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Subsidies Code, Trips Agreement, and Technological Development: Some Consideration for Developing Countries

Irene Ribeiro Dubowy

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SUBSIDIES CODE, TRIPS AGREEMENT, AND
TECHNOLOGICAL DEVELOPMENT: SOME CONSIDERATIONS
FOR DEVELOPING COUNTRIES

*Irene Ribeiro Dubowy**

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|-------|---|----|
| I. | INTRODUCTION | 34 |
| II. | INFORMATION AGE AND DEVELOPING COUNTRIES | 36 |
| III. | R&D SUBSIDIES AND COMPETITION IN THE INFORMATION AGE | 37 |
| IV. | THE NEGOTIATIONS OF THE SCM AGREEMENT AND ITS IMPACT ON INFORMATION ECONOMIES | 40 |
| V. | COMPETING IN THE INFORMATION AGE: WHAT THE TRIPS AGREEMENT DOES AND DOES NOT DO | 46 |
| | A. <i>Background of the TRIPS Agreement</i> | 46 |
| | B. <i>Fostering Technology in Developing Countries: Before and After the TRIPS Agreement: What Changed Since the Draft Code of Conduct in Technology Transfer</i> | 51 |
| VI. | COMPETING IN THE INFORMATION AGE: THE U.S. EXAMPLE | 53 |
| | A. <i>An Historical Overview: Before and After the 1980s</i> ... | 55 |
| | B. <i>The Shift in the U.S. International Position: Impact of Historical Changes</i> | 59 |
| VII. | PUTTING THE BRAZILIAN BILL, LEI DE INOVAÇÃO, IN INTERNATIONAL CONTEXT | 62 |
| VIII. | CONCLUSION | 65 |

* To contact the author: Id287@nyu.edu, idubowy@hnrlaw.com, (212) 942-6689, (315) 727-6352, and (212) 689-8808.

I. INTRODUCTION

As technology continues to develop, so does the importance of intellectual property (IP) in the balance of trade. As a result of this new-found focus on IP many developed countries welcomed the discussion of procurement and protection of innovation. The Uruguay Round of Negotiations of the World Trade Organization (WTO) produced a new agreement representing a two-fold achievement: first, the agreement devised a system of enforcing international IP rights;¹ second, it addressed some concerns within the developing countries, namely, the strengthening of their technological basis.²

In this Article, I will discuss the possibilities and limits for developing countries to achieve technological development within the parameters set by both the Trade Related Aspects of Intellectual Property Agreement (TRIPS Agreement)³ and the Agreement on Subsidies and Countervailing Measures (SCM Agreement).⁴ Both agreements are integral parts of the WTO Agreement.⁵ The new standards laid out in the TRIPS Agreement and the SCM Agreement are still only in a test phase. There are innumerable questions dealing with the application of these international instruments and their limits. From a nation's sovereign right to refuse to enforce public health patents,⁶ to the balance of national interests towards

1. See generally Rochelle Dreyfuss & Andreas Lowenfeld, *Two Achievements of the Uruguay Round: Putting TRIPS and Dispute Settlement Together*, 37 VA. J. INT'L L. 275 (1997).

2. See Pedro Roffe & Taffere Tesfachew, *The Unfinished Agenda*, in INTERNATIONAL TECHNOLOGY TRANSFER, 381, 395 (Kluwer Law International ed., 2000) (noting that issues such as compulsory license and know-how were also the object of discussion in the TRIPS Agreement).

3. Agreement on Trade-Related Aspects of Intellectual Property Rights, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization [hereinafter WTO Agreement].

4. *Id.* I will discuss the SCM Agreement to the extent that relates to the overall theme of this Article, mainly, the question of whether federal sponsored research violates the SCM Agreement. WTO Agreement on Subsidies and Countervailing Measures, Apr. 16, 2002, arts. 8.2, 31 [hereinafter SCM Agreement].

5. Therefore, if a country wants to belong to the WTO it cannot make reservation to such agreement, with few exceptions. See WTO Agreement, Annex 1C, LEGAL INSTRUMENTS — RESULTS OF THE URUGUAY ROUND, vols. 31, 33, I.L.M. 81 (1994) art. 72 [hereinafter TRIPS].

6. Tina Rosenberg, *Look at Brazil: Patent Laws are Malleable. Patients are Educable. Drug Companies are Vincible. The World's AIDS Crisis is Solvable*, N.Y. TIMES MAG., Jan. 28, 2001; see also WTO Doha Declaration on the TRIPS Agreement and public health, cl. 4, WT/MIN(01)/DEC/W/2, Dec. 14, 2001, available at http://docsonline.wto.org/gen_search.asp (last visited May 1, 2003) [hereinafter WTO Doha Declaration].

We agree that the TRIPS Agreement does not and should not prevent Members from taking measures to protect public health. Accordingly, while reiterating our commitment to the TRIPS Agreement, we affirm that the Agreement can and

IP protection and the promotion of technology,⁷ there are still many gaps to be filled in order to shape the international system of IP.⁸

In this Article, I will argue that developing countries, eager to develop their own technological base, should consider the decentralized U.S. model of Research and Development (R&D). This generally successful model looks at commercializing inventions made by institutions directly or indirectly connected to the government. Its adoption, however, should be pursued with caution, since the U.S. system of innovative procurement may be actionable under the WTO via SCM Agreement provisions, which deal with subsidized R&D.⁹

In order to draw the necessary commitment from developing and developed countries, policymakers should interpret the TRIPS Agreement and the SCM Agreement with the goal of balancing private property rights with the power of a nation to implement its core economic and health policies.¹⁰ With the liberalizing of national borders towards foreign goods and services, policymakers around the world struggle to devise a system which can strengthen the technological basis of a nation, thereby serving as a legitimate way to compete internationally. Upon analyzing the U.S.

should be interpreted and implemented in a manner supportive of WTO Members' right to protect public health and, in particular, to promote access to medicines for all.

Id.

7. TRIPS art. 7:

Objectives: The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

8. *See, e.g.*, Berne Convention for the Protection of Literary and Artistic Works, Sept. 9, 1896, revised at Berlin, Nov. 13, 1908, at Rome, June 2, 1928, at Brussels, June 26, 1948, at Stockholm, July 14, 1967, at Paris, July 24, 1971, and amended on Sept. 28, 1979 [hereinafter Berne Convention]; *see also* International Convention for the Protection of Industrial Property of Mar. 20, 1883, as revised at Brussels on Dec. 14, 1900, at Washington on June 2, 1911, at the Hague on Nov. 6, 1925, at London on June 2, 1934, at Lisbon on Oct. 31, 1958, and at Stockholm on July 14, 1967. Both treaties are still very important, being incorporated by references into the TRIPS Agreement; however, the TRIPS Agreement in a single body of law with wide membership, introduced greater harmonization, and mostly important, mechanisms of enforcement for the rights granted than either of these previous treaties.

9. SCM Agreement arts. 8.2, 31.

10. *See, e.g.*, TRIPS arts. 7, 8.1, 8.2, 27, 41.

experience, I will argue that a similar system should be implemented in Brazil,¹¹ where similar legislation is being considered, thus avoiding the pitfalls of illegal subsidies.

II. INFORMATION AGE AND DEVELOPING COUNTRIES

In the post-industrial information age, intangible goods such as trade secrets, patents, copyrights, and trademarks have become one's most valuable property.¹² This type of intangible property is protected by an IP system, which continuously evolves to reflect increasing economical importance.¹³ Robert Verzola illustrates the economic relevance of information driven products and the disparity between information intensive products and information-extensive products. Verzola¹⁴ offers the example of the price

of a CDROM which might sell for \$300, but whose production cost is around \$3, and a typical Philippine product like sugar, which might sell for 15¢ per pound. Much of the \$300 in the price of 2,000 pounds of sugar would barely cover the cost of production, while much of the \$300 in the price of a CDROM would be profit. Royalties from intellectual property rights [and] other income from information renters assume major [significance].

Although comparing sugar to CD-ROMs is not absolutely fair since the value extracted from royalties reflects also the high initial investment in

11. See Ante-Projeto de Lei de Inovacao Cientifica, P.S.L. 257/2001, at Diário do Senado Federal Brasileiro (Dec. 1, 2000), No. 23631-34, available at <http://www.senado.gov.br/web/cegraf/pdf/30112000/23631.pdf> (last visited Mar. 17, 2003). This bill, in discussion in the Brazilian Congress, devises a system of subsidies to technological innovation, borrowing concepts advanced by the Bayh-Dole Act and Stevenson-Wydler Act.

12. See Thomas McCarthy, *Intellectual Property — America's Overlooked Export*, 20 U. DAYTON L. REV. 809, 811 (1995). McCarthy argues that the IP export has become one of the few bright spots in the otherwise dreary U.S. balance-of-trade picture. Among the justifications of a strong international IP protection, he argues that because "we cannot compete in a world market for producing steel or clothes or VCRs when manufacturers in developing nations can pay what we would regard as a less than living wage." *Id.* at 814.

13. E.g., GRAEME DINWOODIE ET AL., *INTERNATIONAL INTELLECTUAL PROPERTY LAW AND POLICY 708-09* (2001) (discussing the European Directive on the Legal Protection of Databases, that, undoubtedly, extended the scope of IP rights).

14. Roberto Verzola, *Cyberlords and the Philippine Greens*, in *SYNTHESIS/REGENERATION* (1998).

R&D, nonetheless the information intensive products obtain the higher rate of return when compared to commodities, such as sugar.

It has long been a strategy of developing countries to devise a way out of underdevelopment by absorbing technology from the North. This strategy was embodied in the negotiations of a Draft Code of Conduct of International Technology Transfer,¹⁵ which will be the subject of some discussion in this Article. Ten years of negotiations did not result in a final agreement. Nevertheless, the Draft Code remains a valuable reference source towards achieving technological development in developing countries. This in turn presents concerns of the Group of 77,¹⁶ partially acknowledged in the Uruguay Round of Negotiations.

