP policy is properly calibrated to limit welfare costs while adequately supporting innovation. The end result of well-calibrated TRIPS implementation for many developing countries could thus be positive in aggregate terms, if very uneven.[29] In other words, and as India's 'silicon valley' centred around Bangalore has begun to demonstrate, the appropriation process that began by the limited outsourcing of low innovation coding[30] or other functions (eg call centres) has evolved to progressively more

[25] D Gervais, 'Country Clubs, Empiricism, Blogs and Innovation: The Future of International Intellectual Property Norm-Making in the Wake of ACTA' in M Burri and T Cottier (eds), *Trade Governance in the Digital Age* (Cambridge University Press, 2012) 323–43, <http://www.amazon.com/Trade-Governance-Digital-Age-ebook/dp/B0089NURF8#reader_B0089NURF8>.

[26] KJ Vandevelde, 'The Political Economy of a Bilateral Investment Treaty' (1998) 92 American J Int'l L 621–3.

[27] J Straus, 'The Impact of the New World Order on Economic Development: The Role of Intellectual Property Rights System' (2006) 6 J Marshall Review of Intellectual Property L 1 at 5–9, where Professor Straus describes 'China's commanding, complex, and almost scary development'.

[28] Multinational (or perhaps more accurately transnational) corporations 'account for a major share of global R&D. Indeed, with $310 billion spent in 2002 (United Kingdom, DTI 2004), the 700 largest R&D spending firms of the world—of which at least 98% are TNCs—accounted for close to half (46%) of the world's total R&D expenditure and more than two-thirds (69%) of the world's business R&D'. UNCTAD, *World Investment Report 2005*, 1191; and RM Sherwood, 'Some Things Cannot Be Legislated' (2002) 10 Cardozo J Int'l and Comparative L 37 at 39–40.

[29] MP Ryan, 'Knowledge-Economy Elites, the International Law of Intellectual Property and Trade, and Economic Development' (2002) 10 Cardozo J Int'l and Comparative L 271 at 303.

[30] J Heitzmann, 'Becoming Silicon Valley', *Seminar* (2001), 503, <http://www.india-seminar.com/2001/503/503%20james%20heitzman.htm>. A well-known commentator attributes the acceleration of outsourcing to India to the need of Western companies to deal with the Y2K 'bug', which required extensive but fairly straightforward coding. In that case, the deadline was self-evidently unmovable. See TL Friedman, *The World is Flat: The Globalized World in the Twenty-First Century* (Penguin Books, 2005) 131–7.



complex tasks and higher innovation activities, leading to voluntary or inevitable technology and knowledge transfers and to significant innovations in the recipient countries with sufficient absorptive capacity. Outsourcing is a major form of technology transfer. It has served as a stepping-stone to higher innovation functions and eventually to world-class competitiveness for many stakeholders in the developing world.[31]

Granted, the etiology of the development of the innovative potential of developing countries has thus far been anchored in transfers of know-how and technology from more industrialized nations to developing ones. This is not new. It spurred decades of discussions and debate on Article 5A of the Paris Convention and its limits on forfeiture of patents and compulsory licences for failure to 'work' an invention.[32] In some cases, indigenous innovative capacity is added to the mix. India's programming powerhouse has shown the potential for homegrown innovation-based industries and the same could likely be said of China's manufacturing industries.

Because the West often cannot compete on manufacturing costs and less so on productivity gains than before, if and when it loses its competitive innovation advantage, the gravity centre of the global economy will shift. Perhaps the plan is that, through investment and acquisition, the same capital, though geographically reconfigured will remain dominant in most industries.[33] That would explain the post-TRIPS emphasis on investment liberalization, another key step to allow global reconfiguration of business.[34] It also helps to shed light on the shape of international negotiations in the field of IP.

This will become a major issue for Western tax authorities—if it is not already. While simply naming a small foreign shell as a company's headquarters to avoid tax liability does not work as well as it may have in the past, many other avenues, including mergers with smaller foreign firms, are now used to move companies out of certain tax jurisdictions, including the United States.[35] Making matters worse, IP-based royalties are often channelled (as intangibles)

[31] UNCTAD, *World Investment Report 2005*, 102.

[32] P Roffe and G Vea, 'The WIPO Development Agenda in Historical and Political Context' in NW Netanel (ed), *The Development Agenda: Global Intellectual Property and Developing Countries* (Oxford University Press, 2009) 79–110.

[33] A well-known author argues that, once the proper legal system and protection is in place—and especially what he refers to as the invisible infrastructure of 'asset management'—the conditions required for the Western capitalist model to be movable and innovation fully to emerge will be present. See H de Soto, *The Mystery of Capital: Why Capitalism Triumphs in the West and Fails Everywhere Else* (Basic Books, 2006).

[34] UNCTAD maintains a database of bilateral investment treaties. The list is impressive. As of 1 June 2006 it listed forty-eight bilateral treaties involving the United States alone. See <http://www.unctadxi.org/templates/DocSearch____779.aspx>.

[35] D Gelles, 'New Corporate Tax Shelter: A Merger Abroad', *New York Times*, 8 October 2013, <http://dealbook.nytimes.com/2013/10/08/to-cut-corporate-taxes-a-merger-abroad-and-a-new-home/?hp&_r=0>.

to lower tax jurisdictions. This suggests a massive move to sales-based taxes to replace income-based revenues.[36]

## C. Calibration in international negotiations

The World Intellectual Property Organization (WIPO) has been retooling to face the demands of the developing world in what seems an acknowledgment of calibration as a useful, indeed a necessary driver. Its member states adopted a Development Agenda meant to infuse all of its activities with a normative direction pointing towards measurable developmental objectives.[37] This 'entails a significant reform of WIPO'.[38] The organization seems to have responded, noting for example that:

> IP for Development is an emphatic articulation of the notion that IP is not an end in itself but rather is *a tool that could power countries' growth and development.* WIPO, as the lead United Nations agency mandated to promote the protection of intellectual property through cooperation among states and in collaboration with other international organizations, is committed to ensuring that all countries are *able to benefit from the use of IP* for economic, social and cultural development.[39]

The focus has shifted to measurable impacts and objectives, which in turn has been translated into demands for data and analyses. That seems an irreversible change. It also feeds evidence-based calibration efforts. WIPO has hired economists and also published economic analyses.[40] Partly as a result of this and of TRIPS 2.0 analyses more generally, the push to apply higher protection to least-developed countries has been sidelined. The WTO itself did so, because the likelihood is that welfare costs of higher IP protection will outweigh innovation-derived economic growth in those countries.[41]

The impact of a shift in multilateral negotiations towards the preoccupations of the developing world is visible. For the first time, WIPO member states discussed a treaty dealing solely with a set of exceptions and limitations to copyright, leading to the conclusion of the Marrakech Treaty (access by the visually-impaired) in June 2013.[42] Discussions on other exceptions and limitations continue.

[36] Trade rules preventing discrimination in government procurement would probably shield a corporation acquiring a new 'nationality' from discrimination in its former home country even for government-related work and contracts.

[37] C Deere, 'The Politics of Intellectual Property Reform in Developing Countries: The Relevance of the World Intellectual Property Organization' in NW Netanel (ed), *The Development Agenda: Global Intellectual Property and Developing Countries* (Oxford University Press, 2009) 111–33.

[38] SF Musungu, 'The Role of WIPO's Leadership in the Implementation of WIPO's Development Agenda' in J deBeer (ed), *Implementing the World Intellectual Property Organization's Development Agenda* (Wilfrid Laurier University Press, 2009) 70–8 at 75.

[39] WIPO, 'Intellectual Property for Development', <http://www.wipo.int/ip-development/en>. Emphasis added.

[40] See <http://wipo.int/econ_stat/en/economics/>.

[41] WTO TRIPS Council, *Extension of the Transition Period under Article 66.1 for Least Developed Country Members*, IP/C/64 (11 June 2013).

[42] Marrakesh Treaty to Facilitate Access to Published Works for Persons Who Are Blind, Visually Impaired, or Otherwise Print Disabled (Marrakesh, 27 June 2013).



