# INTELLECTUAL PROPERTY ISSUES FOR THE UNITED STATES AND JAPAN: DISPUTES AND COMMON INTERESTS

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## 1. Introduction

The protection of intellectual property rights (IPRs) remains at the forefront of international policy deliberations. Many developing nations are in the process of designing and implementing new regimes as required by the WTO Agreement on the Trade-Related Aspects of Intellectual Property Rights (TRIPS). Under TRIPS a number of disputes about IPRs have been the subject of panel decisions, with those disputes often arising between developed countries. Intellectual property laws and judicial interpretation of those laws continue to evolve in the developed nations as the dictates of technological change and competition place stresses on standard forms of protection. Furthermore, IPRs are integral to issues concerning the international provision of public goods. The controversies they engender are likely to increase in number and intensity, even as TRIPS becomes an accepted set of multilateral rules.

The United States and Japan share a broad commonality of interests in shaping the evolution of global IPRs over the medium term. The United States is the world's largest net supplier of intellectual creations and Japan takes a similar role with respect to transferring technologies to the industrializing nations of Asia. Thus, both nations would see enhanced abilities of their creative firms to earn higher returns on the international exploitation of new technologies and products as global standards are tightened.

However, there are interesting and important differences of opinion between the two nations. First, each country continues to complain about certain aspects of the other country's intellectual property regime, despite considerable convergence in those regimes since 1994. Second, the United States has recently taken actions that may reasonably be described as overly protectionist on any utilitarian grounds (Maskus, 2000a) and it is

doubtful that Japan would wish to emulate these standards. Indeed, each country can learn from the other as it wrestles with the tradeoff between innovation and diffusion that is inherent in IPRs. Moreover, developing nations may look to both models as they consider their own standards. For example, Japan's growth performance since the second world war may be attributed in part to its intellectual property system, which favored learning and diffusion over fundamental invention. Thus, developing countries may wish to model their systems more closely on the Japanese example.

## 2. Bilateral IPRs Issues

Overall there has been marked convergence in intellectual property standards between Japan and the United States since 1994. For example, as a component of the Japan-U.S. Framework Talks, in 1994 the two countries signed a pair of agreements that committed both sides to changes in their patent systems (Suzuki, 1997). As a result, Japan began permitting patent applications to be filed in English, ended third-party opposition proceedings prior to patent grant, accelerated patent examination procedures to obtain a disposition on applications within 36 months, and eliminated the threat of dependent-patent compulsory licenses except where anticompetitive practices are demonstrated. Japan adopted a revised patent law in 1999 that made it easier for plaintiffs to prove patent infringement in courts and gave judges more discretion over setting damages. The Japan Patent Office (JPO) is also working to reduce the examination period to 12 months by the end of the year 2000 (USTR, 2000).

For its part, the United States changed the term of patent protection from 17 years from the grant date to 20 years from the initial filing date. Japan had complained further

about the lack of an early publication system, which permitted the practice of "submarine patents", discussed below. In 1999 the United States enacted legislation for publication with 18 months of applications that had been filed abroad as well as in the United States (Katoh, 1997). However, the law provides filers the choice of preventing early disclosure if the applications are made only in the United States. This partial resolution of the problem remains a sticking point.

Implementation of the TRIPS requirements led to further convergence in intellectual property protection (Suzuki, 1997). Japan added certain rights to its patent and copyright laws, while extending the term of patent protection. Japan also clarified procedures for receiving utility model grants, removing the examination requirement and shortening protection to six years. This latter change placed the utility model system on a par with that in Germany and France; the United States has no such system. Finally, in response to an adverse WTO ruling in 1997, Japan provided retroactive copyright protection for pre-existing sound recordings in order to provide a full 50-year term, an issue of considerable interest to the United States.

Both Japan and the United States have signed the Copyright Treaty and the Performances and Phonograms Treaty, concluded under the auspices of the World Intellectual Property Organization (WIPO). In preparation for ratification of the Copyright Treaty, the Diet revised Japan's copyright law in 1999 to included criminal penalties for producing and distributing devices designed to circumvent copyrights in electronic transmissions (USTR, 2000).