III. R&D SUBSIDIES AND COMPETITION IN THE INFORMATION AGE

The TRIPS Agreement brought both developed and developing countries together and established a basic framework of free competition by balancing legal incentives to create against public interest in free competition.¹⁷ In the developed countries, there is a growing appetite favoring a high-protectionist bias for creators and investors, with a concomitant stifling of pro-consumer and pro-competitive voices.¹⁸ New sui generis rights such as protection for patent databases, computer programs, and plant varieties are flourishing in developed countries.¹⁹ According to Reichman, part of the reason for this tendency is:

15. PROPOSED DRAFTS OF INTERNATIONAL TECHNOLOGY TRANSFER, *reprinted in* INTERNATIONAL TECHNOLOGY TRANSFER: THE ORIGINS AND AFTERMATH OF THE UNITED NATIONS NEGOTIATIONS ON A DRAFT CODE OF CONDUCT, ANNEX II (Kluwer Law International ed., 2000).

16. Carlos B. Aguirre, *The Latin American Policies*, in INTERNATIONAL TECHNOLOGY TRANSFER, *supra* note 15.

17. J.H. Reichman, *Global Competition and the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)*, in INTERNATIONAL TECHNOLOGY TRANSFER, *supra* note 15, at 351.

18. *See id.* at 353; *see also* Keith Aoki, *Neocolonialism, Anticommons Property, and Biopiracy in the (Not-So-Brave) New World Order of International Intellectual Property Protection*, 6 IND. J. GLOBAL LEGAL STUD. 11 (1998) (arguing that the tragedy of anticommons (to many people with the right to exclude) can lead to an underutilization of IP. Arguing that the intellectual public trust doctrine is being annihilated by theories such as doctrine of equivalents, or broader scope of patentable subject matter).

19. *See also* European Trademark Directive, Dec. 21, 1988, (89/104/EEC) art. 7; Zino Davidoff v. A&G, 2002 E.T.M.R. (E.C.J. 2001) (denying the doctrine of international exhaustion between the European Union and the rest of the world).

[a defensive] mentality that tends to view national innovation policy in terms of preserving the dominant position of existing technology exporting firms. [By] combining the market power of natural competitors with strengthened international intellectual property protection, oligopolists in developed countries seek to make it harder for firms in developing countries to gain access to the most valuable technologies or to catch up with the leaders in the global market for higher-tech products.²⁰

Although the TRIPS Agreement tries to cutback free riders, in practice different national innovation strategies will lead to varied interpretations of the TRIPS Agreement. This could, in turn, produce a spectrum of choices in answering the problem of free riding. In this tone, free riding by some countries may be an efficient choice since the net result will be the increase in world wealth. Although application of the TRIPS Agreement diminishes the possibilities of free riding drastically by adopting minimum standards, it is nonetheless possible to interpret the TRIPS Agreement as allowing developing countries to "catchup" to the developed world's state of art. Japan and the United States have had very relaxed IP policies in the past, which helped foster the development of technology while investments were scarce, further allowing these countries to level the playing field with their European counterparts.

Although not every relaxed system will lead to technological innovation, it is also unlikely that a strict system, absent other incentives, will lead to technological innovation either. Brazil's worst trade deficit is in the area of microelectronics. In 2002, the deficit was around \$7.6 billion. Only in semiconductors, have Brazil's imports been worth a surplus of \$820 million. By contrast, South Korea's²¹ technological adaptation, acted as a jump-starter for progress in areas of basic research and technological innovation.

In South Korea's first stage of adaptation, the program of technological innovation was geared towards adapting technologies and fostering an ample and vigorous educational effort. Recently, South Korea has also become geared to basic research, after becoming conscious that without

20. Reichman, *supra* note 17, at 355.

21. See Nicolas Gikkas, *International Licensing of Intellectual Property: The Promise and Peril*, 1 J. TECH. L. & POL'Y 6 (1996) (arguing that free riding is sponsored theft by state, offering the example of Korea which, among other nations, used free riding to constitute its high tech industrial base).

advancements in research, there is nothing to afford a competitive edge.²² While some scholars have argued that free riding does not solve the long-term problems of underdevelopment, free riding may be positive in terms of leveling the playing field if a country has a focused technological innovation program.

Developing countries suffer from inadequate technical capacity and a lack of capital investments. At the same time, developing countries are left to devise a system of innovation which can improve their competitive profile. This is accomplished by acquiring and absorbing technical and scientific knowledge while attempting to comply with the TRIPS Agreement. Reichman suggests that developing countries should maneuver in areas that allow for broad interpretation, the so-called gray areas²³ of the TRIPS Agreement. For example, Brazil should go around the limits of TRIPS and take advantage of the entire European Patent Database, which it has had full access to since 2002,²⁴ and promote a stricter prior art review. Reichman argues that developing countries should take the role of fostering competition and asserting the right to compete on fair and equal terms in a global market.²⁵

The TRIPS Agreement, however, is not the only obstacle of developing countries in the information age. The SCM Agreement also operates as a barrier for governments interested in subsidizing R&D. Although the initial provisions of the SCM Agreement provided a large leeway in terms of governmental R&D, those provisions expired in 1999, and the current state of law may jeopardize the efforts of developing and developed countries as they try to foster technological innovation.

22. Ronaldo Mota Sardemberg, *Conhecimento: a vertente essencial* (Revista Exame Mar. 17, 2003), available at http://www.mct.gov.br/comunicacao/textos/default.asp?cod_tipo=2&cod_texto=1882 (last visited Mar. 17, 2003) [Portuguese].

23. J.H. Reichman, *From Free Riders to Fair Followers: Global Competition under the TRIPS Agreement*, 29 N.Y.U. INT'L L. & POL. 11 (arguing that higher standards of non-obviousness, or prior art could be enforced still within TRIPS compliance).

24. Valor Econômico, Feb. 26, 2002, *INPI Firma Acordo para Implementar Base Tecnológica*, available at http://www.mct.gov.br/sobre/namidia/CTnamidia/2002/26_02c.htm (last visited Mar. 17, 2003) (article in a Brazilian Newspaper, announcing a partnership between the European Patent Office and the Brazilian Patent Office in which the European Patent Office made available the entire patent database (over 90 million documents) in its digitized form. The Brazilian Patent Office has in turn made available the Brazilian digitized database since 1982.).

25. J.H. Reichman, *supra* note 17, at 362 (stating the "real question is not whether these countries can compete, even in markets for technological and information goods, but whether the developed countries still have the stomach for stiff global competition once it becomes a legal and economic reality").

IV. THE NEGOTIATIONS OF THE SCM AGREEMENT AND ITS IMPACT ON INFORMATION ECONOMIES

As the prices of commodities go down, and the prices of information intensive products go up, countries shift their focus on more technology intensive products. EMBRAER, a Brazilian aviation company is now one of Brazil's leading exports, with sales around \$2.6 billion yearly. In a fierce information intensive markets, governments are major players. The battle between Canada (Bombardier) vs. Brazil (EMBRAER) over the market for small to middle sized aircrafts has presented the WTO Panels with the difficult task of carving certain guidelines for government participation in international markets. Brazil was condemned to pay over \$1.4 billion in trade sanctions over 6 years for having subsidized interest rates, which were incurred by buyers of Brazilian aircrafts.²⁶ Brazil retaliated and argued that Technology Partnerships Canada (TCP), a program designed to foster technological development in the Canadian industry, was also an export subsidy. The WTO Panel found that the Canadian program violated Article 3.1 (a) of the SCM Agreement based on the propensity of the Canadian aircraft industry to export and because grants towards TCP were given relatively near commercial exploitation. Canada argued that the decision to consider a propensity to export as a proxy to find an export subsidy destroyed the framework of amber light domestic subsidies and certain green light subsidies (allowed in August 1999) by converting them into red light subsidies.²⁷ The dispute between Brazil and Canada is an example of the disputes that may arise as countries embark upon a path to economic prosperity that is dependent on information driven export industries and WTO Panel decisions, which may have drastic consequences in R&D policymaking.

In this section, I will discuss the relationship that emerges between the TRIPS Agreement and the SCM Agreement, both integral parts of the

26. WTO Report of Appellate Body, Brazil Export Financing For Aircraft, Aug. 2, 1999 (WT/DS46/AB/R). Brazil argued that the interest rates subsidization did not materially advantage Embraer, but only off-set the "risk Brazil" of sovereign default, reflected by extremely high interest rates. The Appellate Body of WTO held although it was ready to find that the material advantage could not be treated as simply "leveling the playing field," in the present case Brazil had not met its burden of proof of denying the effect of the interest rates as a material subsidization. *Id.* at ¶¶ 15, 181-84.

27. See *infra* notes 38-40; Department of Foreign Affairs and International Trade, Canada/Brazil WTO Panels — Aircraft, available at http://www.dfait-maeci.gc.ca/tna-nac/air_appeal-e.asp (last visited Mar. 17, 2003).

WTO framework.²⁸ The negotiations at Uruguay resulted in linking the General Agreement on Tariffs and Trade (GATT) enforcement procedures (e.g., denial of most favored nation treatment, countervailing duties) requiring country-members to harmonize their system of IP protection. In doing so, they created a connection of different agreements to modify the general enforcement procedures, thereby creating a legal interdependence of SCM and TRIPS. We will focus on the interdependence between the TRIPS Agreement and the SCM Agreement.

We now turn to the analysis of the role of federally funded R&D programs in the U.S. economy,²⁹ and its interplay with the SCM Agreement. The TRIPS Agreement interacts with the SCM Agreement and vice versa in various ways. If a patent is issued in a country where all the costs are subsidized by the government, the rights will balance in favor of the patented product to remain in the public domain since the reward justification for the patent will be lost. We are also aware, however that subsidizing R&D has been proven an efficient way of achieving economic prosperity, therefore triggering considerations in Article 7 of the TRIPS Agreement, which deals with IP and technological innovation.