In parallel and as already alluded to, perhaps also in reaction to those efforts, the past five years have witnessed the formation of 'IP country clubs' designed to negotiate higher protection and enforcement norms among like-minded partners in relative secrecy, including the Anti-Counterfeiting Trade Agreement (ACTA), the Trans-Pacific Partnership's (TPP) intellectual property chapter, and the Transatlantic Trade and Investment Partnership (TTIP).[43] ACTA was the first major international, non-multilateral IP negotiation to be based not on geography but rather on like-mindedness.[44] In 2010, I described this as the 'country club' model, an expression I used to contrast this approach from the multilateral one.[45] TPP and TTIP are broader negotiations including IP. Their broad nature will allow for bargains to be struck across sectors (farm subsidies for longer effective patent terms etc). There is a risk of overreach.[46] Additionally, it is hard to tell whether those negotiations are informed by the latest evidence on the optimal scope of protection. Secrecy involving the negotiation process is an obstacle for those who would want to inject such evidence into the policy discussions.

While the attempt to create country clubs is likely to continue, multilateral discussions continue. Indeed, there are two parallel, competing IP multilateral norm-making tracks. The first is mostly a push for greater flexibilities; the second for higher levels of protection. The first is public and increasingly relies on evidence-based arguments. The second track has been more secretive and much harder to evaluate. If the first track embraces calibration (TRIPS 3.0) as its main driver—and thus moves beyond TRIPS 2.0—there is little doubt that it will win the policy debate when the two parallel tracks engage, as they inevitably will. When the two tracks engage, whether they can be combined to form the basis for comprehensive multilateral IP reform remains to be seen. If the first track has the data and analyses that support calibration, informed by actual successes of calibration in a number of countries, ideological bulwarks will likely offer continued resistance to what they perceive as a softening of the IP regime, as new or updated agreements are negotiated regionally or multilaterally.

Achieving a broadly successful outcome would require leaving the sycophantic echo chambers that many proponents of each track seem to prefer. If multilateral reform cannot be achieved, the alternative will be a series of smaller scope agreements, each ratified by a group of ten to thirty countries, thus leading to a

[43] PK Yu, 'The Non-multilateral Approach to International Intellectual Property Norm-setting' in D Gervais (ed), *Research Handbook on International Intellectual Property Law* (Edward Elgar Publishing, 2014).

[44] A possible precedent is the Trans-Pacific Strategic Economic Partnership Agreement (known as TPSEP or P4) ratified by Brunei Darussalam, Chile, New Zealand, and Singapore. The P4 was used as a platform to launch the TPP negotiations. The P4 is an example of calibration to a certain extent because in addition to affirming TRIPS it (a) says that parties may protect traditional knowledge (Art 10.3(3)(d)); (b) contains digital copyright exceptions (Art 10.3(4) *in fine*); and (c) protects certain Chilean geographical indications beyond TRIPS (Art 10.5 and Annex 10A). Full text available at <http://www.mfat.govt.nz/downloads/trade-agreement/transpacific/main-agreement.pdf>.

[45] D Gervais, 'Country Clubs, Empiricism, Blogs and Innovation: The Future of International Intellectual Property Norm-Making in the Wake of ACTA' in M Burri and T Cottier (eds), *Trade Governance in the Digital Age* (Cambridge University Press, 2012) 323–43.

[46] SR Frankel, 'Intellectual Property in New Zealand and the TPPA' in J Kelsey (ed), *No Ordinary Deal—Unmasking the Trans-Pacific Partnership Free Trade Agreement* (Bridget Williams Books, 2011) <http://ssrn.com/abstract=1653591>.

variegated and unstable IP picture. How and why that would be viewed as a preferable outcome is unclear (to me at least).

True, at this juncture the multilateral picture seems less than rejoicing. The emergence of real calibration efforts at the *domestic* level in many countries leads me to be cautiously optimistic, however. Once domestic calibration is better understood, multilateral progress may be easier to make, in the form of a *combination of new rights, exceptions, and enforcement measures*. In other words, if individual countries and regional policymakers can experiment successfully with IP calibration, lessons may be abstracted from those experiments and used multilaterally. By the same token, with the emergence of more and better empirics, unsupported, spurious demands for more IP protection in areas where it can be shown to be counterproductive are more likely to be ultimately dropped as part of any such negotiation.

Looking at the evidence, it should be clear that property-based rhetoric is obsolete, especially online where not every unauthorized use should be treated the same, namely as possible criminal piracy. Trade law is pragmatic. Trade tests based on actual impacts of violations are fairly common in WTO law and could be applied here.[47] As part of a broader agenda, however, protection levels should be adjusted (and increased where IP works well), including in the enforcement area against commercial pirates and counterfeiters.

## II. The Parameters of Calibration

### A. Defining the objective

Most developing countries no longer accept the fact that TRIPS must be an seen as ongoing payment for cross-sectoral concessions in the Uruguay Round. Instead, they want to learn how to benefit from intellectual property by maximizing the positives[48] while minimizing the negatives in terms of higher consumer prices, job losses, and other welfare costs. They also have a better understanding of the trade-strategic game in which they are players.[49]

Policy debates in this area tend to be more productive when participants recognize both that intellectual property can help avoid certain market failures (because ideas, creations, and inventions are non-exclusive and non-rivalrous but profits are not) and that IP rules should aim to improve general welfare and be fair to social interests at play even where this cannot be measured at the level of individuals.

[47] Frankel and Gervais (n 19).

[48] Professor Peter Yu explains that intellectual property may appeal to leaders in developing countries because it holds out the promise of new jobs, FDI, tax revenues, technology transfer and the development of local artists, inventors, and indigenous industries. PK Yu, 'From Pirates to Partners: Protecting Intellectual Property in China in the Twenty-First Century' (2000) 50 American U L Rev 131 at 192–3.

[49] S Scotchmer, *Innovation and Incentives* (MIT Press, 2004) 329: '... intellectual property rights are no longer a way to encourage domestic innovation. They also become a strategic instrument to affect profit flows among nations. To affect profit flows favourably, each country wants the strongest possible protections in foreign countries, and the weakest possible protections for foreigners in its own domestic market'.



Moving now to a broader policy agenda at the national/regional level, how does one design a calibrated implementation of TRIPS as part of an innovation optimization strategy? Let us begin by eliminating what is unlikely to work. Probably no definitive answers given to questions such as whether the optimal term for a patent is twenty, eighteen, or twenty-two years. All we know is that, beyond a certain optimal point, patent protection decreases innovation.[50] Situating that point is the policy equivalent of the Heisenberg Uncertainty Principle in physics. For copyright, is the optimal term life of the author plus zero, fifty, or seventy years?[51] Or would a term based on publication or creation work better? What combination of rights and exceptions would achieve the policy purposes better than those now in place? Can't one question whether a single term, for a huge range of creations (protected by copyright) or inventions (protected by patent) is itself part of the problem? One could argue that for certain forms of invention or creation—indeed for specific inventions or works—a certain term is optimal, while a different one is more adequate in a different context.[52]

These high-level discussions can take the form of perpetual balancing acts, making it harder to reach a calibration target.[53] Additionally, the unintended consequences and workaround of under and over protection make that type of equation functionally impossible to solve due to the moving nature of the target. By the same token, studies have confirmed what seems intuitively correct, namely that in countries without the necessary technology-absorptive capacity, increasing patent protection on pharmaceuticals produces little if any innovation outcomes.[54]

Instead of engaging in *systemic* analyses of this type, policymakers could try to factor in the added value of *each creation or invention*. This value could depend in turn on measuring the exact size of the inventive step[55] and/or the degree to which

[50] This is not a new idea but it is difficult to operationalize. See NT Gallini, 'Patent Policy and Costly Imitation' (1992) 23(1) Rand J of Economics 52–63; and O Cadot and SA Lippman, 'Barriers to Imitation and the Incentive to Innovate' (1995) 095/23/EPS, <http://ssrn.com/abstract=7187>.

[51] *Eldred v Ashcroft*, 537 US 186, 193, 123 S Ct 769, 774–5 (2003). It has been argued that the current US and European term of 'life plus 70 years' is the economic equivalent of perpetual protection. See C Sprigman, 'Reform(aliz)ing Copyright' (2004) 57 Stanford L Rev 485 at 522.