Recent judicial decisions in Japan have further strengthened intellectual property protection and increased its harmonization with U.S. practices (Takenada, 1997). For

example, in a recent case the Osaka High Court elucidated a doctrine of equivalents, much like that recognized in U.S. courts, in finding for a plaintiff in a patent case.[1] This ruling significantly extended the range of equivalency that could be found to constitute infringement relative to prior Japanese procedure. As such it reflects a significant increase in patent scope. In another case, the Tokyo High Court took the unprecedented step of overriding a decision of the JPO in finding an issued patent to be invalid.[2] In another, the Japanese Supreme Court adopted the first sale doctrine, as developed by U.S. courts.[3] This doctrine limits the patentee's right to exclude parallel imports of products that it legally puts on the market to cases in which the patent owner imposes a territorial restriction on its buyers. In applying the U.S. permission of territorial restrictions, this decision sharply increased protection against parallel imports of patented goods into Japan.

Despite this tendency toward convergence, there remain differences in the national systems. In their most recent reports on foreign trade barriers, the trade authority of each country lists perceived problems with the intellectual property regime of the other. Following is a brief overview of these problems with accompanying commentary.

*2a. Japanese Concerns about the U.S. System*

In its review of American trade policies, the Ministry of International Trade and Industry (MITI) lists several problems with the U.S. intellectual property regime (MITI, 2000). One objection is that the United States uniquely retains its "first to invent" patent system, while the rest of the world follows a "first to file" system. The United States prefers to maintain this approach in the belief that it rewards the ultimate inventor and

[1] *Genentech Inc. v.Sumitomo Seiyaku K.K.*, 29 March 1996.
[2] *Fujitsu Ltd. v. Texas Instruments*, 10 September 1997.

also promotes voluntary disclosure of research results prior to patent filing by scientists and inventors. Indeed, it is primarily university researchers and small inventors who argue for retention of this system. However, the Japanese -- and other -- governments are concerned that the American approach raises a threat of uncertainty for their firms. Specifically, in conjunction with the partial absence of early disclosure and the prior practice of beginning a patent term on the date of grant rather than filing, the U.S. system permitted the existence of "submarine patents". In this situation, an applicant could indefinitely delay processing of its application and have the patent granted after a rival firm merchandised the same technology, often much later. The United States has moved partially to rectify this problem by providing the limited early disclosure mentioned above and beginning the term of protection from the filing date, as required by Article 33 of TRIPS. However, this change in procedure does not apply to patent applications submitted before June 7, 1995, raising the continuing specter of hidden patents coming to light. Moreover, the U.S. Patent Reform Act of 1999 relaxed many of the limitations on patent term extensions, suggesting that confidential patent applications, particularly in the pharmaceutical and biotechnology sectors, could remain hidden and potent for some time. An additional problem with the first-to-invent system is that rivals often must invest considerable sums in determining the identity of the first inventor. This can be particularly costly when a new invention must attain license rights from a number of prior inventors of overlapping technologies.

It has been observed frequently that the U.S. Patent and Trademark Office (USPTO) is increasingly overwhelmed with patent applications, making adequate examination procedures difficult (Maskus, 2000a). This problem, stemming from an

[3] Judgment of the Supreme Court, 1 July 1997.

onslaught of applications for business method patents in internet distribution technologies, is thought to result in patents issued in error due to the failure by examiners to take prior art into account. Indeed, examiners tend to rely on listings of prior art solely in the applications themselves rather than engage in an independent search. Such a system could be rectified by an adequate opportunity for re-examination when third parties contesting validity of patents. However, the U.S. system places severe limitations on the rights of third parties to challenge patents (Janis, 2000). In the U.S. Patent Reform Act of 1999, Congress failed to relax these limitations in any significant way and continued to deny third parties any appeal of re-examination findings issued by the USPTO. Thus, this system erects barriers to rival inventors who believe that patents have been issued in error.