The United States, since the 1980s, adopted a very determined policy of fostering technological innovation. This is partly based on the notion that the United States could not solve the insistent balance of payment deficits without the help of its brighter trade figure: the IP export.³⁰ In 1999, the U.S. expenditures in R&D were on the order of \$247 billion. The government was responsible for \$65.8 billion, or 26.6%.³¹ Since 1994, the government decreased its funding for industrial research, although remaining quite expressive.³² Although unclear, one reason the United States decreased its funding could be the apprehension that such funds may be classified as an unlawful subsidy in the future. Notwithstanding

28. Accordingly, it is not possible to be a WTO country and have most favored nation treatment if the country did not sign both agreements.

29. The United States is the object of this Article, which does not mean that other developed countries like Germany and Japan do not carry similar programs. According to the 2002 World Development Indicators of the World Bank, 22 leading industrialized countries are spending 2.5-3% of their GNP on R&D. 2002 World Development Indicators of the World Bank, available at <http://www.undp.org/> (last visited May 1, 2003) (on file with author).

30. See McCarthy, *supra* note 12.

31. National Science Foundation, National Expenditures for R&D: Performance by Sector, Subdivided by Sources of Funds: 1992-1999, available at <http://www.nsf.gov/sbc/srs/nsf00306/tables/tb1a.xls> (last visited Apr. 26, 2002).

32. See National Science Foundation, Trends in Industrial R&D Performance, by Source of Funds, in Current and in Constant Dollars: 1953-98, available at <http://caspar.nsf.gov/nsf/srs/IndRD/NSF%2001%2D305/A-1.xls> (last visited Mar. 17, 2003).

government sponsored R&D remains very important in the United States. For example, in 1994 the United States spent \$85 billion in R&D. During the same period, Japan, a country that had spent second most in R&D, had invested merely \$10 billion.³³

The massive investment that the U.S. government provided for R&D reflects its economic policy to prioritize investments in areas with the potential to diminish trade deficits. In 1994, during the Uruguay Round negotiations of the Dunkel Text, the United States voiced its concerns that the government would be impeded from carrying previously approved programs, if the text passed in its proposed form. Before analyzing the problem associated with the Dunkel text, it may be worth it to step back and review the general framework of the SCM Agreement.

[The] WTO Agreement on Subsidies and Countervailing Measures (SCM agreement)³⁴ deals with government subsidization. Subsidization occurs when the government gives the producer an advantage in the market place. This support may, in turn, negatively affect other countries' industries and trade. The objective of the Agreement is to curb the use of such government assistance.³⁵

The SCM Agreement applies to industrial products and agricultural products, to some extent. The SCM Agreement defines which types of subsidies distort trade.³⁶ According to the SCM Agreement, the most distorting subsidies are those intending to promote exports or displace imports, or those given to specific industries. If a country illegally subsidizes an industry, the affected country can take trade measures (countervailing duties) unilaterally to offset the injury, or it can resort to the WTO Dispute Settlement Body to seek the discontinuation of the subsidy program.

33. *The GATT Subsidies Code and Its Impact on Research and Development in the U.S.: Hearing on H.R. Before the Committee on Science, Space & Technology*, 101st Cong. (1994) (testimony of Richard K. Quisenberry, Ph.D. (Apr. 21, 1994)); see also MICHAEL P. RYAN, KNOWLEDGE DIPLOMACY 2 (1998). Ryan points out that in 1992 around 45% of all industrial R&D in the industrialized countries was carried out in the United States, and that U.S.-based inventors earned about 45% of patents granted by the U.S.P.T.O. and 25% of the European Patent Office. *Id.* at 2.

34. WTO Agreement on Subsidies and Countervailing Measures, Apr. 15, 1994, available at http://www.wto.org/english/docs_e/legal_e/24-scm.pdf (last visited Apr. 4, 2003) [hereinafter SCM Agreement].

35. Department of Finance of Canada, *Subsidies and Countervailing Measures Information Paper*, available at http://www.fin.gc.ca/activty/pubs/Sub_e.html (last visited Apr. 4, 2003).

36. SCM Agreement, *supra* note 35, art. 1.

The SCM Agreement defines three types of subsidies: red light subsidies, amber light subsidies, and green light subsidies. Red light subsidies³⁷ are prohibited subsidies. These are considered the most trade distorting, and are established on the contingencies of export performance, or the use of domestic goods. Amber light subsidies,³⁸ while not prohibited, may be actionable under the SCM Agreement. These are specific subsidies, given to a particular industry, which provoke either injury to a domestic industry of another member, the nullification of benefits accruing to other members, or serious prejudice to the interests of another member. Finally, green light subsidies³⁹ are nonspecific and fall under the category of nonactionable subsidies. Among the green lighted subsidies are subsidies in R&D. Green light subsidies are considered the least trade distorting subsidies and are not subject to trade action. It is not clear why R&D subsidies are considered as such. It is conceivable, however, that a patent acquired via a federal subsidy and subsequently registered in a foreign country would have the distorting effect of preventing the competition of other companies from the manufacture or importation of the product, therefore injuring the domestic industry since the latter would be impeded from the manufacture of the patented procedure. Some authors argue,

37. *Id.* art. 3.

38. *Id.* art. 5.

39. *Id.* art. 8 (excerpt):

Identification of Non-Actionable Subsidies

8.1 The following subsidies shall be considered as non-actionable:

[8.2] Notwithstanding the provisions of Parts III and V, the following subsidies shall be non-actionable:

(a) assistance for research activities conducted by firms or by higher education or research

Establishments on a contract basis with firms if: the assistance covers not more than 75 per cent of the costs of industrial research or 50 per cent of the costs of pre-competitive development activity;

and provided that such assistance is limited exclusively to: (i) costs of personnel (researchers, technicians and other supporting staff employed exclusively in the research activity); (ii) costs of instruments, equipment, land and buildings used exclusively and permanently (except when disposed of on a commercial basis) for the research activity;

(iii) costs of consultancy and equivalent services used exclusively for the research activity, including bought-in research, technical knowledge, patents, etc.;

(iv) additional overhead costs incurred directly as a result of the research activity;

(v) Other running costs (such as those of materials, supplies and the like), incurred directly as a result of the research activity.

however, that such subsidies are indirect and have only faint effects in the market.⁴⁰ Article 8.2 indicates that up to 75% of government funding on basic R&D shall be nonactionable. For applied or industrial R&D, the cap is fifty percent. This provision was seen as a victory for industries, which relied heavily on governmental funding for R&D. As the Congressional Record points out, the original proposal expressed in the Dunkel text limited the basic research cap to fifty percent and the applied research cap to twenty-five percent. This in turn, would have excluded many of the R&D programs in the United States for being "green lighted."⁴¹ During the Uruguay Round of Negotiations, the Dunkel text was changed. The cap for basic research was raised to seventy-five percent, while the cap for applied research (pre-competitive research) was raised to fifty percent. This was considered a victory for many sectors of the U.S. industry that saw the original text as a threat to the programs.

The SCM Agreement in Article 31 states that some of the provisions of the agreement would be temporary. Among these provisions is Article 8.2, which deals with subsidies in R&D that were formerly considered nonactionable. The provision expired at the end of 1999 because the

40. ALAN GUTTERMAN, *INNOVATION AND COMPETITION POLICY* 389 (Kluwer Law International ed., 1997).

The analysis of restrictions on competition in the context of research and development joint ventures is similar to that which must occur when the joint venture relates to downstream activities, such as production and sales; however, since research and development is generally materially removed from the market place for the products of the development work, it may be assumed that the potential for an appreciable effect in competition will be much less than in other types of joint ventures which *involve* activities closer to the market.

Id.

41. *The GATT Subsidies Code and its Impact on Research and Development in the U.S.*, Hearing before the Subcommittee on Technology, Environment and Aviation, 103d Cong. (Apr. 21, 1994) (statement of John Gibbons, Dir. of the Office of Sci. & Tech. Policy).

[The] Dunkel text would not have had a similar effect on other countries because they rely less heavily on central government R&D support and on other technology policies in support of industry . . . [Before] it was modified, the Dunkel Text made U.S. programs uniquely exposed to the uncertainties of countervailing duty actions by our trading partners. This situation led to an urgent call to renegotiate the R&D language of the subsidies agreement to provide greater protection for our investments in American industry that have long had bipartisan support. . . .

Id.

members could not reach an agreement as to its extension. Since its expiration, subsidies on R&D have become actionable and can be subject to countervailing duties, or a ruling by a Dispute Settlement Panel to discontinue such programs. The Canadian government appeared concerned with the expiration of Article 31, considering the relevance of R&D subsidies to the new economy, and therefore seemed to support the continuance of a similar rule excluding R&D from actionability:

In knowledge-based industries, government assistance is often provided differently than in the old economy. For example, there is more focus on government-private sector partnerships in R&D, and assistance comes in forms that are difficult to quantify, such as transfers of intellectual property. This is true in Canada as well as elsewhere. Given this shift, it would be useful to examine whether new rules are necessary or desirable to address such assistance.⁴²

Since the lapse of Article 31 in 1999, governmental sponsored R&D may be subject to countervailing duties and dispute settlement. This appears plausible as subsidized R&D can have an adverse impact in a particular country. This was also one of the points of contention between Canada and Brazil in the WTO. Canada, through its federally sponsored R&D program, the TCP program, provided grants to enterprises in Canada geared towards exportation, thereby affecting the ability of EMBRAER to compete internationally. The WTO Dispute Settlement Panel ruled, and the Appellant Body confirmed, the TCP program was a prohibited subsidy.⁴³ However strong the impact of such subsidies in other countries, subsidized R&D has proven to be an effective tool in achieving economic prosperity balancing interest of the patent holder in enforcing its patent and the nation that receives this technology, R&D subsidies reduce the reward justification. The Doha Declaration⁴⁴ issued in November 14, 2001 by the Ministerial Conference is the topmost body of the WTO. On November 14, 2001, this body issued the Doha Declaration and in turn adopted a position defended by many developing countries. The body adopted an interest balancing approach by declaring that nothing in the TRIPS Agreement denied a country the right to protect the health of its citizens.