[52] One *ex post* sign would be whether the invention is still actively being exploited at the expiration of the patent. However, if only inventions whose value had lapsed fell into the public domain, the societal value of granting a twenty-year monopoly would come into question. In the United States, there is a long history of extending the term of specific patents by private Bills. CL Stanley, 'A Dangerous Step Toward the Over Protection of Intellectual Property: Rethinking *Eldred v. Ashcroft*' (2003) 26 Hamline L Rev 679 at 694–5. Historically, the term of a patent was set by private Bill until a standard term was introduced into federal law. See TB Nachbar, 'Intellectual Property and Constitutional Norms' (2004) 104 Columbia L Rev 272 at 338–9.

[53] R Falvey, N Foster, and D Greenaway, 'Intellectual Property Rights and Economic Growth', Internationalisation of Economic Policy Research Paper No 2004/12 (2004), 2, <http://ssrn.com/abstract=715982>.

[54] F Lafargia, F Montobbio, and L Orsenigo, 'IPRs and Technological Development in Pharmaceuticals: Who is Patenting What in Brazil after TRIPS' in WN Netanel (ed), *The Development Agenda: Global Intellectual Property and Developing Countries* (Oxford University Press, 2009) 293–319; and S Lall, 'Indicators of Relative Importance of IPRs in Developing Countries' (UNCTAD-ICTSD Project on IPRs and Sustainable Development, 2003), <http://bit.ly/15GHTAb>.

[55] In the area of pharmaceuticals, a difference is often made between pioneer drugs and so-called 'me-too' drugs. The latter are variations on a molecule developed by another laboratory which tends

this step overlaps the predictable industrial or commercial applicability of the invention. One could add to this equation the degree of competition in the industrial or economic sector impacted by the invention and, correlatively, whether there are dominant players by market share.[56] Even if such proposals could pass the test of transaction costs, however, experts could only guesstimate the future utility of the invention. In terms of predictability, time, and transition/protection costs, a single term of protection may thus be better, even if it may seem a theoretically less refined solution. It is certainly simpler.

Both the systemic and case-by-case approaches seem suboptimal. A more realistic set of questions for policymakers trying to effectuate calibration revolves around the level of rights and exceptions that, *within the range of TRIPS-compatible implementations*, is most likely to achieve the policy purposes of maximizing innovation while minimizing negative welfare impacts. This is both because TRIPS is here to stay and because it only 'harmonized' national laws to a degree, thus leaving room for calibration.[57] In crafting a set of policy objectives, one should use a combination of human *and* economic development factors, especially now that they can be translated into a series of objectives amenable in part at least to the kind of metrics that evidence-based policymaking might call for (eg the United Nations Human Development Index).[58] Development is 'a pseudonym for a complex network of benefits associated with economic growth and human social capital'.[59] It is

> the sum of the changes in social patterns and mentalities through which the production devices coupled with the population: the latter acquires the capacity to utilize the production device to achieve what is considered to be a satisfactory growth rate, and the production device supplies a product that serves the population instead of being 'alien' to it. This dialectic of production device and population is the essence of development.[60]

Establishing broad developmental goals, however, is not the same as implementing them domestically. Each country implementing TRIPS must recognize how it compares to others in the region or countries elsewhere at a similar level of development. In the following pages, I consider differences between countries and industries. Before doing so, however, it is worth spending some time on the fact that developing countries must often add another dimension, namely the need to address traditional and indigenous innovation.

to have the same physiological/therapeutic effect, but without infringing the 'pioneer's' patent. See *US v Generix Drug Corp*, 460 US 453, 103 S Ct 1298 (1983).

[56] A Hollis, 'An Efficient Reward System for Pharmaceutical Innovation' (2004), <http://www.ita.doc.gov/td/chemicals/phRMA/Hollis%20Response.pdf>.

[57] JH Reichman, 'The TRIPS Agreement Comes of Age: Conflicts or Cooperation with the Developing Countries?' (2000) 32 Case Western Reserve J of Intl L 441.

[58] The United Nation's Human Development Index comes to mind. See <http://hdr.undp.org/en/media/HDR_2013_EN_TechNotes.pdf>.

[59] RL Okediji, 'History Lessons for the WIPO Development Agenda' in WN Netanel (ed), *Intellectual Property and Developing Countries* (Oxford University Press, 2009) 137–62 at 140.

[60] F Perroux, 'The Pole of Development's New Place in a General Theory of Economic Activity' in B Higgins and D Savoie (eds), *Regional Economic Development: Essays in Honour of François Perroux* (Unwin Hyman, 1988) 48–76 at 70.



## B. TRIPS and traditional innovation

The protection of traditional knowledge has been discussed in international fora over last few years.[61] The Doha Ministerial Declaration briefly put it at centre-stage.[62] There were several valid reasons for the issue's move to the forefront. First, a large number of countries believe that up to now they have not derived great benefits from 'traditional' forms of IP, yet find themselves rich with traditional knowledge, especially genetic resources, medicinal knowledge, and folklore. They would like to exploit these resources and several major companies share this interest. A second reason is the growing political importance of aboriginal communities in several countries. While pharmaceutical and biotechnological companies are looking at ways to exploit indigenous medicinal knowledge and genetic resources often found in developing countries, the internet is progressively allowing creators of folklore or folklore-based copyright material to disseminate their material worldwide at very low cost. The development of treaty provisions under the aegis of WIPO[63] could yet produce TK-protective norms multilaterally. It could also serve to draft regional instruments.

Two questions emerge when considering the introduction of TRIPS-compliant IP norms in environments rich in traditional knowledge and genetic resources. The first concerns ownership. It is whether IP norms are adequate to deal with communally held knowledge.[64] The second question is the interface between (new) TK-protective norms and existing forms of IP, for example when genetic resources are used by scientific and industrial entities not owned or authorized by the keepers of the TK.[65] Whether new norms do in fact surface and become internationally binding, the debates surrounding those questions have been useful in that they have shed light on the adventitious nature of IP property norm-making over the past decades. They have also illuminated some of the interactions between law and legal ideologies as a facet of culture, which one could define in this context as the

[61] UPDATE For WIPO activities in this area, <http://www.wipo.int/tk/en/>. See also C Raghavan, 'ASEAN for Protecting Indigenous/Traditional Knowledge', *Third World Network*, 5 May 2000, <http://www.twnside.org.sg/title/asean.htm> and A Cosbey, 'The Sustainable Development Effects of the WTO TRIPS Agreement: A Focus on Developing Countries' (March 1999), <http://www.tradeobservatory.org/library.cfm?filename=Sustainable_Development_Effects_of_the_WTO_TRI.htm>.

[62] Paragraph 19 reads in part as follows: '[Ministers] instruct the Council for TRIPS, in pursuing its work programme [...] to examine, inter alia, the relationship between the TRIPS Agreement and the Convention on Biological Diversity, the protection of traditional knowledge and folklore, and other relevant new developments raised by members pursuant to Article 71.1.' The issue was quickly dropped in major WTO policy work on the Round, however.

[63] WIPO, *Draft Provisions on the Protection of Traditional Knowledge (TK)* and *Draft Provisions on the Protection of Traditional Cultural Expressions/Expressions of Folklore (TCEs)*, <http://www.wipo.int/tk/en/consultations/draft_provisions/draft_provisions.html>. At the tenth session of the Intergovernmental Committee Intellectual Property and Genetic Resources, Traditional Knowledge and Folklore held from 30 November to 8 December 2006, was still looking for ways to move the debate forward on both TK protection and access to and protection of genetic resources.

[64] D Gervais, 'Traditional Knowledge and Intellectual Property: A TRIPS-Compatible Approach' (2005) Michigan State L Rev 137–66.

[65] P Drahos, 'A Networked Responsive Regulatory Approach to Protecting Traditional Knowledge' in D Gervais (ed), *Intellectual Property, Trade and Development* (Oxford University Press, 2007).

'interactive aggregate of common characteristics that influence a human group's response to its environment'.[66] Put differently, creativity and innovation are so interwoven into the social and cultural fabric that the set of norms developed in eighteenth-century Europe and then amplified in negotiations between mostly Western nations until TRIPS must almost necessarily be adapted to reflect the needs of indigenous creators and innovators.[67] This is also a form of calibration.