The Japanese government retains some concerns over the operation of Section 337 of the U.S. Tariff Act of 1930. Numerous procedures for enforcing this law were found to be in violation of national treatment obligations by the GATT in 1989.[4] Virtually all of the discriminatory elements of the law were removed in the Uruguay Round implementation legislation in 1995. However, the U.S. International Trade Commission could effectively discriminate against imports in the designation of its "target date" for final determination in each investigation, for no such date exists in cases involving domestic infringement. The EU requested consultations on this issue in January 2000 and Japan is monitoring its progress (MITI, 2000).

[4] United States -- Section 337 of the Tariff Act of 1930, complaint by the European Economic Community, adopted 7 November 1989, BISD 36S/345.

Finally, the Japanese government contends that the existence and use of Special 301 in U.S. trade law poses dangers of unilateral assertion of intellectual property standards in ways that could be inconsistent with multilateral norms.

*2b. U.S. Concerns about the Japanese System*

As recently as 1999 Japan remained on the Special 301 "Watch List" issued by USTR, but does not appear on it in 2000. However, the United States continues to complain about the narrow scope and interpretation of Japanese patent claims, the practice of "patent flooding" around invention patents, the slow pace of patent litigation in Japanese courts, the inability to compel effective compliance with discovery procedures, and inadequate safeguards for confidential information produced in discovery (USTR, 2000; Suzuki, 1997). The introduction of a doctrine of equivalents into Japanese jurisprudence, as mentioned earlier, could overcome objections regarding narrow patent claims (Katoh, 1997). Patent flooding is facilitated by various characteristics of the Japanese patent system. Some of these characteristics have been removed or modified, such as pre-grant opposition and low filing fees. Japan is modifying others, including ineffective judicial remedies and compulsory cross-licensing. Nonetheless, as one observer noted, the massive numbers of patent applications in Japan compared to the United States reflects, to an important extent, the nature of intense competition for small-scale innovation in Japan (Katoh, 1997). In that context, it is debatable whether continual broadening of patent scope is in Japan's interest, a point I return to in a later section.

According to USTR, Japan has made considerable progress in reducing copyright piracy. The United States calls for Japan to amend its Civil Procedures Act to award punitive damages rather than actual damages and to provide for effective evidence

collection (USTR, 2000). It also urges Japan to strengthen its anti-circumvention law for devices aimed at defeating copyrights on the internet.

It should be noted that, at least in one area of copyrights, Japan has stronger standards than does the United States. In particular, Japan provides extensive moral rights for authors and artists, whereas the United States does not. This difference stems from Japan's tradition of emulating German and French intellectual property law, which distinguishes between an author's "personal rights" (moral rights) and his "economic rights" (copyrights). The U.S. tradition of treating IPRs as utilitarian devices recognizes only the latter rights.

The U.S. government acknowledges the revisions made in 1997 to Japan's Trademark Law, which accelerate the registration of rights, strengthen protection of well-known marks, and increase penalties for trademark infringement (USTR, 2000). However, USTR claims without explanation that protection of well-known marks remains weak, an interpretation that is rejected by one Japanese expert (Katoh, 1997).

A continuing irritation to the U.S. government is Article 82(2) of Japan's Constitution, which requires that all court proceedings be open to the public. This requirement erects a roadblock to maintaining confidential trade secrets in seeking intellectual property protection. The United States considers this to be unacceptably weak and urges Japan to reform its protection of trade secrets, which would require Constitutional amendment. The Japanese government responds that its system is in compliance with TRIPS Article 42, which requires a means to protect confidential information except where it would be contrary to existing constitutional requirements.

The United States continues to press Japan to increase its number of intellectual property lawyers and judges in order to make litigation more effective and expeditious. In response, Japan has instituted additional training programs and new legal curricula focusing on IPRs. However, Japan has a long way to go to catch the United States. As of 1997, Japan had 16, 368 lawyers (13 per 100,000 population) in comparison with the U.S. supply of 906,611 lawyers (340 per 100,000). The United States had 15 times as many judges (Millhaupt, 2000), with the discrepancy in the area of intellectual property presumably being even larger.

In reviewing this history it is fair to say that while both nations continue to strengthen their protection of intellectual property, there has been substantive convergence of Japanese standards to U.S. norms. Surely this reflects the evolution of Japan from a technology follower to a nation with enterprises that innovate on a global scale (Maskus and McDaniel, 1999). Both countries have mature regimes and the differences between them are, in the main, small irritants rather than major conflicts.