42. Department of Finance of Canada, *supra* note 36.

43. See *infra* Part IV; see also World Trade Organization, Canada Measures Affecting the Export of Civilian Aircraft, AB-1999-2 (WT/DS70/AB/R), available at http://docsonline.wto.org/gen_search.asp (last visited Apr. 16, 2003).

44. WTO Doha Declaration, *supra* note 6, cl. 4 (After Doha, it is clear that countries can issue compulsory licenses to address public health crisis such as the AIDS epidemics.).

V. COMPETING IN THE INFORMATION AGE: WHAT THE TRIPS AGREEMENT DOES AND DOES NOT DO

While the Code of Conduct on International Technology Transfer failed to be implemented, developing countries during TRIPS negotiations successfully voiced their interest in not being limited by the TRIPS Agreement. They wished to do what other countries had done previously in order to foster a strong technological base by carving their responsibilities in the TRIPS Agreement while having their own developmental needs as a background.

A. Background of the TRIPS Agreement

Before the TRIPS Agreement, a country could not challenge the substantive patent law of another country under GATT.⁴⁵ Therefore, if a country felt that it was being unduly burdened in trade with a foreign country, it would have had to resort to some unilateral measure like Section 301,⁴⁶ promoting retaliation measures, rather than international cooperation. In fact, IP was a general exception to the principle of free trade. In the GATT panel of United States — the panel members concluded that patent protection was an area in which a member country could take

45. Daniel Gervais, *The TRIPS Agreement: Draft Analysis and History*, SWEET & MAXWELL 6-9 (1998).

In 1989 report in the case United States — section 337 of the Tariff Act of 1930, the panel made it clear that, in the light of Article XX(d), the substantive patent law of a contracting party could probably not be challenged under GATT. However, contracting parties had the obligation to enforce their patent legislation in a manner that was not inconsistent with GATT provisions. As a result, the provisions allowing suspension of importation of goods allegedly infringing a U.S. patent were said to violate GATT because, among other reasons, did not afford procedural rights of defense under the International Trade Commission, body which granted the questionable relief.

Id. at 7.

46. Sections 301-310 of Trade Act of 1974 devised a scheme that if the U.S. Trade Representative finds that the United States was being denied its legitimate rights under a trade agreement by a foreign country, or if it finds that the legislation or practices of a foreign country unduly burdens U.S. commerce, the Trade Representative may suspend or withdraw from the application of trade agreements, or impose duties or other restrictions on the imports of the country which had perpetrated the alleged injury to the extent of the injury to the U.S. commerce. Trade Act of 1974 § 301.

measures otherwise not in conformity with their GATT obligations.⁴⁷ It was only in the Tokyo Round (1973-1979) that the problem of counterfeited goods was considered an issue of international trade to be addressed by GATT.

The TRIPS Agreement, by establishing minimum standards of protection, was to solve some of these problems and harmonize IP across the globe. It was first established that the TRIPS Agreement would approach IP trade to the extent that it affected trade in goods and services while only clarifying the existing GATT provisions. The negotiations of the Uruguay Round began in 1986, and by 1987 the negotiations were polarized to supporters of a far-reaching agreement of IP. At the other side, developing countries were concerned about overprotection of IP rights⁴⁸ and the far-reaching nature of the Agreement. Accordingly, developing countries tried to argue that the TRIPS Agreement should apply when a distortion in trade could be proven. Eventually the position defending a far-reaching agreement prevailed.

Developing countries, however, put forward their own agenda. The Group of Developing Countries (Group of Fourteen) used the TRIPS Agreement to advance concerns over the need of a compulsory license system in certain cases. In addition, they were concerned over the need⁴⁹ to have a technological base of their own, which according to the Group of Fourteen, should not be prevented, but rather fostered in the TRIPS Agreement. Throughout the TRIPS Agreement,⁵⁰ provisions express the concerns of developing countries that IP rights are not to become a burden on the development of a country's technological base. The concern by developing countries is that the TRIPS Agreement becomes a burden to their development as expressed during the discussion of Article 7.⁵¹ In this discussion, the issue was raised of whether the working requirement of a patent was a cornerstone of the patent system. More particularly, the issue was whether working the patented invention in the country of grant was one of the obligations of the patentee. The spokesperson for the Group of Fourteen argued that:

47. Gervais, *supra* note 46, at 6 (citing case L/5333, May 26, 1983).

48. *Id.* at 7 (citing the Brazilian position, MTN.GNG/NG11/W/30 (Oct. 31, 1988)).

49. TRIPS pmbl., paras. 5, 6.

50. Gervais, *supra* note 46, at 37 (notes that preambles are an essential part of GATT law. "Preambles are on occasion relied upon to a considerable extent by panels when the wording of a provision is not clear or where it is susceptible to divergent interpretations.").

51. TRIPS art. 7; *see also supra* text accompanying note 7 (stating "balance of national interests towards IP protection and the promotion of technology").

such working was an essential element upon which the patent system was based, and was part of the balance between the interests of patent owners and those of the country undertaking to protect inventions . . . [One] of such abuses was explicitly stated by the Paris Convention to be failure to work.

In the end, the working requirement could not be agreed upon. Although in the case of patents, it is arguable whether a working requirement indeed fosters technological innovation within the granting country. It is true that patents, in order to be valid, must be capable of being reproduced by a person with skill in the art. Therefore, if the patent is too vague, or if it does not carry the right specifications, the patent is void. Nonetheless, a great deal of information, crucial to the technological innovation, is not presented in the patent. This is where simple know-how starts.⁵² One path that could be undertaken by developing countries would be the creation of a much stricter, enabling requirement, based on the theory that people of ordinary skill need more guidance. This threat might create some willingness to permit working requirements, greater subsidization of research, or more technical assistance. The Group of Fourteen tried to prevent this problem by construing the Agreement so not to forbid a working requirement. After all, the justifications of such a requirement would be endorsed by the language of Article 7. The Developed Countries Groups, nonetheless, interprets Article 7 so that it does not conflict with other provisions of the TRIPS Agreement. They argue that Article 27,⁵³

52. See *FN Mfg., Inc. v. United States*, 44 Fed. cl. 449 (1999) (where FN Manufacturing argued that U.S. settlement of claim against Colt, in which the government argued that Colt did not provide enough specifications in its patent of M16 machine guns, was capricious. The underlying claim was that M16 specifications, even if followed by the most rigorous person with skill in the art could not have provided the dimensions of which certain replacement parts should be. The only way the information should be acquired was by looking into the manufacturing process of Colt. This made the replacement parts done after the patent expired incompatible with the M16 frame. This suit reflected the thin lines between what is know-how, and what is necessary disclosure to a patent.).

53. TRIPS art. 27.

Patentable Subject Matter: 1. Subject to the provisions of paragraphs 2 and 3, patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. Subject to paragraph 4 of Article 65, paragraph 8 of Article 70 and paragraph 3 of this Article, patents shall be available and patent rights enjoyable *without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced*. . . .

dealing with patentable subject matter, states that patents shall be granted without discrimination of whether the patented products are locally produced or imported. According to those countries, Article 27 is a prohibition of the working requirement found in certain legislations. In turn, the United States raised a complaint against Brazil before the WTO.⁵⁴ According to the United States, Brazilian Patent Law's Article 68⁵⁵ had a working requirement that was inconsistent with the obligations under Articles 27.1 and 28 of the TRIPS Agreement. According to Brazil,⁵⁶ the same local working requirement was present under 35 U.S.C. section 204. This statute required that certain firms, with title to U.S. government funded inventions, manufacture substantially within the United States, unless the requirement is waived.⁵⁷ The two countries eventually settled and Brazil committed that before resorting to a compulsory license of a U.S. patent, it would provide for hearings and consult with the United States.

Considering Brazil's questionable interpretation of Article 27 of the TRIPS Agreement, it is not clear why the United States settled. It is

Id. (emphasis added).

54. See WTO Complaint by the United States Concerning Brazilian Patent Law, WT/DS199/3 (Jan. 9, 2001), available at <http://www.wto.org> (last visited Feb. 13, 2003).

55. Free translation of the relevant provision of Article 68 of Law No. 9279 of 1996 reads as follows:

Art. 68 – the patent holder may have its patent compulsorily licensed in case of abuse in the exercise of rights granted by the patent, or in case of abuse of economic power achieved through the patent right, to be proved under a court of law or administrative decision. Section 1: Compulsory license shall be granted equally: I) in case of non exploration of the object of the patent in the Brazilian territory for lack of manufacturing or incomplete manufacturing, excepted the cases of economic infeasibility, where importation will be allowed . . .

Supporters of the Brazilian law argue that what is forbidden under the TRIPS Agreement is an absolute working requirement. According to them, the working requirement is not absolute because the patent holder can prove that it is not economically feasible to install a factory in the country, the patent holder can have the patented products imported. Brazilian Intellectual Property Law, No. 9279/96, available at <http://www.senado.gov.br/legbras/>, in numero box input 9279 and in Tipo de Norma select lei ordinaria (last visited Apr. 16, 2003) (on file with author).

56. WTO Dispute, Complaint by Brazil Against the United States concerning 35 U.S.C. § 204, WT/DS224/1, Feb. 7, 2001, available at http://docsonline.wto.org/gen_search.asp, in document symbol input WT/DS224/1 (last visited Apr. 16, 2003) (on file with author). Although Brazil did not argue its unlawfulness, the "first to invent" rule applied in IP law of the United States and may also cause some problematic results as to the recognition of patentable subject matter because foreign prior art is not recognized as such. The rule is supported under the argument that the United States has an interest that foreigners register their patents in the United States. See also *Application of Hans Hilmer*, 359 F. 2d 859 (CCPA 1966).