## C. Distinctions among developing countries

Developing countries are obviously not all identical, far from it. The UK Intellectual Property Rights (IPR) Commission Report stressed that it is important not to consider developing countries as a homogeneous group.[68] Yet the TRIPS Agreement essentially treats them all on the same footing. All developing countries other than LDCs had until 1 January 2000 to implement TRIPS—with up to five more years to apply product patent protection to pharmaceuticals for those, like India, that did not provide such protection.

Developing countries can be grouped in various ways for purposes of this type of analysis. Leaving aside least developed countries (LDCs) for which obligations have been suspended[69]—one could distinguish developing countries in which innovation benefits outweighed additional rent extraction made possible by TRIPS and those countries where additional rent extraction made possible by TRIPS outweighed innovation benefits. This 'net outcomes' approach should lead one to conclude that, assuming that TRIPS is accepted as a given set of constraints, countries should aim to move from the second to the first group by improving innovation outcomes but also adopting remedial actions (using the so-called TRIPS 'flexibilities') to reduce costs imposed by higher IP protection.

Using a host of factors including domestic market size, diversification, and purchasing power (and resulting 'market power'), a similar approach—but one more squarely focused on pharmaceuticals—was suggested by Benoliel and Salama.[70]

[66] G Hofstede, 'Culture's Consequences: International Differences in Work-Related Values 25' (1980) quoted in NV Demleitner, 'Combating Legal Ethnocentrism' (1999) 31 Arizona State LJ 737 at 739. IP laws fail to reward those knowledgeable communities and collaborators that provided the raw intellectual material that formed the true basis for the copyrighted work or patented invention. See <http://college.hmco.com/english/amore/demo/ch5_r2.html>.

[67] K McLeod, *Owning Culture: Authorship, Ownership, and Intellectual Property Law*, vol 1 (P Lang, 2001); RJ Coombe, 'Critical Cultural Legal Studies' (1990) 10 Yale J of L and the Humanities 463. Also consider economist Max Wirth's objection to the ownership of patents: 'Inventions do not belong in the category of intellectual property, because inventions are emanations of the current state of civilization and, thus, common property... inventions are merely blossoms on the tree of civilization.' See RE Meiners, 'Patents, Copyrights, and Trademarks: Property or Monopoly?' (1990) 13 Harvard J L and Public Policy 916; and C May, *Intellectual Property Rights: A Critical History* (Lynne Reinners Publishers, 2006) 43.

[68] UK Commission on Intellectual Property Rights, *Integrating Intellectual Property Rights and Development Policy* (2002).

[69] See extension of the transition period under Art 66.1 for least developed country members. Decision of the Council for TRIPS of 11 June 2013. WTO document IP/C/64 (n 41).

[70] D Benoliel and B Salama, 'Towards an Intellectual Property Bargaining Theory: The Post-WTO Era' (2010) 32 U of Pennsylvania J of Int'l L 265–368.



They separated developing countries into three groups according to their bargaining power: low, medium, and high. The last two categories are reserved for newly industrialized countries.[71] Paradoxically, they suggest that less or non-innovative countries have more bargaining power. This stronger position comes 'because of their ability to issue compulsory licenses'.[72] This observation seems largely correct. By contrast, a stronger pharmaceutical innovation sector in certain countries 'restricts the ability of their governments to issue compulsory licenses that would make drugs more affordable'.[73]

In trying to find ways to identify and measure distinctions among developing countries, Chen and Puttitanum's empirical analyses show that, in countries with GDP per capita exceeding $1,260 (2005 dollars[74]), a growing reliance on stronger IPR regimes is perceptible.[75] My sense is that a host of other correlations could be found, such as educational level, corruption indices, etc. Another promising set of factors and taxonomy was proposed by Professor Llew Gibbons.[76] He grouped developing countries according to three stages of development:

**Stage one** (which may be seen as including LDCs):

- foreign direct investment rare and usually limited to specialized sectors—often relating to the exploitation of natural resources or developing franchise service industries like a major international brand bottling company;
- unskilled, cheap labour;
- foreign businesses create the necessary infrastructure and invest in human capital;
- developing countries ideally investing in the training of skilled workers and junior managers. Successfully developing a skilled workforce is a prerequisite to entering stage two.

**Stage two**

- economy now able to absorb technology, to imitate technology at some level, and to contribute minor improvements;
- well-educated workforce adapted to absorb new technology and incorporate it into the domestic economy;
- domestic research efforts primarily facilitative or associated with technology transfer. Focus shifts gradually to efforts on more innovative projects.

[71] Benoliel and Salama (n 70) 310.

[72] Benoliel and Salama (n 70) 312.

[73] Benoliel and Salama (n 70) 311. Applying these criteria, they consider China and India as medium-bargaining power countries, while Brazil, South Africa, and Thailand have high bargaining power.

[74] Or approximately US$1500 at end of 2013.

[75] Y Chen and T Puttitanun, 'Intellectual Property Rights and Innovation in Developing Countries' (2005) 78 J of Development Economics 474–93 at 483–9.

[76] LJ Gibbons, 'Do As I Say (Not As I Did): Putative Intellectual Property Lessons for Emerging Economies from the Not So Long Past of the Developed Nations' (2011) 64 SMU L. Rev 923–73 at 932–3.

**Stage three**

- newly industrialized country producing its own IP;
- nations very selective as to which IPRs they zealously protect and which rights they encourage (mis)appropriation of.

This progression from imitation to absorption to innovation tracks the innovation theorists' view of innovation following a path from imitation to adaptation to true global innovation.[77] 'Stage 2' countries likely overlap the group identified previously, namely countries where innovation outcomes do not (yet) outweigh the additional rent extraction made possible by the implementation of TRIPS-compatible norms. As countries build innovation-focused industries, they typically develop, as Professor Gibbons rightly notes, more sophisticated and nuanced views of their IP policies.[78] Simply put, they play the IP game better. The various groupings of countries all point towards a similar path of progression. Along that path, which the evolution of IP rules in developed countries would seem to confirm, countries gradually make more and better use of IP rights.[79]

This poses a related question, namely whether China, and possibly other BRICS countries, are a model or more of an exception. If the latter is true, most non-BRICS countries may have little interest in high levels of IP protection, because they would be unlikely to benefit in the short or medium term, and would have to accept higher costs due to higher rent extraction. There is no unanimous answer here.

There are valid arguments for treating large emerging economies, such as some of the BRICS countries, as special cases—and perhaps China as special even among that group. In 2005, while developing countries accounted for only 23% of worldwide research and development, this figure dropped to 14.8% if China was excluded.[80] As possible additional support for this claim, analyses in other developing countries provide mixed results. In Jordan, for example, the government has tried to develop a pharmaceutical industry. It has 'linked its development goals and reform agenda inexorably to the new global economic order, which on the trade side is represented by embracing globalization and open borders; ... patent protection periods, copyright protection scopes, trademark registration and categorization mechanisms, to name a few, were globally harmonized'.[81] Yet the Jordanian attempt to lure international pharmaceutical research has apparently not been

[77] Cf D Gervais, 'TRIPS and Innovation: How Recent Developments Might Inform Canada's Foreign Technology Policy' (2013) 29(1) Canadian Intellectual Property Rev 141–62 at 161.

[78] I had arrived at a similar conclusion. See D Gervais, 'Intellectual Property and Development: The State of Play' (2005) 74 Fordham L Rev 505–35.

[79] Cf S Ragavan, *Patent and Trade Disparities in Developing Countries* (Oxford University Press, 2012) 12–29; and KE Maskus, 'The WIPO Development Agenda: A Cautionary Note' in WN Netanel (ed), *The Development Agenda: Global Intellectual Property and Developing Countries* (Oxford University Press, 2009) 163–74 at 169.

[80] TK Cheng, 'A Developmental Approach to the Patent-Antitrust Interface' (2012) Northwestern J of Int'l L and Business 1–79 at 9.