Nonetheless, Japan's system retains features that make it less protective than the American regime, which has been described as "protectionism unbound" (Maskus, 2000a). The wisdom of the U.S. system may be questioned on the grounds of its, *inter alia*, recognition of broad patents on biotechnological inventions and research tools, awarding of business-method patents with non-existent standards for non-obviousness, and privatization of data already in the public domain through the protection of databases. Japan should think clearly about whether it wishes to emulate these standards.

## 3. Interests in TRIPS Implementation

Developing countries were supposed to meet their obligations under TRIPS (except in the area of pharmaceutical and biotechnology patents) by the beginning of 2000, though many have been unable to implement all dimensions of the required standards. The least-developed countries have until the year 2005 to do so. Thus, the short-term policy challenge is to monitor and influence the extent of implementation.

*3a. Short-term and Long-term Effects of Stronger Standards*

Both the United States and Japan have export interests in seeing stronger standards implemented and enforced in developing countries, particularly in East Asia as regards Japan. The United States remains, by far, the largest net recipient of royalties and license fees earned on intellectual property (Maskus, 2000a). While Japan is a net payer of such fees overall, it earns substantial amounts from its licensing of intellectual property in the newly industrializing economies. Japan also transfers considerable amounts of technology to developing Asia through both exports of capital goods and investment in manufacturing facilities. The economic returns to such activities should rise sharply as stronger IPRs are implemented.

To see this, consider an updating of the results in McCalman (2001), who analyzed 1988 bilateral patent statistics for 29 countries. He assessed the implicit price of technology transfers through patent portfolios as it is influenced by patent rights. In particular, he inferred econometrically the value of patent rights in each country by relating local parameters to the decision to patent. McCalman employed the Ginarte-Park (1997) index of patent rights to capture the patent changes TRIPS requires country by country. For example, many developing countries must improve enforcement, remove

working requirements, provide for reversal of burden of proof, and lengthen patent duration. These components are identified in the patent index and their impact on patent value could be estimated with dummy variables. The resulting coefficients were applied to bilateral patent stock ownership to compute the anticipated rise in patent rents. This is inherently a static calculation based on an unchanged 1988 patent portfolio.[5]

In Table 1 I list selected estimates that I have modified from his computations, using GDP deflators and exchange rates to update the figures to millions of 1995 dollars. As may be seen, the United States would be a net recipient of higher patent rents on its 1988 international portfolio from all countries, with a total net inward transfer of $5.7 billion. This figure may be compared to the total U.S. net receipts of royalties and license fees in 1995 of approximately $20 billion. Germany and Switzerland would also be net recipients among the countries listed. While patents owned by Americans in Japan would have had higher value of some $690 million, Japan would actually be a net recipient from all other countries combined. Japan's inward transfers are particularly large from the two Asian developing economies represented, Korea and India. This finding reflects the large net ownership by Japan of patents registered in Korea and India (in comparison with the reverse ownership), combined with the significant strengthening of patent regimes that would be required of those nations relative to their 1988 systems.

These figures suggest that the short-run impact of TRIPS would be to transfer considerable ownership rents to firms in developed countries, especially the United States but including Japan as well.[6] Over the long term, however, TRIPS may be expected to

[5] Currently there are far more patents owned internationally, suggesting that the figures presented are significant underestimates of potential rent flows.

[6] Put another way, TRIPS may be considered an outstanding exercise in strategic trade policy on the part of the United States.

increase international flows of high-technology trade, FDI, and licensing (Maskus, 2000a). On past trends, Japan should be a major participant as an exporter of technology through these channels, particularly to industrializing East Asia. In this context, there is both a direct impact of stronger IPRs on technology transfer and an indirect impact through subsequent growth increases, which would rebound into higher demand for U.S. and Japanese products.