57. 35 U.S.C. § 204.

possible that the United States did not wish to have its own legislation concerning working requirements scrutinized since they are indeed present in most of the innovation procurement legislation. One could also argue that, at that time, there was an international outcry against abusive practices of pharmaceutical countries in Africa, which denied the HIV cocktail to millions of HIV patients in Africa. It would be controversial and maybe politically unwise to bring a Dispute Panel against Brazil, a country having substantial positive results in its AIDS program. The Brazilian approach was innovative and offered evidence contrary to those used by pharmaceutical countries to deny AIDS drugs in Africa. The pharmaceutical companies alleged that offering the retrovirus to Africa would put the world population in danger. They argued that the African population would likely not comply with prescription requirements while harder and more dangerous strains of the virus would develop. In Brazil, a program was administered by the Minister of Health to populations of all incomes while compliance with the program was substantial.⁵⁸

As this case may suggest, the interpretation of TRIPS Agreement provisions are still far from definitive. It is important to balance, within the TRIPS framework, the interests of IP rights holders with other considerations. These considerations include public health, the importance of a strong technological basis for economic prosperity and considerations outside the TRIPS Agreement. In the case of research subsidies, such outside considerations include whether patented medicine provokes an injury to a particular industry. As the dispute between the United States and Brazil illustrated, there are no clear-cut cases. It is, therefore, essential to consider the validity of an innovation procurement program with a general understanding of the underlying goals countries try to achieve. This is valid when the United States analyzes the legality of a Brazilian working requirement, as well, as if a given country decides to bring an action against a national program's subsidizing R&D.

58. Rosenberg, *supra* note 6.

Brazil was successfully using medicines based on U.S. patents to treat for free Brazilian patients infected with HIV. They took their medicine properly 80 percent of the time. According to Margaret Chesney, a professor of medicine at the University of California at San Francisco . . . this rate is not sufficient to control the virus — which can kill even people who take their medicine faithfully — *but it is no different from adherence rates in the United States. A study in San Diego showed that 72 percent of patients took their medicines 80 percent of the time.*

Id. (emphasis added).

B. Fostering Technology in Developing Countries: Before and After the TRIPS Agreement: What Changed Since the Draft Code of Conduct in Technology Transfer

During the 1970s, developing countries negotiated the implementation of a code of conduct in technology transfer situations.⁵⁹ These countries, under the perception that they were invariably denied the full benefits of technological innovation by multinational companies, sketched a system in which the transferor of technology had obligations towards the countries. Such obligations included the prohibition of grant backs and the transfer of simple know-how after the expiration of underlying patents. Industrialization in the 1960s and 1970s was perceived in developing countries as a process of absorbing foreign technology.⁶⁰ This concern encouraged the screening of foreign technology, allowing it only when it was compatible with the developmental needs of the country. Countries could impose restrictions upon repatriation of funds, by regulating anti-competitive measures present in the license agreements of foreign companies with the government or with domestic industry. The Draft Code of Conduct was not an isolated act. It was part of the movement in the United Nations with which developing countries attempted to promote more balance in the relations between countries and multinationals. That was seen as the "New International Economic Order." Developed countries received the international economic order proposal with skepticism, and did not adhere to these agreements.⁶¹ Therefore, technology transfer negotiations towards the overall development of a country died out until the TRIPS Agreement.

In the TRIPS Agreement, developing countries again voiced their concerns that they could not put the protection of IP rights before their own national interests for the sake of a strong national technological basis. Developing countries, for the most part, do not see technology transfer only in terms of absorption of technology.⁶² However, there is still a perception that more cooperation is needed than what is actually offered. The Group

59. DRAFT OF INTERNATIONAL CODE OF CONDUCT ON THE TRANSFER OF TECHNOLOGY, reprinted in INTERNATIONAL TECHNOLOGY TRANSFER, *supra* note 15.

60. For example, transfer of new skills to local employees of enterprise; stimulus to local R&D; diffusion of new technologies throughout the local economy.

61. Except the revision of the Paris Convention in Stockholm.

62. See Bill in the Brazilian Congress (very similar to the Bayh-Dole Act); see also Law No. 10,168, Dec. 29, 2000 (budgetary laws extending the resources to be applied in the scientific community which instituted a tax to finance research activities of universities).

of Fourteen was victorious in the sense that the TRIPS Agreement addresses such concerns in Articles 7, 8,⁶³ 40,⁶⁴ and to some extent Article 67.⁶⁵

There is a great deal of controversy with the interpretation of such articles. Developed countries interpret the provisions as accepting

63. TRIPS art. 8:

Objectives: 1. Members may, in formulating or amending their laws and regulations, adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development, provided that such measures are consistent with the provisions of the Agreement. 2. Appropriate measures, provided that they are consistent with the provisions of this Agreement, may be needed to prevent the abuse of intellectual property rights by right holders or the resort to practices that unreasonably restrain trade or adversely affect the international transfer of technology.

64. TRIPS art. 40:

Control of Anti-competitive Practices in Contractual Licenses: 1. Members agree that some licensing practices or conditions pertaining to intellectual property rights which restrain competition may have adverse effects on trade and may impede the transfer and dissemination of technology. 2. Nothing in this Agreement shall prevent Members from specifying in their legislation licensing practices or conditions that may in particular cases constitute an abuse of intellectual property rights having an adverse effect on competition in the relevant market. As provided above, a Member may adopt, consistently with the other provisions of this Agreement, appropriate measures to prevent or control such practices, which may include for example exclusive grantback conditions, conditions preventing challenges to validity of coercive package licensing, in the light of the relevant laws and regulations of that Member . . .

65. TRIPS art. 67:

In order to facilitate the implementation of this Agreement, developed country Members shall provide, on request and on mutually agreed terms and conditions, technical and financial cooperation in favor of developing and least-developed country Members. Such cooperation shall include assistance in the preparation of laws and regulations on the protection and enforcement of intellectual property rights as well as on the prevention of their abuse, and shall include support regarding the establishment of reinforcement of domestic offices and agencies relevant to these matters, including the training of personnel.

See also Cooperation Agreement Between Brazilian P.T.O. and the European Patent Office, available at http://www.inpi.gov.br/noticias/binpi/200203/mat_5.htm (last visited Apr. 4, 2003).

technological needs of a country as a valid consideration to the extent that they do not interfere with other rights and provisions of the TRIPS Agreement.⁶⁶ Under this interpretation, a multinational that carries out license agreements with developing countries could uphold trade secrets even after the licensed patents expire. Notwithstanding the high caliber of scholars that support this interpretation, the agreement does not seem to fit this interpretation. In all the provisions mentioned before (e.g., Preamble, Articles, 7, 8, 27, 40, and 67), the TRIPS Agreement strives to balance the interests of holders of IP rights with the interests of the general public. In such instances, it is clear that denying protection of know-how trade secrets based on expired patents (therefore leaving it in the public domain)⁶⁷ is more important than having a company continue to explore its own commercial edge based on an expired patent. Although "TRIPS does not establish an operational link between the reinforcing of intellectual property rights, the promotion of domestic technological development and the transfer of technology, it does nevertheless contain some general statements about the importance of technological innovation and the role of transfer of technology in this process."⁶⁸

VI. COMPETING IN THE INFORMATION AGE: THE U.S. EXAMPLE

The Brazilian Congress appears to have acquired a greater sensitivity to the increasing importance of R&D to the overall welfare of the country. A bill is currently being discussed in the Brazilian Congress⁶⁹ purporting to deregulate and decentralize R&D in Brazil, aiming to solve the low rate of innovation. Strong IP rights and government interference in R&D brought economic prosperity to the United States, and should be a source of inspiration to Brazil.⁷⁰ The inspiration, however, should not result in an automatic absorption of the foreign model without critique. With this

66. Gervais, *supra* note 46, at 68-69, 147-48.

67. We are talking about the protection of know-how as trade secrets after the patent term that based the license agreements is expired.

68. Roffe & Tesfachew, *supra* note 2, at 397-99.

69. Projeto de Lei do Senado No. 257, available at http://legis.senado.gov.br/pls/prodasen/PRODASEN.LAYOUT_MATE_DETALHE.SHOW_MATERIA?P_COD_MAT=45957 (last visited Apr. 18, 2001).

70. I do not mean that the U.S. model does not have its own failures. As I will discuss, although failures do exist, they are not inherent to the system. Corrections and adaptations to the Brazilian reality could offer a basis to the pattern of underdevelopment and underutilization of economic resources that has characterized the Brazilian economy.

Article, I aim to illustrate the potential pitfalls and drawbacks that such system may incur.

The U.S. Constitution⁷¹ establishes the basis of the national patent and copyright system. The U.S. Constitution did not underestimate the extraordinary utility that technological advancements could offer towards the development of a new nation. The Copyrights and Patents Clause, Article I, Section 8, Clause 8 accorded the U.S. Congress the right to “promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.” The power to grant the monopoly is extended only to the writings and discoveries of authors and inventors. They are protected to the extent that they promote the science and the useful arts. The constitutional elements of copyrights and patents is in debate now inasmuch as it was two hundred years ago. Recently, there was a constitutional challenge of the Sonny Bono Copyright Extension Act,⁷² which provides for a twenty-year term extension of an otherwise expired copyright. The relevance of copyright to the constitutional system is still present as a basic right, within which developmental choices were embodied. Since the Constitutional Convention, the United States has structurally changed from an importer of IP to an exporter of IP. This change reflects the United States’ actions in the international arena.⁷³ From denying copyrights to foreigners,⁷⁴ to heavy handed negotiations at enforcing comparable rights in the WTO, the United States has changed its policy, in part, to reflect a change in economic conditions.⁷⁵

The United States offers an interesting example of how a system of IP protection evolved to adapt to the economic and developmental needs of the country. Throughout the years, the executive and legislative branches have arguably tried to devise a system that most efficiently utilizes the information generated with federal research grants. In the next section, I will briefly describe the evolution of an innovation procurement system in the United States, and analyze the points advanced by those who endorse and who oppose such system.