[81] FK Nesheiwat, 'The Adoption of Intellectual Property Standards beyond TRIPS—Is It a Misguided Legal and Economic Obsession by Developing Countries?' (2010) 32 Loyola of Los Angeles Int'l & Comparative L Rev 361–94 at 365.



particularly successful, though the costs of policy compromises made to attract the investment (including higher patent protection) remain to me measured.[82]

Hopefully, the discussion in the previous pages shows that differences among countries and their level of human and economic development matter. The next section considers differences in the nature of the industries that each country can develop.

## D. Distinctions among industries

In the same way that it put every developing country in a more or less equal position, TRIPS also put all industries on the same footing. And in the same way that this does not mesh well with distinctions that can be observed among countries, treating all industries as equally sensitive to intellectual property protection is simply incorrect. This has a number of unintended consequences.

It has been said that pharmaceutical companies have 'hijacked patent policy both in the United States and globally'.[83] This is not surprising: that industry has been described as an 'archetypical patent-sensitive industry'.[84] It is understandable, therefore, that it would push in whichever way it can to get high patent protection in as many markets as possible. However, the costs and restrictions imposed by the 'one-size-fits all' approach of TRIPS means that high patent protection levels—ostensibly adopted for the benefit of commercial pharmaceutical research—will be imposed on all other industries that rely on patents.[85]

There is a relatively short list of industries generally considered to be highly patent-sensitive. The list may include chemicals and many types of laboratory instruments;[86] and organic chemicals, plastic chemicals, and steel mill products.[87] This classification goes back in part to Mansfield's studies of the field, in which he found that while 90% of pharmaceutical innovations were dependent on patent protection only about 20% of chemical, electronics, and machinery innovations were patent-dependent.[88] Beyond those limited fields, controversy concerning the role and impact of patents on innovation quickly emerges. Do computer software and online commerce benefit more from patents than the aggregate cost of obtaining, enforcing, and defending against patent infringement claims, especially those owned by non-practising entities?[89] This question is front and centre in a number

[82] Nesheiwat (n 81) 393–4. [83] Cheng (n 80) 32. [84] Benoliel and Salama (n 70) 267.

[85] MW Carroll, 'One Size Does Not Fit All: A Framework for Tailoring Intellectual Property Rights' (2009) 70 Ohio State LJ 1361–434; JH Reichman and D Lange, 'Bargaining Around the TRIPS Agreement: The Case for Ongoing Public-Private Initiatives to Facilitate Worldwide Intellectual Property Transactions' (1998) 9 Duke J of Int'l and Comparative L 11–68 at 50.

[86] KE Maskus, 'Lessons from Studying the International Economics of Intellectual Property Rights' (2000) 53 Vanderbilt L Rev 2219–39 at 2232; Gervais (n 78) 523.

[87] Cheng (n 80) 35.

[88] E Mansfield, 'Patents and Innovation: An Empirical Study' (1986) 32(2) *Management Science* 173–81; E Mansfield, M Schwartz, and S Wagner, 'Imitation Costs and Patents: An Empirical Study' (1981) 91 The Economic J 907–18; Cheng (n 80) 33.

[89] In 2013, New Zealand voted to ban patents on certain forms of software. See J Mullin, 'In historic vote, New Zealand bans software patents: patent claims can't cover computer programs "as such"', Ars Technica, 28 August 2013, <http://arstechnica.com/tech-policy/2013/08/in-historic-vote-new-zealand-bans-software-patents/>.

of both developed and developing countries.[90] Proposals to recognize differences have been made in the United States: if the legislator is unwilling to separate industries by applying different standards, perhaps courts can.[91] In a developing country, implementing a *single patent policy for all industries*—as is facially required by TRIPS—may thus be structurally suboptimal.

Software start-ups have emerged in many countries from gaming to various cloud-based services. Local knowledge in each country and social networking could help launch this type of intermediation in several countries. While the United States and other Western powers are stuck due to heavy lobbying constraints in the way that they can improve their current IP framework, developing countries can do better and grow certain industries faster. The negative role that patents may play (in aggregate) in software and online business are increasingly well documented. Problems arise because multiple patents—sometimes hundreds—can apply to a single application (eg for e-commerce), because patent laws do not typically require full disclosure of the code that is—indirectly at least—protected by the patent; and finally because the term is seen by many as too long for this type of technology because, at the expiry of the patent (twenty years after filing), the protected software will likely be obsolete and unlikely, therefore, to lead to follow-on or incremental innovation.[92] This suggests a cautious approach, which can be implemented by applying proper patentability standards.

Hence, while TRIPS applies uniform patentability criteria, which a country can define (within reason) to meet its own needs,[93] the question whether it makes sense to treat all industries the same should be on any comprehensive innovation agenda. As with trade policy generally, a form of 'discrimination' based on the nature of the industry concerned would be justified if one could develop a proper metric to measure whether and how innovation outcomes are achieved. It would still have to be defensible within a contextual interpretation of TRIPS obligations.[94] An inventory of state practice would likely show that courts and in some cases laws themselves treat different industries differently in various contexts (compulsory licensing in patent and copyright, patentable subject matter, etc).[95]

Beyond those patent policy considerations, it takes relatively little to generate growth in software and book publishing and even in music, where digital sales are picking up and allowing individually published songwriters and self-promoting

[90] SK Shrestha, 'Trolls or Market-Makers? An Empirical Analysis of Nonpracticing Entities' (2010) 110 Columbia L Rev 114–60.

[91] DL Burk and MA Lemley, 'The Patent Crisis and How The Courts Can Solve It' (2010) 23 Syracuse Science and Technology L Reporter 1–22.

[92] J Bessen and MJ Meurer, *Patent Failure: How Judges, Bureaucrats, and Lawyers Put Innovators at Risk* (Princeton University Press, 2009).

[93] L Petherbridge, 'Intelligent TRIPS Implementation: A Strategy for Countries on the Cusp of Development' (2010) 22 U of Pennsylvania J of Int'l Economic L 1029–66.

[94] Frankel and Gervais (n 19).

[95] In copyright, it is common to treat different categories of works differently. TRIPS does not contain an obligation like Art 27.1, which obligates WTO members to make patents 'available for any inventions, whether products or processes, in all fields of technology'. An example of differential treatment would be section 3(d) of the Indian Patents (Amendment) Act 2005 (Act No 15 of 2005), ostensibly designed to tackle certain forms of ever-greening in the pharmaceutical context.



artists to support a living outside of major 'record deals'. A number of developing countries, from Namibia to Nepal, have realized the need to support a fledgling professional 'creative class' and to build and supervise well-managed, transparent author collectives to represent them *vis-à-vis* major users.[96] The involvement of local composers, songwriters, and artists in the governance of such collectives is key in ensuring that collectives attain and maintain effectual levels of (a) the credibility *vis-à-vis* users needed to get them to license their use of protected content; and (b) the transparency *vis-à-vis* users and right holders needed for licensing and to have support from all stakeholders. Transparency and credibility will also be required when attempting to negotiate agreements with 'sister' organizations in other territories.

Copyright-related industries such as book and music publishing may be able to develop with less developed technological infrastructure and financial support. They depend of course on having domestic creators that produce 'content' that people want to listen to/watch or read, and on the existence of a viable marketplace. Enforcement must be calibrated with that in mind. Foreign authors may be able to make enough revenue from their home countries to continue to work and even export to countries with a less developed legal market. For authors in countries suffering from the lack of a viable marketplace, the situation is much harder, as they will depend on foreign income and markets which will presumably be harder to reach, even online.[97]

## III. Calibrating Towards Innovation

Thomas Friedman put it well when he wrote:

> Wealth in the age of flatness will increasingly gravitate to those countries who get three basic things right: the infrastructure to connect as efficiently and speedily as possible with the flat world platform, the right education programs and knowledge skills to empower more of their people to innovate and do value-added work on that platform, and, finally, the right governance—that is, the right tax policies, the right investment and trade laws, the right support for research, the right intellectual property laws, and, most of all, the right inspirational leadership.[98]

In this chapter, obviously I cannot address the whole host of education, tax, and other measures that a country might wish to consider as it (re)implements TRIPS in a calibrated fashion to maximize innovation potential while minimizing welfare impacts. Education, for example, is essential to create and improve intellectual capital and absorptive capacity. Clearly, there are myriad major innovation-related

[96] A partial inventory of collective management systems can be found in D Gervais (ed), *Collective Management of Copyright and Related Rights*, 2nd edn (Kluwer Law, 2010).