While any such calculations are speculative, consider the implications of the econometric results reported in Maskus (2000a). In Table 2 I make an educated guess about the expected increase in the Ginarte-Park patent index that would prevail after TRIPS implementation in selected Asian nations. Some of these increases are large relative to prior protection levels (compare GP2 with GP1 for India, for example), suggesting that the results of econometric estimation should be treated with caution.

The underlying econometric models found that, particularly in large developing economies, the impacts of stronger patent rights on manufacturing imports from all countries and FDI and licensing flows from the United States would be statistically and economically significant. For example, the trade model suggested that Chinese imports of manufacturing goods would rise by $16 billion, or 15 percent of 1995 manufacturing imports. Imports of high-technology goods would rise by 12 percent. The stock of FDI assets owned in manufacturing by American multinational enterprises would rise by $657 million, or 19 percent of its 1995 level. Other flows may be read in similar fashion. The implausibly large proportional increases in FDI assets in Indonesia and licensing fees in Indonesia and India stem from the large simulated increase in patent protection in those countries, combined with high estimated elasticities across developing nations.

These figures suggest that U.S. firms could enjoy considerable increases in demand for goods and technology in large developing economies as a result of TRIPS. Assuming these estimates hold also for Japanese activity, which is at least as large as American activity in these countries, the same may be said for that nation's firms. Thus, over the longer term, TRIPS promises export gains and cost reductions through FDI. Moreover, such increases in technology absorption in developing economies may be expected to raise their growth performance. Maskus (2000a) computes that China's average TFP growth could rise from 3.5% to 4% or higher as a result of the higher imports of machinery and FDI.

*3b. Subtleties in Implementation*

Despite this long-term commonality of interests, it seems fair to say that the United States would place greater emphasis than Japan on implementation in developing countries of strong standards of protection. In part, this difference in views could be strategic in that American firms on average have more global technology to protect than do Japanese firms. Moreover, the extensive production networks Japan has built in Eastern Asian countries could benefit from easier learning and diffusion possibilities, subject to observing minimum TRIPS standards, than would be available if protective American standards were established widely.

In part, it also could reflect recent history, in that Japan's patent system in place from the 1950's until 1994 embodied features that promoted diffusion and incremental innovation, with a positive impact on TFP growth (Maskus and McDaniel, 1999). With that background, Japanese officials might be expected to be more sympathetic with a phased implementation of successively stronger standards as spelled out in Maskus

(2000a). In particular, Japan's positive history with utility models provides a useful model for technology-follower nations as they select new patent regimes. Japan also seems more willing to undertake the best-efforts technology-transfer commitments reached in TRIPS on the part of developed economies.

More broadly, the task in selecting IPRs standards in developing countries is to promote dynamic competition and information diffusion through the use of fair means. Thus, for example, countries might be expected to adopt narrow patent claims, pre-grant opposition, early disclosure, limited use of compulsory licenses, exclusion of computer programs from patentability, and permission of reverse engineering of computer programs. Not all of these policies would be in Japan's economic interests on a sectoral basis. Patents for computer programs and video games might be of particularly interest for Japan's information technology sector. Again, however, given its extensive international production and design networks, there may be some interest in avoiding patents outside the developed countries in order to promote interoperability among national affiliates and associated programming enterprises. This observation is consistent with Japan's copyright law, which is silent on the issue of reverse engineering of computer programs, thereby permitting it under a "private use" defense. Japan's patent law also recognizes a free right to use patented material for experimental and research purposes.

*3c. Issues for TRIPS Revision*

As has been noted elsewhere, TRIPS itself is subject to revision through commitments to revisit certain issues, though extensive changes are unlikely (Maskus, 2000b). Two issues of particular relevance arise. First, countries are committed to

review the operation of Article 27 regarding exemptions from patent protection for certain biotechnological inventions and required protection for plant varieties. Both the United States and Japan have dynamic interests in strong protection for biotechnology and plant varieties; indeed, Japanese residents applied for more plant variety registrations in 1996 than did American residents (Maskus, 2000a). Thus, they might be expected to present a unified front on this issue. However, proposals to strengthen these provisions even further are met with suspicion in developing countries, which see patents in biotechnology and plant breeding systems as damaging for their industrial and farming interests. To the extent that Japan and the United States seek to push this agenda they would need presumably to provide greater market access, particularly in agriculture, in compensation. It remains to be seen whether such a linkage is feasible.