71. U.S. CONST. art. I, § 8, cl. 8.

72. Sonny Bono Copyright Extension Act, 17 U.S.C. § 302(a, c), 304 (2003).

73. AUBERT CLARK, *THE MOVEMENT FOR INTERNATIONAL COPYRIGHT IN NINETEENTH CENTURY AMERICA* 22-27 (1960).

74. 4 Stat. 436 (1831), ch. 16, § 8.

75. See William Alford, *How Theory Does — And Does Not — Matter: American Approaches to Intellectual Property Law in East Asia*, 13 UCLA PAC. BASIN L.J. 8 (1994) (for an excellent account of these changes); see also Paul C.B. Liu, *U.S. Industry’s Influence on Intellectual Property Negotiations And Special 301 Actions*, 13 UCLA PAC. BASIN L.J. 87 (1994).

A. *An Historical Overview: Before and After the 1980s*

The evolution of the system of patent procurement reflects the tensions over who should hold title of inventions generated from the money of taxpayers. The system evolved from an outright refusal of government inventions being subject to a patent to more appropriate views oscillating between either government or industry titles.

As a result of the Second World War, President Roosevelt created the National Patent Planning Commission (Commission).⁷⁶ Its purpose was to plan and utilize technology developed during war in times of peace. In its early report, the Commission presented a view between protecting the public domain and securing the right of the government to use the inventions it paid for. Generally, this could be achieved with prompt publication leading to public domain status. However, the Commission acknowledged that fostering economic development of the patent required a patent holding agency to grant an exclusive license to a private party, in certain cases.⁷⁷ The Commission nonetheless avoided creating a general rule of government ownership of patents (title in the government) in conditions greatly diversified throughout the various national agencies.

In 1947, the Attorney General of the United States, in its report to the President recommended as a general policy that title of the patent be with the government in cases of inventions made by government employees or contractors, subject to few exceptions. The report emphasized public goods, the fear of concentrating economic power in the hands of big contractors, and a general dislike towards private appropriation of tax-generated research. In the 1940s, a debate ensued between title policy and license policy. Rebecca Eisenberg notes,⁷⁸ however, that this debate disregarded a third alternative, which was to keep the innovation in the public domain. Although the U.S. Congress did not follow the general provisions of the Commission, it did enact certain policies advanced also by the Commission.

In 1963, the Kennedy administration issued a Presidential Memorandum and Policy Statement to find some a balance between the opposing views of title versus license. The memorandum suggested conditions upon title be granted to the government or to the contractor and was based on studies by agencies of science and technology. For example, when contract research builds upon existing technology, title should be left to the

76. Rebecca Eisenberg, *Public Research and Private Development: Patents and Technology Transfer in Government-Sponsored Research*, 82 VA. L. REV. 1663, 1671 (1996).

77. *Id.* at 1672.

78. *Id.* at 1674.

contractor with technical competence and a commercial position in the field. In addition, the title should be subject to a non-exclusive royalty free license to the government. The government also retained march-in rights in case the contractor failed to bring the application to commercial viability within three years. The Presidential Memorandum did not bring the desired uniformity throughout federal agencies. However, it did lead to further study and the establishment of a Committee on Government Patent Policy, which commissioned a study of government patent policy to the Harbridge House.

The Harbridge House Report (Harbridge Report) was devised to investigate the effects of patent policy (title versus license) on industry participation in government sponsored R&D programs.⁷⁹ The Harbridge Report stated that only 12.4% of inventions that were patented within 1957 and 1962 had been put to use. Among the contractors with prior experience on the field of invention, the Harbridge Report found that 23.8% of invention titles belonging to contractors with prior experience in the field of the invention had some commercial utilization. When the title belonged to the government, the percentage dropped to 13.3%. Eisenberg notes that although these figures may suggest better utilization of inventions whose title belongs to the contractor, the numbers are inconclusive. Within the sample of inventions, 83% were sponsored by the Department of Defense, which already had a policy allowing for contractor titles. The Harbridge Report made no conclusions, but affirmed that there was no evidence indicating a best way to achieve the utilization of inventions sponsored by federal money. The authors of the Harbridge Report expressed that the market potential by itself was insufficient to bring about patent utilization in certain areas, like pharmaceuticals.

As a result of the Harbridge Report, President Nixon issued a Presidential Memorandum, in 1971, where he suggested changes to the Memorandum and Policy Statement on Government Patent Policy by making it easier for private firms to acquire exclusive rights to government-sponsored inventions. The Presidential Memorandum also included provisions granting march-in rights, compelling contractors to grant exclusive and non-exclusive rights. Such concerns were embodied in the Domestic Policy Review on Industrial Innovation, which was led by President Carter, and which intended to increase industrial productivity and innovation. President Carter announced his support to the U.S. Congress, in 1979, of a uniform government patent policy with the aim of promoting industrial innovation. The original proposal was to allow universities and

79. *Id.* at 1681.

small business contractors to retain patent ownership in government sponsored research, and exclusive licenses to other contractors in specific cases. This proposal drew opposition from industry trade groups, who also wanted a piece of the cake.

The Bayh-Dole Act focused exclusively on the part of small businesses and universities. The supporters of the bill argued that including large businesses would result in the bill's defeat by consumer advocates and antitrust lawyers. Accordingly, the bill was passed by the U.S. Congress with no provisions for big contractors. This did not mean that they could not exploit inventions born in cooperative research. They were often able to explore comparable rights under the general administrative policy of the various agencies.⁸⁰

The Bayh-Dole Act triggered the reconsideration of prospective basis waivers, which Institutional Patent Agreements granted to universities. This reconsideration limited the agency's ability to control the availability and cost of such inventions. Under these previous Institutional Patent Agreements, universities seeking to appropriate and license patents did not need to request such authorization on a case-by-case basis. The Bayh-Dole Act put the uncertainties of universities and small contractors to an end.

Supporters of the Bayh-Dole Act point to statistical evidence in the Harbridge Report in which the government failed to provide for the commercial exploitation of patents. Among the patents held by the government (30,000 total), only 325 were commercially exploited. Eisenberg argues, however, that the statistical data in the Harbridge Report was not sound because it reflected only one type of invention. Eisenberg notes that the majority of these patents emerged from Department of Defense agreements which already granted title to the contractor. Furthermore, contractors did not see any commercial future in government patents. Eisenberg points out that among the patents of the Department of Health (325), 23% of those with no general policy of title in the contractor, were exploited commercially.

The original justification advanced by the Bayh-Dole Act to grant patent rights to small contractors was their ability to commercially exploit the invention. Another justification was their familiarity with research results. Justification for universities was a little different. Although one of the justifications was the close relationship between the invention and the inventor, the basic justification was geared towards a better exploitation of patents than that of the government.

80. *Id.* at 1693-94.

Since its passage in 1980, the Bayh-Dole Act⁸¹ has been considered a great success in stimulating the commercial development of discoveries funded by government funds. By encouraging the patenting of inventions that otherwise would be freely disseminated (and appropriated), the Bayh-Dole Act redistributes⁸² some gains from innovation back upstream. This charges the firms that develop commercial products, and rewards both universities and agencies. In contrast, a negative consequence⁸³ to the Bayh-Dole Act in the university setting is the pressure that universities now put on the Patent Office to recognize basic research as patentable. Eisenberg notes that as public research becomes more appropriable, it becomes more difficult to justify. It may also divert the focus of universities from teaching knowledge to commercialization.⁸⁴ Another criticism of the Bayh-Dole Act was advanced by some members of the U.S. Congress who saw a situation in which the "government pays the cost of digging the mine, the contractor gets the gold, and the taxpayer gets the [shaft]."⁸⁵

The devised system was not completed in the Bayh-Dole Act. President Reagan, in an executive order⁸⁶ implementing the Federal Technology Transfer Act (FTT Act), granted lab directors the decision to allow the contractor to keep the patent. While the input side of federal technology transfer is covered by the Bayh-Dole Act, the Stevenson-Wydler Technology Transfer Act (Stevenson-Wydler Act) deals mostly with the output side. The policy consideration behind the Stevenson-Wydler Act was the understanding that agencies should ensure the full use of the results of the federal investment and R&D of the nation. Statutes that later altered the Stevenson-Wydler Act were the FTT Act, the Executive Order 12591 implementing the FTT Act, the National Competitiveness Act of 1991, and the American Technology Preeminence Act of 1991.⁸⁷

81. *E.g.*, 35 U.S.C. § 202 (relevant Bayh-Dole Act provisions are incorporated); *see also* 15 U.S.C. § 3710d (1994).

82. Eisenberg, *supra* note 77, at 1712.

83. *Id.* at 1726.

84. Lawrence Rudolph, *Overview of Federal Technology Transfer*, 5 RISK 133, 135 (1994).

85. *Id.*

86. Exec. Order No. 12,591, 52 Fed. Reg. 13,414 (Apr. 10, 1987). *See* Gov't Cont. Under F. Acquisition Reg. 35.5 (2d ed.) WL 52 FR 13414 (The Executive Order mandated agencies to treat all contractors (big and small) equally, to the extent the law allowed so.) Both the FTT Act and the National Competitiveness Technology Transfer Act extended the scope of the laws to allow national laboratories (government owned and operated, and some government owned, contractor operated) the same regime granted to agencies. *Id.*

87. While agencies directed by the FTT Act to allow employed inventors to patent inventions if agencies do not intend to do so, the Executive Order mandated agencies to treat all

There are several bills in the U.S. Congress that deal with technology transfer. They all acknowledge that federal technology transfer is a pillar to the U.S. economy.⁸⁸ This policy seems to have achieved positive results. Since its implementation, the United States has provided the world with a large share of all inventions in the world.⁸⁹

B. *The Shift in the U.S. International Position: Impact of Historical Changes*

The Framers of the U.S. Constitution attached considerable importance to the country's potential to establish its own technological basis and to evolve from being a country of IP importers to a country of IP exporters. The U.S. Constitution authorizes the U.S. Congress to promote the progress of the sciences and the useful arts. This is performed by securing authors and inventors the exclusive right to their respective writings and discoveries for a limited time. In 1790, the first Copyright Act⁹⁰ was passed to grant (citizen or resident) authors a fourteen-year copyright. In 1831, the statute⁹¹ was revised mainly to increase the term of years, from fourteen to twenty-eight, with the possibility of a fourteen-year renewal granted to the

contractors (big and small) equally, to the extent the law allowed so. Exec. Order No. 12,591, 52 Fed. Reg. 13,414 (Apr. 10, 1987).