[97] SA Pager, 'Accentuating the Positive: Building Capacity for Creative Industries into the Development Agenda for Global Intellectual Property Law' (2012) 28(1) American U Int'l L Rev 223–94.

[98] Friedman (n 30) 329.

policy tools to consider beyond IP rules. Yet IP policy can be designed to use two potentially powerful tools. The first is a focus on the creation or reinforcement of processes that lead to *spillovers*, because such spillovers tend to generate better innovation outcomes. A second tool, which is more institutional in nature, is to encourage the formation or help the development of *clusters* of industry, venture capital, and researchers (especially higher education). Governmental support may take many forms, from appropriate IP rules to infrastructure to financing to educational and fundamental research resources. While I cannot offer a full picture of both tools here, it does seem useful to point out how these tools might be used as countries aim to develop calibrated IP policies.

## A. R&D spillovers

A number of endogenous growth models identify *R&D spillovers* as a central factor in promoting innovation.[99] Such spillovers 'eliminate the problem of diminishing returns to the aggregate knowledge of an economy, which was a main culprit for declining growth in Solow's model'.[100] Put differently, 'what one firm learns from another firm's innovation will improve the productivity of the first firm's R&D',[101] which suggests considerable yet possibly counter-intuitive positive externalities. The advantages of spillovers are the subjects of an abundant literature, including a rapidly increasing amount of empirical evidence.[102] Earlier research in the late 1980s in Canada, Japan, and the United States had already identified the existence and positive effects of R&D spillovers.[103] In Japan, where patent protection is often described as relatively weaker than in a number of other developed countries, Baumol had observed significant spillover effects and abundant innovation.[104]

The point of this section is not to survey or try to offer a complete overview of the literature, but rather to suggest that developing countries should consider *adopting strategies to maximize spillovers*, including by allowing entrepreneurs to consult patent applications and attend top trade shows.[105] An adequate and properly calibrated

[99] RM Solow, 'A Contribution to the Theory of Economic Growth' (1956) 1 Quarterly J of Economics 65–94; P Romer, 'Endogenous Technological Change' (1990) 98 J of Political Economy S71–S102.

[100] Cheng (n 80) 13.

[101] E Helpman, *The Mystery of Economic Growth* (Belknap Press, 2004) 34.

[102] See eg J Alcácer and W Chung, 'Location Strategies and Knowledge Spillovers' (2007) 53 Management Science 760; DB Audretsch and MP Feldman, 'R&D Spillovers and the Geography of Innovation and Production' (1996) 86 American Economic Rev 630; and AB Jaffe et al, 'Geographical Localization of Knowledge Spillovers as Evidenced by Patent Citations' (1993) Quarterly J of Economics 577.

[103] J Bernsteink, 'The Structure of Canadian Inter-industry R&D Spillovers, and the Rates of Return to R&D' (1998) 37(3) The J of Industrial Economics 15–328; A Goto and K Suzuki, 'R&D Capital, Rate of Return on R&D Investment and Spillover of R&D in Japanese Manufacturing Industries' (1991) 71(4) Rev of Economics and Statistics 555–64; AB Jaffe, 'Technological Opportunity and Spillovers of R&D: Evidence from Firms' Patents, Profits, and Market Value' (1986) 75(5) American Economic Rev 984–1001.

[104] WJ Baumol, *The Free Market Innovation Machine: Analyzing the Growth Miracle of Capitalism* (Princeton University Press, 2002) 42.

[105] RC Levin et al, 'Appropriating the Returns from Industrial Research and Development', *Brookings Papers on Economic Activity* (1987), <http://www.jstor.org/stable/2534454>.



increase in IP protection is more likely to lead to more innovation if there is more room left for spillover effects. This may sound somewhat counterintuitive (more IP leading to more 'imitation') but available data do bear this out.[106] Studies also suggest something that may be more in keeping with intuitive insights, namely that not all FDI is the same, and that spillovers will happen more frequently and be more beneficial when they are technology-related and include a significant technology-transfer component.

One can build here on the distinctions between countries and industries discussed in the previous sections to point to the linkages between FDI, a country's absorptive capacity and the relation between an investment and a cluster in the recipient country. An FDI on basic infrastructure in a country with a low absorptive capacity is unlikely to have research components and thus unlikely to produce or be of much relevance from a spillover perspective, though some useful knowledge may be transferred. An FDI or indeed an Outward Investment (ODI)[107] targeting a cluster—even a fledgling one—may, however, be much more productive even if the country has overall a fairly low absorptive capacity.

How does policy maximize spillovers? First, IP investment must be considered. Ideally, developing countries should incentivize the inclusion of R&D elements in appropriate FDI transactions and may wish to develop incentives to synchronize appropriate FDI with clusterization efforts. This could benefit both the investor and the recipient country.[108] The suggestion is not to restrict trade by imposing strict FDI rules; it is precisely the opposite, but accompanied by positive incentives.[109] Interestingly, available data suggest that it is 'foreign firms' *perception* of the strength of an IPR regime, rather than the actual strength of the regime within particular industries, that is responsible for determining the level of FDI'.[110] This suggests that countries should 'promote' their IP regimes and pay attention to third party assessments of such regimes.[111] According to Hirschman, perception plays a significant role also with domestic investors:

> [O]pportunities in underdeveloped regions tend to be seriously underrated by private investors at some stage in their country's development; similarly, at some other stage, the

[106] E L-C Lai, 'International Intellectual Property Rights Protection and the Rate of Product Innovation' (1998) 55(1) J of Development Economics 133–53 at 135.

[107] When the investment by a foreign firm is targeted towards a merger/acquisition and/or expansion of a foreign facility, information flows may be slower or different. This would be a matter worth further discussion but not here.

[108] NS Ling, 'Thailand's Ineffectual Intellectual Property Regime: A Trial And Error Approach to Encouraging Foreign Direct Investment Technology Spillover' (2011) 24 New York Int'l L Rev 99–167.

[109] R Mammone et al, 'Can Developed Nations Make a Fortune by Licensing New Technologies to the World's Poor?' (2012) 47 LES Nouvelles 115–20 at 116.

[110] G Halydier, 'A Hybrid Legal and Economic Development Model That Balances Intellectual Property Protection and Economic Growth: A Case Study of India, Brazil, Indonesia, and Vietnam' (2012) 14 Asian-Pacific L and Policy J 86–151 at 99.

[111] Some studies tend to support the view that the perception of stronger intellectual property in LDCs and developing countries may increase the volume of FDI. See eg Y Qian, 'Are National Patent Laws the Blossoming Rains? Evidence from Domestic Innovation, Technology Transfers, and International Trade Post Patent Implementations in the Period 1978–2002' in NW Netanel, *The Development Agenda: Global Intellectual Property and Developing Countries* (Oxford University Press, 2009).

need for continued reliance on capital from aboard will be overrated. In both cases, perception lags behind reality: the economy of the underdeveloped region and the capacity to raise industrial capital domestically have grown, but institutional inertia and past habit make it hard to take advantage of these changes or even to notice them.[112]

This strongly suggests the need to establish formal and/or informal feedback loops to monitor changes in domestic capacities in established clusters while avoiding policy short-termism. It also implies that calibration is a continual process because innovation can rarely be left on autopilot for a prolonged period of time without downside risks. For investors, both domestic and foreign, good innovation governance requires governments to provide conditions for businesses to thrive domestically and across borders. Yet, perception matters for other stakeholders and the public. Hence, innovation governance is more than simple business development, and heads of governments are not CEOs. When seen correctly through a more complete prism of human *and* economic development, governance should therefore allow civil society to play a role in discussions about innovation in the broader national public interest.