Second, discussions are under way at the WTO regarding extension of the special protection for geographical indications in wines and spirits to further sectors. There is scope for agreement here as a number of developing countries would like to protect their own food products with distinctive geographical indications. Japan also could benefit from specified protection for sake and varietal fruits, among other products.

**4. Interests beyond TRIPS**

The TRIPS Agreement continues to be implemented internationally and its basic structure is unlikely to be changed in the foreseeable future. However, a number of broader questions arise in the intellectual property context that countries need to consider. I provide a brief overview of three such issues here; all are far more complicated than this treatment can convey.

First, among industrialized nations Japan adopted strong intellectual property standards relatively recently. For example, pharmaceutical products have been patented only since the late 1970s and its patent rules regarding scope and opposition were reformed in 1994. Software patents are also relatively recent, though in wide use, and there are still difficulties in its recognition of well-known trademarks, at least according to USTR.

The essence of IPRs is to create market power in order to encourage innovation. In this regard, Japan has layered strong standards onto an economy that many consider to suffer from weaknesses in both static and dynamic competition. Where barriers to entry of new domestic enterprises and of incoming FDI are significant, the strengthening of IPRs could stifle competition at least as much as it promotes technical change.

Thus, there is an intimate connection between IPRs and competitive processes. While Japan has extensive guidelines in place regarding the competitive abuses of IPRs, its competition authorities may need to be vigilant in monitoring and disciplining anti-competitive arrangements arising from the nexus of intellectual property protection and private market restraints. American anti-trust officials cannot escape this connection either. The Federal Trade Commission and the Anti-Trust Division of the Justice Department increasingly are faced with complex decisions regarding the exercise of market power through patent pooling and vertical acquisition of technologies.[7]

These problems increasingly will reach across borders over time. TRIPS Article 40 recognizes the right of countries to discipline anti-competitive abuses of IPRs within their borders, subject to transparency and consultation requirements. However, in my view this provision will prove inadequate to deal with cross-border licensing restraints,

pooling agreements, and mergers associated with IPRs. Accordingly, in my view, it is time to begin multilateral and plurilateral consideration of the basic framework of an international competition agreement.

Second, important questions emerge in the interface between IPRs and environmental regulation. A considerable problem for the WTO regards how to deal with policies that could restrict trade in genetically modified organisms (GMOs), the development of which is directly tied to IPRs. Both Japan and the United States are active in producing new GMOs in agriculture and pharmaceuticals, so their industries share a common interest in limiting trade barriers. Nonetheless, TRIPS itself squarely introduces conditions of production into the disciplines of the multilateral trading system. Thus, the interplay between patent protection for GMOs and trade restraints becomes an urgent issue for multilateral consideration.

Finally, Japan and the United States share an interest in securing multilateral adherence to the WIPO Copyright Treaty and Performances and Phonograms Treaty. These treaties should help protect producers and performers whose work is disseminated electronically but also should permit nations to strike an adequate balance between information generation and fair use (Maskus, 200b). The importance to both countries of electronic commerce in promoting international exchange of information services makes recognition of rights and obligations within this medium a critical issue for the evolution of IPRs. Note further that there is a strong linkage between such protection and providing a nation's citizens access to the internet through effective telecommunications linkages. Thus, for example, the recent U.S.-Japan Agreement on Telecommunications Access Fees extends the opening of this market in Japan (USITC, 2000). Beyond these

[7] Author's conversation with Justice Department officials, August 17 2000.

agreements, Japan and the United States could consider collaboration in developing standards for international information on centralized clearing of copyrights on the internet (Rutchik, 1997).

## 5. Concluding Remarks

The United States and Japan share a broad commonality of interests in securing global protection of their intellectual property. Indeed, a collaboration of private IPRs interests in those countries and the European Union was influential in pushing the TRIPS agenda in the first place. Moreover, recent legislative reform and judicial opinions have moved the Japanese system closer to that of the United States.