88. National Competitiveness Act, H.R. 820, 103d Cong. (1993) (one of the Acts that had the major goal to foster an advanced manufacturing program to help U.S. firms to compete in the international market); see generally S. Rep. No. 103-113 (1993).

[S]upporting the goal of the Bill to promote the industrial competitiveness and economic growth of the United States by strengthening and expanding the civilian technology programs of the Department of Commerce, to enhance the development and nationwide deployment of manufacturing technologies and authorizing appropriations for the Technology Administration of the Department of Commerce.

See also *The National Competitiveness Act of 1993, on H.R. 820 Before the House Comm. On Science, Space and Technology*, 103d Cong., CIS-NO: 93-H701-53 (1993) (statement of Ernest Daman, David Mertes granting support for H.R. 820) (stressing need for Federal programs to promote U.S. competitiveness in manufacturing technology; reviewing of various Federal programs for collecting data on foreign science and technology, with views on potential usefulness to U.S. businesses).

89. RYAN, *supra* note 34, at 2 (1998). Ryan points out that in 1992 around 45% of all industrial R&D in the industrialized countries was carried out in the United States, and that U.S.-based inventors earned about 45% of patents granted by the U.S.P.T.O. and 25% of the European Patent Office. *Id.*

90. 1 U.S. Stat. 124 (1790).

91. 4 U.S. Stat. 436 (1831).

author, widow, or children. This statute also denied foreign authors any protection. Aubert Clark explains that among the reasons for such a unique position in comparison to major European countries, were 1) the ever-increasing literate public; 2) the even faster increasing business of book manufacturing; 3) the lack of developing any literature of its own; 4) and one common language.⁹²

The U.S. policy changed by first allowing protection to foreigners and second by demanding aggressive protection to U.S. works in countries that traditionally did not enforce or even have copyright laws.⁹³ The United States signed the Berne Convention⁹⁴ only in 1988, exactly one hundred and twenty years after the convention first concluded. Among the reasons for implementing the Berne Convention was the rapidly expanding trade in goods. Therefore, domestic industries relying on copyright protection that produce trade surpluses for the United States should be protected. Another factor was that U.S. popular culture had become a precious export commodity of immense economic value. Such values had become unduly eroded by a system with low copyright standards.⁹⁵

After first refusing to sign the Berne Convention, and imposing national working requirements for copyrights of books to later leading the negotiations of the TRIPS Agreement, the United States has come a long way. The economic explanations for these changes are various. The United States was no longer geared primarily towards manufacturing physical goods. One reflection of that is the recent drop in U.S. Steel giving Walt Disney a place among one of the thirty industrial stocks representing U.S. commerce. Why did this change take place? In part because it is very hard to compete with the cheap labor of developing countries, and in part to solving the U.S. balance of payments. Thomas McCarthy makes the point that "if foreign nations do not recognize or enforce intellectual property laws, then America has nothing to sell . . ."⁹⁶

The International Trade Commission placed the U.S. cost of piracy of IP for selected industries at more than \$60 billion per year. This is an amount close to the trade of the United States with the entire world in 1992. The amount is clearly inflated because it does not take into consideration different salaries within different countries, and the

92. CLARK, *supra* note 74, at 27.

93. Alford, *supra* note 76, at 12-24.

94. Berne Convention, *supra* note 8.

95. Berne Convention Implementation Act, H.R. REP. NO. 609, 100th Cong., 11-20 (1988).

96. McCarthy, *supra* note 12, at 814.

price/value that one attaches to IP varies from country to country.⁹⁷ Nonetheless, it is undeniable how increasingly important IP is for the U.S. economy.⁹⁸ For this reason, the United States developed its policies around a stronger IP protection internationally.⁹⁹ Its views were many times accepted under arguable duress. Chinese representatives complained before the WTO that the United States was in fact blackmailing China and Taiwan to grant IP protection to U.S. goods, using access to U.S. markets as a bargaining chip.¹⁰⁰

This was in synchrony with the U.S. foreign policy position within the WTO Uruguay Round of Negotiations. The United States would not grant most favored nation treatment to countries that did not sign the TRIPS Agreement.¹⁰¹ The critics of the placement of the TRIPS Agreement within the WTO framework argued that the main purpose of the WTO was to provide free trade of goods and services, and to reduce the barriers of trade.¹⁰² Nonetheless, the U.S. position was a victorious one in the Uruguay Round of Negotiations. However, the United States has recently had to

97. William Alford, *Intellectual Property, Trade and Taiwan: A GATT-Fly's View*, 1992 COLUM. BUS. L. REV. 97, 99 (1992) (Alford argues that it is unlikely that a young academic in Shanghai whose monthly salary is approximately \$50.00 will be willing to pay \$35.00 for a U.S. law book, no matter how useful the book might be.).

98. S.K. Verma, *The TRIPS Agreement and Development*, in INTERNATIONAL TECHNOLOGY TRANSFER: THE ORIGINS AND AFTERMATH OF THE UNITED NATIONS NEGOTIATIONS ON A DRAFT CODE OF CONDUCT 323 (Surendra J. Patel et al. eds., 2000). Verma notes that:

it had been estimated that in five leading developed countries, foreign trade in technology grew about U.S.D 2.7 billion in the mid-1960s to over U.S.D 17 billion at the end of the 1970s, and the net balance of this trade from about U.S.D 1.1 billion to U.S.D 6.0 billion in the same period. The developing countries are an increasingly important market in this trade.

99. It is interesting to note that the United States did not sign the first attempt to have an international body of trade dispute settlement. The ITO (Havana Charter) was not accepted by the United States probably because of a concern of loss of sovereignty. Gervais, *supra* note 46, at 4.

100. Alford, *supra* note 76, at 100 (citing Winkler, *U.S.-Taiwan Trade Talks*, IP ASIA, Sept. 13, 1990).

101. *Id.* at 23; see also J.H. Reichman, *Universal Minimum Standards of Intellectual Property Protection Under the TRIPS Component of the WTO Agreement*, 29 INT'L LAW. 345, 347-51 (1995).

102. Trips Agreement, *supra* note 5, pmbl. The concern addressed by developing countries was embodied in the preamble of the TRIPS Agreement: "and to ensure that measures and procedures to enforce intellectual property rights do not themselves become barriers to legitimate trade."

retreat from its unpopular position in the area of public health.¹⁰³ The Doha Round embodied the concerns of developing countries, who did not want to be constrained by IP in the face of public health necessities.

VII. PUTTING THE BRAZILIAN BILL, LEI DE INOVAÇÃO, IN INTERNATIONAL CONTEXT

The development of the United States' innovation policy was mainly geared towards fostering the commercial application of scientific innovation. In order to do this, the system evolved from a policy where the government had an unconditional title of the patent, to a policy in which the private initiative and universities were granted rights and duties to pursue commercialization.¹⁰⁴ Notwithstanding the criticisms that such policy has received internally,¹⁰⁵ it is certainly true that the policy of empowering the

103. Rachel L. Swarns, *Aids Drug Deal Expected in South Africa Suit*, N.Y. TIMES, Apr. 19, 2001, World Section (The United States tried to forbid South Africa from acquiring generic medicines based on U.S. patents, but the fight proved too be much controversial and unpopular, and the U.S. pharmaceutical industries decided to drop their claims. Interestingly, the United States seems to have adopted the position it tried to curb when it threatened "march-in" rights for the prescription of the antibiotic Cypro, used in the treatment of Anthrax.); see ABA Comm. on Research and Development and Intellectual Property Minutes (Nov. 15, 2001), available at <http://www.abanet.org/contract/federal/randcomm/minutes/nov152001min.html> (last visited Mar. 6, 2003).

Pursuant to 28 U.S.C. § 1498 (the "authorization and consent statute"), the Government may authorize a contractor to use a patent to which the U.S. has no rights (march-in rights). The patent holder's sole remedy lies in the U.S. Court of Federal Claims for a reasonable royalty; this amounts to compulsory licensing. [The] Government had threatened to invoke 10 U.S.C. § 1498 in favor of competitors in attempting to secure a reasonable price from Bayer Corporation for Cypro. At least until December 2003, Bayer is the sole patent holder for the anthrax antibiotic. . . . [That] the concept of Government interest operates differently from that of the financial world; it is hard to prove reluctance of companies to take part in Government R&D. Harvey Nathan and Will Anderson reported that as of yet there was no official Government position on the Bayh Dole Act; they believed, however, that it would favor greater flexibility.

Id.

104. Eisenberg, *supra* note 77, at 1709-15.

105. There is an ever-growing literature against government interference in R&D. Eisenberg argues that "by allowing private firms to hold exclusive rights to inventions that have been generated at public expense, it seems to require the public to pay twice for the same invention — once through taxes to support research [and] then again through higher monopoly prices . . ." See Eisenberg, *supra* note 77 at 1666; see also Aoki, *supra* note 18, at 42 (discussing the private

universities and private companies with the responsibility of R&D has brought overall positive results to the United States and to other countries that adopt such policies. A recent research study sponsored by UNESCO found a strong correlation between social and economic development and investment in R&D. Among the richest countries and regions (United States, Japan, Europe, and Australia), the investment in R&D is around 1.8 percent of the GDP; the per capita income in those countries is around \$20,000. In Latin American countries, R&D investment is generally not more than 0.7 percent of the GDP while the per capita income is about \$5,000.¹⁰⁶ The increasing importance of R&D to the overall welfare of the country was recognized by the Brazilian Legislature last year when Senator Roberto Freire¹⁰⁷ proposed a bill deregulating and decentralizing R&D in Brazil.