Naturally, other, broader variables such as the overall political situation, economic freedom, natural resource allocation, technological absorptive capability, WTO accession, and regional instability also play a role.[113] Maskus notes that the 'multinational enterprises are more likely to transfer proprietary information to local affiliates or partners that are themselves engaged in adaptive R&D, suggesting that policies to encourage domestic innovation are complementary to inducing inward technology flows'.[114] He then observes that 'elasticity of FDI with respect to patent seems to rise with the abundance of local human capital'.[115] This would explain why countries with very low absorptive capacity (such as many LDCs) do not show measurable gains when introducing higher levels of IP rules without a series of accompanying and parallel measures on several different fronts.

If FDI is often mentioned first as a way of increasing domestic innovation capabilities, it is not the only available tool. There are four main methods to encourage transfer technological knowledge: licensed technology transfer, unauthorized imitation ('piracy'), patent disclosure, and reverse engineering.[116] All except the second one are legal. The first method, which includes but is not limited to FDI transactions that contain technology transfers, is voluntary; the other three are not, though arguably patent disclosure is consented to when one applies for a patent, because publication of the application after eighteen months is part of the patent bargain. Developing countries can help develop patent information systems, informing their local entrepreneurs of published patent applications or at least

[112] AO Hirschman, 'Political Economy and Possibilism' in J Alderman, *The Essential Hirschman* (Princeton University Press, 2013) 19.

[113] Halydier (n 110) 98 at n 64; Maskus, Fink, and Primo Braga's work points in a similar direction. See KE Maskus, 'The Role of Intellectual Property Rights in Encouraging Foreign Direct Investment and Technology Transfer' (2004) 9 Duke J of Comparative and Int L 109–61; Primo Braga and C Fink, 'The Economic Justification for the Grant of Intellectual Property Rights: Patterns of Convergence and Conflict' (1996) 72 Chicago-Kent L Rev 439–61.

[114] Maskus (n 79) 171. [115] Maskus (n 79) 171. [116] Cheng (n 80) 48.



making it easier for them to find them. They can provide information on and ensure that their laws permit reverse engineering, as do laws in Europe and the United States for example.[117]

Developing countries wishing to nurture strategic spillover effects may also use *antitrust/competition laws* to limit the negative welfare impacts of higher IP protection. In areas in which they are trying to encourage FDI, however, rules that restrict licensing practices (I do not mean to imply abusive practices such as those listed in Article 40 of TRIPS) may discourage outsourcing and reduce technology transfers. Cheng goes a step further, arguing that 'the ability to circumvent antitrust restrictions can be said to be an internalization advantage that steers the multinational firm to keep production in-house'.[118] Like many other aspects of innovation policy, it is a balancing act. A possible approach would be to use the laws of more industrialized countries as a model and then ensure proper administrative application through training and judicial review.

A related area in which intellectual property may be excessive is access to *essential technologies*.[119] I would not limit the definition of essential technologies to patents included in standards, though this is a key point.[120] One could extend the notion of essentiality using a human rights lens to building blocks of free expression, for example.[121] It also informed the adoption of TRIPS Article 31*bis*, where medicines were deemed 'essential' to deal with major public health crises.

Compulsory licensing generally is subject to two fairly similar caveats. First, any know-how that would be transferred with a voluntary licensing agreement would not be part of a typical compulsory licensing scenario. There are cases of course where there is very little if any relevant additional know-how not disclosed or otherwise 'enabled' by the patent subject to the compulsory license. Secondly, a firm subjected to a compulsory licence may withdraw, delay, or cancel other investments in the country. These are factors to bear in mind before issuing a compulsory licence. Their relative weight in the decision will vary enormously in each case. Then there is dissemination of information generated by the IP system itself, including patent applications.

## B. Clusters and growth poles

A concrete, positive, and powerful way to develop spillovers is to foster the establishment of *clusters*. As with spillovers (as noted above the topics are closely related), there is a vast literature on clusters. And like the previous subsection, my aim is not to provide a full picture but rather to suggest that clustering probably should

[117] P Samuelson and S Scotchmer, 'The Law and Economics of Reverse Engineering' (2002) 111 Yale LJ 1575–1663; TM Evans, 'Reverse Engineering IP' (2013) Marquette Intellectual Property L Rev 61–101.

[118] Cheng (n 80) 49–50.

[119] AL Brown, *Intellectual Property, Human Rights and Competition* (Edward Elgar, 2012).

[120] JM Mueller, 'Patent Misuse through the Capture of Industry Standards' (2002) 17 Berkeley Technology LJ 623–84; D Zhang, 'Observations from a TRIPS Perspective: Do We Need a Traditional Medicine Exemption for Patent Standards?' (2011) 13 Oregon Rev of Int'l L 305–15.

[121] Brown (n 119) 73–5.

be part of an innovation policy discussion. I hasten to add at the outset, however, that while spillovers consider how information is exchanged and is thus a topic closely tied to IP, clusters require much more broad discussion involving several aspects of industrial policy. Clusters are more likely to develop successfully within a well-calibrated IP framework, the application of which in practice may in fact be guided by behavioural patterns within the cluster.[122]

Clusters have been described as ways of organizing and maximizing both structured research efforts and serendipitous advances, the latter being often the most important. Available data and studies suggest that clusters involving *private capital, higher education resources relevant to the area, and government support* are a successful form of industrial policy.[123] Education reform is a fairly long-term prospect. However, it can be jumpstarted in a cluster development strategy by establishing or funding chairs, laboratories, and research centres meant to attract qualified foreign researchers, in particular nationals of the country concerned that are successful overseas. The selection of appropriate recipients for such funding should be merit-based. Priority should be given to attracting senior researchers near their research peak and highly promising junior researchers. This should be combined with awards to recognize successful national researchers and innovators already working in the country.

Successful clusters have mostly been organically seeded (by an industry) and close to at least some risk/venture capital resources and, more importantly perhaps, higher education and research facilities. They often depend on properly calibrated IP though not always. For example, clusters benefit from more information-sharing, thereby enhancing opportunities for spillover effects, which would support a more limited role for (or at least enforcement of) patents and copyright in scientific articles when used by competitors for experimental purposes and/or to develop incremental/follow-on innovation.[124] I return to this at the end of this section.

Beyond debates over the form of incentives, clusters have the advantage of being focused on one industry or area, though that area (technology) can evolve and change over time, just as Silicon Valley has moved from computers to cloud-based services over the past three decades.[125] Clusters can be used by domestic companies of course, but also to attract FDI with a significant R&D component by

[122] See eg in terms of the enforcement of covenants not to compete: A Hyde, *Working in Silicon Valley: Economic and Legal Analysis of a High-Velocity Labor Market* (ME Sharpe, 2003); RJ Gilson, 'The Legal Infrastructure of High Technology Industrial Districts: Silicon Valley, Route 128 and Covenants Not to Compete' (1999) 74 New York University L Rev 575; DP Cooper, 'Innovation and Reciprocal Externalities: Information Transmission via Job Mobility' (2001) 45 J of Economic Behavior and Organization 403; and C Arup, 'What/Whose Knowledge? Restraints of Trade and Concepts of Knowledge' (2012) 36 Melbourne U L Rev 369.

[123] D Gervais, 'Of Clusters and Assumptions: Innovation as Part of a Full TRIPS Implementation' (2009) 77(5) Fordham L Rev 2353–77, <http://bit.ly/15mlbgG>.

[124] This does not mean that incremental innovation should be freely marketable without regard to the underlying patent. That is a separate debate, which should be left to market forces unless an abuse of right has been demonstrated to exist in a particular case.

[125] Gilson (n 122); AL Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* (Harvard University Press, 1996) 1–4.



branches of multinational corporations increasingly interested in having a broader geographical R&D footprint. This has been done successfully in various parts of the world.[126] In an age where capital and innovation are mobile, clusters can serve to attract the best minds in both research and business. Often, however, this will also require infrastructural investments by governments (roads and transportation, stable electrical supply; access to the internet, etc). As Professor Hargadon noted, it is a good strategy in this context to 'link people, ideas, and objects together in ways that form effective and lasting communities and technologies'.[127] A clear advantage of clusters is the geographic proximity of players, from venture capitalists who might prefer to be closer to their 'investment' and offer guidance in addition to financing; to the various opportunities to interact both formally and informally with others in the industry.[128]

A cluster development policy should include a combination of insights by economists such as Hirschman and Perroux, and work on National Information Systems (NIS) by Bengt-Åke Lundvall et al.[129]

Hirschman suggested that an optimal policy should consider import-substituting industrialization and the development of domestic consumption.[130] A country with a large domestic market may have an easier time launching its own innovation-based enterprises and be less dependent on favourable international trade rules. Countries with a larger population are also more likely to be more diversified. Yet, to translate innovation into commercial ventures requires a host of factors that small countries can also provide. Indeed, sometimes it may be easier for them. Education, infrastructure, legal reforms, and the formation of industry-specific clusters should be front and centre.