Nevertheless, their regimes retain important differences, which are the basis of some bilateral contention. It is arguable that the views of the two countries regarding the strength of TRIPS implementation in developing countries are different as well. Finally, fissures could well emerge from variable regulation of competitive abuses that could surface from the international exploitation of IPRs. Thus, there is reason to think carefully about the medium-term future of global intellectual property protection and the role these countries will play in advancing it.

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**Table 1. Estimated Bilateral Net Rent Transfers from TRIPS Patent Standards ($millions in 1995 prices)**

| *Country of* | *Country of Residence of Patent Holder* | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *Patent Location* | US | JP | GE | UK | SW | CA | AU | KO | ME | BR | IN | OT | Total |
| USA (US) | -- | -690 | -212 | -521 | -132 | -1199 | -102 | -197 | -480 | -767 | -240 | -1198 | -5738 |
| Japan (JP) | 690 | -- | 115 | 20 | 21 | -56 | 15 | -92 | -15 | -70 | -86 | 10 | 552 |
| Germany (GE) | 212 | -115 | -- | -257 | -57 | -46 | -19 | -48 | -28 | -128 | -127 | -648 | -1261 |
| UK (UK) | 521 | -20 | 257 | -- | 33 | -10 | 5.7 | -17 | -10 | -44 | -48 | 30 | 698 |
| Switzerland (SW) | 132 | -21 | 57 | -33 | -- | -8.8 | -1.4 | -12 | -6.8 | -33 | -37 | -96 | -60 |
| Canada (CA) | 1199 | 56 | 46 | 10 | 8.8 | -- | 3.5 | -3.4 | -5.5 | -11 | -5.1 | 7 | 1305 |
| Australia (AU) | 102 | -15 | 19 | -5.7 | 1.4 | -3.5 | -- | -12 | -3.5 | -16 | -17 | -6 | 44 |
| Korea (KO) | 197 | 92 | 48 | 17 | 12 | 3.4 | 12 | -- | -0.1 | -0.3 | -0.5 | 48 | 429 |
| Mexico (ME) | 480 | 15 | 28 | 10 | 6.8 | 5.5 | 3.5 | 0.1 | -- | -0.01 | 0.01 | 18 | 567 |
| Brazil (BR) | 767 | 70 | 128 | 44 | 33 | 11 | 16 | 0.3 | 0.01 | -- | 0.09 | 191 | 1260 |
| India (IN) | 240 | 86 | 127 | 48 | 37 | 5.1 | 17 | 0.5 | -0.01 | -0.09 | -- | 80 | 641 |
| Others (OT) | 1198 | -10 | 648 | -30 | 96 | -7 | 6 | -48 | -18 | -191 | -80 | -- | 1564 |
| Total | 5738 | -552 | 1261 | -698 | 60 | -1305 | -44 | -429 | -567 | -1260 | -641 | -1564 | 0 |

Source: Author's updates of calculations in McCalman (2001).

**Table 2. Estimated Effects of TRIPS Patent Regulations on International Activity ($millions in 1995 prices)**

| *Country* | *GP1* | *GP2* | *Manufacturing Imports* | *(%)* | *High-Tech Mfg. Imports* | *(%)* | *Manufacturing Asset Stocks* | *(%)* | *Unaffiliated R&L Fees* | *(%)* |
|---|---|---|---|---|---|---|---|---|---|---|
| China | 2.00 | 3.25 | 16,020 | (15) | 2,693 | (12) | 657 | (19) | na | (na) |
| Korea | 3.94 | 4.30 | 2,072 | (2) | 446 | (2) | 188 | (6) | 271 | (48) |
| Thailand | 2.24 | 3.25 | 6,384 | (11) | 1,390 | (8) | 1,017 | (33) | na | (na) |
| Indonesia | 2.27 | 3.25 | 3,163 | (21) | 318 | (8) | 861 | (91) | 79 | (226) |
| India | 1.17 | 3.25 | 6,552 | (43) | 653 | (32) | 573 | (57) | 260 | (929) |

Source: Author's computations from Maskus (2000), modifying results from Maskus and Penubarti (1995), Maskus (1998), and Yang and Maskus (2000).