The bill tries to solve low rate of innovation in Brazilian industry notwithstanding the great potential Brazilian scientists have demonstrated in the past and present.¹⁰⁸ To illustrate the type of problem that the bill proposes to correct, we offer the example of the case of the jararaca venom. In 1965, Sérgio Ferreira, from Universidade de São Paulo (USP) was researching the venom of the Jararaca, a type of snake endemic of

appropriation of the public domain in Western countries with the ever increasing IP protection and analogizing with the tragedy of commons, where nobody owns, therefore nobody cares); see also Richard Shelby, *Accountability and Transparency: Public Access to Federally Funded Research Data*, 37 HARV. J. ON LEGIS. 369 (2000) (arguing for more transparency of research data, principally where such data is the basis of legislation. The EPA ordered a study on ozone and particulate matter. Based on the study, a proposal was made to the U.S. Congress that would implicate over \$5-8 billion in regulatory burdening. Senator Shelby criticized that neither the EPA nor the Congressman had access to such data in which the proposed legislation was based.).

106. UNESCO Dossier, available at http://www.unesco.org/courier/1999_05/uk/dossier/intro25.htm (last visited Mar. 18, 2003).

107. Roberto Freire is a senator from Pernambuco, a Brazilian Northeastern state. He was until 1991 the president of PCB, The Brazilian Communist Party. In 1991, under the leadership of Freire the party changed its name and most of its policies because of the failure of the communist regimes in the ex-USSR. Freire is a consensus in the Brazilian Congress, recognized by all the parties as an example. His prestige brought him the highly desired position of leader of government in the Brazilian Congress, notwithstanding his membership to a different party of that of the president. Senador Roberto Freire Web Site, available at <http://www.senado.gov.br/web/senador/rfreire/default.html> (last visited Apr. 4, 2003); Outras Informacoes, available at http://www.senado.gov.br/web/senador/rfreire/outras_informacoes.html (last visited Apr. 4, 2003).

108. Brazil, for example, was the first country to map a plant pathogen. See Ricardo Bonalumé, *Brazil to Sequence "First Plant Pathogen,"* 389 NATURE 654 (1997); Cf. Thomas Prolla, *When Brazilians Achieve, It's Against All the Odds,* 406 NATURE 826 (2000) (letter by a Brazilian scientist arguing that the Brazilian universities suffer from a bureaucratic regime, underpaid professionals, and they are underfunded, which make any attempt to excel a game against the odds).

Brazil, and discovered and isolated a substance in the venom which provoked a sudden drop of blood pressure among people bitten by the snake. The venom of the Jararaca was capable of intensifying the response to bradixinine.¹⁰⁹ The experiment was further pursued by the research group Wellcome Labs, and gave origin to a wide array of anti-hypertensive medicines, among them Capoten, which yields a business of \$4 billion a year.

The Brazilian Bill carries similarities with the Bayh-Dole Act. The main features of the bill are the possibility of scientists, investigators, and small companies to be awarded title or royalties from the product of the invention. The bill also provides for systems of partnership between universities and private industry. It further provides benefitted tax treatment for small companies which carry out R&D activities.¹¹⁰ The bill provides for greater flexibility in terms of employment relationships between researchers and institutions of higher education.

The bill cannot be understood in a vacuum. Complementing legislation has already been implemented. The Brazilian Law No. 10,168¹¹¹ of December 20, 2000 establishes a tax whose sole purpose is to fund programs of technological innovation which in turn foster interactions between universities and private industry. The tax falls under juridical entities that have tech transfer license agreements with foreign entities. The contribution is going to be ten percent of the total contract price. In 2002, the government expects to collect over R \$192 million, or about U.S. \$56.4

109. Sérgio Ferreira and his team discovered in an experiment that the jararaca's venom was capable of intensifying the response to bradixinine. They denominated FPF the bradixinine potentiation factor. The venom had a peptide inhibitor of the enzyme conversor of angiotensin I and II, which were the same enzymes that degrade bradixine. After his discovery, many other peptides were synthesized. The first one was the teprotide. In 1977 Cushman and his team came to the captropil, the beginning of a therapeutical field that started in Ribeirão Preto, with Sérgio Ferreira (information extracted from Sociedade Brasileira de Cardiologia Web site), available at <http://www.cardiol.br/conheca/caminhos/01/5.asp> (last visited Mar. 18, 2003).

110. Embodied in the provision is the hope that the private initiative in the long run will take over the participation now financed by the federal government. In the United States, the shift has already been perceived. Over 60 percent of research is privately sponsored. In Brazil, companies are still in their first steps, but there are some examples of success. The Laboratory Cristalia, a private laboratory, in the state of Sao Paulo, was asked by the USP (U.S. Pharmacopoeia) to provide the standard models of production of the active ingredient sufentanil citrate. See Mauricio Capela, *Cristalia Obtem Reconhecimento nos EUA*, Valor Economico No. 457, Mar. 1, 2002 (on file with author).

111. This law has established the popularly called "Fundo Verde-Amarelo" (Green-Yellow Fund).

million¹¹² based on a new tax to be distributed among governmental R&D programs.¹¹³

Although the sums are still incipient in light of current national R&D needs, the Brazilian government appears to finally acknowledge the economic relevance of technology and innovation to the overall welfare of the nation. Its policies and participation, domestically and internationally,¹¹⁴ show a concomitant commitment to IP protection. They intend to strike a balance of interests to IP holders, and to foster technological innovation in Brazil. The TRIPS Agreement has been implemented through the new law of Patents (Law No. 9,279 of May 14, 1996), where Article 27 of the TRIPS Agreement was construed so to foster technological innovation. The other previously discussed laws show a tendency to shift the economic profile of Brazil to that of a pure importer of technology.¹¹⁵

The new Brazilian momentum towards innovation appears to be a great step in achieving independence and economic prosperity. These are the same qualities the United States looked for in the 1980s when it devised its system of innovation procurement to foster commercial application of innovations. Whether this policy will resist political oscillations in Brazil is not yet known.

VIII. CONCLUSION

In reason of the expiration of Article 31 which gives provisional validity to Articles 8 and 9 of the SCM Agreement that treats R&D as a green light subsidy, since 1999 R&D subsidies may be actionable under the WTO, depending upon the findings of injury to domestic industries. Article 8.2, however, cannot be taken out of context from the WTO framework. Equally so, Brazilian Law No. 10332 has to be understood within the whole framework of WTO. One may conclude that because this law promotes the

112. FINEP Web site, available at <http://www.finep.gov.br/> (last visited May 1, 2003).

113. Brazilian Law No. 10332, art. 1, Dec. 19, 2001, available at <http://www.finep.gov.br/clipping/meio&imagem/u13552.htm> (last visited Apr. 4, 2003).

114. Carta de Genebra, Feb. 2002 (Statement of Position by the Brazilian Mission in the Doha Round, very similar to the final resolution), available at <http://www.mre.gov.br> (last visited Apr. 16, 2003) (portuguese).

115. See Darlene Menconi & Sonia Filgueiras, *Caldeirão da pajelança*, ISTOÉ ONLINE MAGAZINE, Sept. 19, 2001, available at http://www.terra.com.br/istoe/1668/ciencia/1668_caldeirao_pajelanca2.htm (last visited Apr. 4, 2003) (portuguese) (presenting data that Brazil spent from 1989 to 2001 \$11.6 billion for the use of technologies and marks developed and patented overseas. At the same time Brazil sold only \$2.8 billion of products embodying exclusively Brazilian technology).

financing and dividing of R&D subsidies among different industries, it is potentially in conflict with Article 3 of the SCM Agreement. This in turn creates an injury to the domestic industry of other members. The TRIPS Agreement, however, by granting deference and leeway to countries for the pursuit of their developmental needs,¹¹⁶ may act as a counterweight of the prohibition laid out in the SCM Agreement.

Article 1 of Brazilian Law 10332 provides that 7.5% of all tax revenues from the tax created by Law No. 10168 will go to the R&D necessary for the aircraft industry. Is Law No. 10168, which is the Brazilian version of the TCP found illegal by the WTO?¹¹⁷ It is hard to have a clear-cut answer to this problem, since 1) when the decision was rendered Article 8.2 of the SCM Agreement was still in force, and 2) Canada did not and does not receive the benefit of Article 27.4 granting special benefits for developing countries. I would argue that the requirement of fostering developmental needs of members and the exception of the SCM Agreement for developing countries favor a positive interpretation of Law No. 10332.

Although governmental subsidies to R&D activities appear to foster economic prosperity and promote wealth to the country adopting a policy of innovation procurement through governmental subsidies, other considerations should also play a role when one particular country decides to adopt such subsidies. For example, a subsidy may weaken the argument that a patent should be protected in order to foster further R&D. Another consideration is that in the area of pharmaceuticals. The example of patents acquired through governmental grants and later enforced against foreign countries without conditions to buy the patented product demonstrates the discrepancy and the potential unfair results to which such policies can lead. Notwithstanding, I argue that governmental participation in the national R&D efforts is a legitimate way for a country to achieve the technological independence needed for economic development and prosperity. Accordingly, the role of government R&D should diminish, as national industries take a leading role in sponsoring innovation. This is precisely the case in the United States today, where governmental participation has been

116. See TRIPS pmb., arts. 7, 8, 40, 67 (The Brazilian Bill clearly grants more flexibility and encourages partnership between small to mid sized companies and universities in the R&D process.).

117. Department of Foreign Affairs, *supra* note 28.

decreasing,¹¹⁸ while private participation has been dramatically increasing in the past decade.¹¹⁹

118. National Science Foundation, *supra* note 32.

119. National Science Foundation, Division of Science Resources Studies, *U.S. Industrial R&D Performers Report Increased R&D in 1998* (showing that between 1997 and 1998 industrial R&D performed by private industries raised 9 percent, whereas federal funding R&D stayed leveled), available at <http://www.nsf.gov/sbe/srs/databrf/sdb00320.htm> (last visited Mar. 18, 2003); see also National Science Foundation, *supra* note 32.