Hirschman, again building on Perroux's work, suggested that 'growth poles' (a notion closely related to clusters) can provide private and/or public support if and when resources that a user (typically one plant or industry) has developed prove insufficient.[131] Governments can intervene in particular when there is a deceleration of momentum (often accompanied by a lack of resources).

[126] For a discussion of China and India, see Gervais (n 123). Silicon Valley in the United States is discussed in the previous note. On Latin America, see E Giuliani et al, 'Upgrading in Global Value Chains: Lessons from Latin American Clusters' (2005) 33 World Development 549. And on Italy, see R Rabellotti et al, 'Italian Industrial Districts on the Move: Where Are They Going?' (2009) 17 Euro Planning Studies 19. On Canada, see Bernsteink (n 103); Goto and Suzuki (n 103); Jaffe (n 103).

[127] A Hargadon, *How Breakthroughs Happen: The Surprising Truth about How Companies Innovate* (Harvard Business School Press, 2003); JC Stratton, 'Idea Work Style—A Hypothetical Web-Based Approach to Monitoring the Innovative Health of Organizations' in JT Yao and P Lingras (eds), *WSS 2003: WI/IAT 2003 Workshop on Applications, Products and Services of Web-based Support Systems* (Halifax, 2003) 69 at 70.

[128] P Lee, 'Transcending the Tacit Dimension: Patents, Relationships, and Organizational Integration in Technology Transfer' (2012) 100 California L Rev 1503 at 1521–9.

[129] For a brief review of the literature on National Information Systems, see Gervais (n 123) 2362–5.

[130] AO Hirschman, 'A Generalized Linkage Approach to Development, with Special Reference to Staples' in M Nash (ed), *Essays on Economic Development and Cultural Change* (University of Chicago Press, 1977) 65.

[131] Hirschman (n 130) 68.

However one parses the data, clusters and growth poles do seem to work. Perroux noted that there

> has never been a historical case of economic evolution where one does not observe clustering, cumulative, and propulsive effects that generate development. History has handed down its verdict: there is no other way of development.... Following the attraction phase, the expansion phase manifests itself through the flow of goods, of investments, and of information.[132]

In fact, when countries, especially smaller or somewhat less industrialized countries have failed in attracting R&D despite significant governmental support, the lack of a key element of a successful cluster can usually be observed. Basic research may need to be happening and that research is generally not self-sustaining. For example, pharmaceutical research will need support from higher education or similar entities able to perform state-supported basic research in chemistry, genetics and/or biology.

Clusters may have other positive effects. They can provide *de facto* or even formal standards to emerge with a cluster that may then affect an entire industry.[133] This can be facilitated when trade associations are formed, which may happen naturally in a cluster of similar or related industries. As a commentator noted in that regard:

> The social value of developing standards far exceeds the social value of merely providing a forum for discussion for experts in a standard developer's field. The need to decide on a standard forces the members of the standards development organization, each of whom may have relevant information about some aspect of the matter at hand, to focus on the implications of their learning instead of merely sharing their learning. The standard development process coordinates the learning of the members and pushes that learning to resolution, if only in the form of suggestions.[134]

While cluster formation and development seems a promising avenue to pursue, a number of open questions and challenges must be acknowledged, though they can only be mentioned briefly here. First, one cannot draw a smooth isoquant here for there is not a 'perfect' admixture of public and private funding and/or other incentives that can or should be used in each and every situation. Secondly, there remain significant questions on how to build optimal interfaces and especially the relation between clusterization and institutional design (and the impact of changes on extant structures), which I cannot fully describe or address here.[135] Thirdly, if public funds are used in a way that leads them to private appropriation

[132] F Perroux, 'The Pole of Development's New Place in a General Theory of Economic Activity' in B Higgins and D Savoie (eds), *Regional Economic Development: Essays in Honour of François Perroux* (Unwin Hyman, 1988) 48–76 at 58–9.

[133] DJ Teece, 'Information Sharing, Innovation, and Antitrust' (1994) 62 Antitrust LJ 465 at 473–5.

[134] RH Heidt, 'Damned for Their Judgment: The Tort Liability of Standards Development Organizations' (2010) 45 Wake Forest L Rev 1227 at 1267–8.

[135] JR Hollingsworth, 'Doing Institutional Analysis: Implications for the Study of Innovations' (2000) 7(4) Rev of Intl Political Economy 595–644.



without the corresponding creation of public goods and increases in welfare, there may well be a negative reaction from taxpayers. Conversely, there is no guarantee that private funding will be available to continue work begun on the basis of public funds. This means that governments should have a highly dynamic approach but also that they have the right to experiment, preferably with a light touch to allow clusters to form and begin to grow organically. Yet in spite of the inevitable muddling through in cluster formation, support for organically seeded clusters should form part of policies' designs to maximize domestic innovation.[136] 'Domestic' in that context does not mean geographically uniform, however, especially in a country with a big territory. The system of the growth poles and clusters is also—and perhaps more importantly—meant to reflect the fact that economic development does not spread itself evenly throughout space. Innovation tends to be concentrated in particular enterprises, the so-called propulsive industries.[137] Growth poles have the 'capacity to engender a dialectic of economic and social structures whose effect is to increase the complexity of the whole and to expand its multidimensional return'.[138] This means that a policy designed to maximize innovation need not be national. In fact, if it focuses as it should on growth poles, or clusters, the objective should be to allow a region to 'maximize the aggregate net product while attending the desired structure of the national economy'.[139]

Finally, clusters need to be able to share information (in part in order to generate the spillovers discussed above).[140] Information-sharing, through both formal and informal processes, should be part of the 'culture' of such clusters.[141] As part of technological progress within a cluster, knowledge not shared is equivalent to knowledge not generated.[142] Governmental support to make research available, whether using structures such as Creative Commons or otherwise, should be encouraged. In some cases, commercial publishing entities might also see an interest in participating in the formation and development of clusters.

## Conclusion

As policymakers navigate deeper in the calibration waters of TRIPS implementation as part of a national innovation strategy, they must also avoid the shoals of excessive IP, from patent trolls to patents preventing access to essential medicines to copyright and trademark excesses preventing free expression and other fair

[136] I am grateful to Dr Wilhelm Krull, Secretary General of the Volkswagen Foundation, for this insight.

[137] B Higgins, 'François Perroux' in B Higgins and D Savoie (eds), *Regional Economic Development: Essays in Honour of François Perroux* (Unwin Hyman, 1988) 31–47 at 42.

[138] Perroux (n 132) 49. [139] Perroux (n 132) 54–5. [140] Teece (n 133) 468–79.

[141] C Lawson and E Lorenz, 'Collective Learning, Tacit Knowledge and Regional Innovative Capacity' (1999) 33 Regional Studies 305.

[142] I am grateful to Dr Anne Glover, Chief Scientific Adviser to the European Commission, for this insight.

uses. To the Scylla of excessive IP, one must not run to the Charybdis of insufficient IP, however.[143] This is a process known as calibration.

This chapter has explained why calibration is both unavoidable and desirable. It then proposed ways to calibrate IP policy as part as a broader innovation strategy including a focus on the key role of spillover effects in generating both cumulative and breakthrough ('pioneer') innovation. An excellent best way to promote such spillovers, though one which would require a much longer explanation than can be provided in this chapter, is to help the formation and growth of clusters or poles of innovative industries.

[143] For example, excessive exceptions or recourse to compulsory licensing or antitrust restrictions are likely to discourage certain forms of FDI and may thus retard economic development. The focus should be on FDI transactions that include knowledge transfer and ideally a significant R&D component.