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STANDARD SETTING

-- Background Note by the Secretariat --

14 June 2010

The attached document is submitted to Working Party No. 2 of the Competition Committee FOR DISCUSSION under item III of the agenda at its forthcoming meeting on 14 June 2010.

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STANDARD SETTING AND COMPETITION POLICY

Background Note by the Secretariat[*]

1. Introduction

1. Standard setting is the process of determining a common set of characteristics for a good or service.[1] Standard setting covers many different outputs[2] and processes, from table salt quality to motorcycle-wheel size to gasoline formulations to computer chip protocols.[3] This paper reviews standard-setting issues relevant for competition law and policy.

2. Standard setting has long been a focus of competition policy. This focus will inevitably remain, given that standard setting often involves close cooperation among potential competitors. This does not mean that governments should have extensive competition-related oversight of standard setting. The appropriate role of government is still a matter of debate. But an underlying fact is that standard setting delivers substantial economic benefits while only rarely resulting in competition law litigation. A proportionate policy response to competition concerns from standard setting is therefore unlikely to involve broad requirements for standard setting processes that may have substantial, costly and widespread unintended consequences. Having said this, governments can take many actions to ensure competition policy concerns are addressed in the standard process, notably by: ensuring that the standard-setting organisations (SSOs) do not promote illegal activity, such as joint price-setting by competitors, limiting the incentives of firms to act deceitfully in the standard setting process, promoting internationally recognised standards, assuring mutual recognition of conformity certificates and certification bodies and ensuring that conformity assessment does become an unduly costly barrier to entry.

3. Standards arise from a variety of sources. Many countries rely on market operations, such as (SSOs), to develop a largely-private regulation of product markets. The interconnectedness of high-technology products raises additional challenges for standard-setting bodies. Government-set standards[4] often affect subsequent conditions of competition in a sector.

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[*] This paper was prepared by Sean F. Ennis, with some material adapted from the background note for the OECD Competition Committee roundtable on Competition, Patents and Innovation II.

[1] A more formal definition is: "Technical regulations and standards set out specific characteristics of a product — such as its size, shape, design, functions and performance, or the way it is labelled or packaged before it is put on sale. In certain cases, the way a product is produced can affect these characteristics, and it may then prove more appropriate to draft technical regulations and standards in terms of a product's process and production methods rather than its characteristics per se." Source: http://www.wto.org/english/tratop_e/tbt_e/tbt_info_e.htm.

[2] Outputs can include goods, services, rules for interaction between goods (e.g., interoperability standards) and information.

[3] Perhaps surprisingly, all the standards just mentioned can involve restrictions to competition.

[4] If obligatory, these are called "technical regulations".

4. Standard setting is particularly prone to anti-competitive behaviour because standards are often set by groups that include actual and potential competitors. Standards can have the effect of excluding non-chosen technologies. Standard setting can yield cost advantages for certain technologies and can have substantial influences on the prices paid by consumers as well as product variety. Some recent competition law cases have alleged that firms on occasion "ambush" the standard setting process by urging a standard-setting body to promote a technology which standard-setting body members believe will be accessible at no cost or low cost and then patent key elements of the standard and charge "excessive" royalties. Policy responses to deter standard setting ambushes are a challenge. For example, SSOs may be urged to discuss prices for different technologies prior to setting the standard to avoid ambush, but these announcements and decisions based on them could increase risks of collusive price fixing.

5. To promote effective competition policy in the areas where standard setting is ongoing, there is a twin set of challenges for policymakers. First, policymakers must understand how standard-setting bodies operate. Second, they must decide whether any government role is appropriate government support and, if so, what role.[5] One possible government response is *ex post* application of competition law or other legal remedies. *Ex ante* options are also considered, such as government-established rules about how SSO bodies operate. Deciding among all the options, including the option of no action, requires evaluating costs and benefits of different approaches. Use of competition law in the government oversight of standard setting may help to avoid more invasive forms of oversight, such as direct government development of standards, SSO governance practices and price regulation of intellectual property used for standards. In all instances of government action, it is important to recall that standards can become actual or de facto international standards. As a result, application of competition policy in one jurisdiction can at times have extra-territorial implications. Achieving a consensus about appropriate policies is thus particularly important.

6. This paper is not intended to provide an overview of the wide-ranging legal and economic scholarship on competition policy issues related to standard setting. Rather, it presents a framework for considering and evaluating potential best practices.

7. A number of points emerge. These include:

- The standard setting process, taking into account all different types of standards, is extraordinarily complex.

- The benefits of allowing firms to jointly discuss standards with each other, or potentially in conjunction with the government, are substantial. For example, standards help to integrate complementary intellectual property with separate owners. Policy makers should begin with the rebuttable presumption that standard setting is a legitimate activity that yields substantial economic benefits.

- There are clear and known risks of illegal coordination or undue restrictions on competition from standard setting processes. Longstanding examples would include price setting and market allocation among competitors.

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5 For the treatment of standardisation agreements in the European Union, see the European Commission Notice, Guidelines on the applicability of Article 81 of the EC Treaty to Horizontal Cooperation Agreements, OJ 2001 C 3/2, Chapter 6. The European Commission is preparing new horizontal cooperation guidelines which are close to completion at the time of writing this note. The U.S. Department of Justice and U.S. Federal Trade Commission published joint "Antitrust Guidelines for the Licensing of Intellectual Property." 6 April 1995 available at: http://www.justice.gov/atr/public/guidelines/0558.pdf.

- A more recent example of risks occurs when standards are "ambushed" by a company that conceals relevant patents until a standard has been set and then sues for infringement. Patent ambushes are an activity with no redeeming social benefits. Competition agencies sometimes combat patent ambushes by allowing and advocating certain *ex ante* measures by SSOs, such as rules on disclosures, negotiations of licensing terms. Agencies may also take enforcement action against ambushers.

- Efforts to mitigate potential harms from standard setting may have unanticipated effects.

- Conformity assessment raises important and largely ignored competition policy issues. While designed to ensure that products meet a standard, conformity assessment policies merit review, especially when governments require duplicative assessments that are substantially equivalent or when governments or SSOs limit the number of assessors in a way that may restrict the number of suppliers of conformity assessments for a given standard and lead to high prices for certification.

- Governments can usefully:

  - Be cautious when considering instituting widespread obligations on the standard setting process, taking into account the international context of many standards;

  - Evaluate any decision to step into specific disputes in the standard setting arena; and

  - State any general principles for identifying and penalising illegal conduct in advance, taking into account that seeking the best technical standards is an activity that often benefits from joint action by potential competitors.

This paper will focus primarily on identifying the benefits and potential harms from standard setting, leading into a discussion of mitigation measures for some potential harms. The paper concludes with a discussion of conformity assessment. Prior to this, the paper will identify the main functions served by standards and discuss how they are set.

2. Types of standards

8. Prior to discussing the benefits and potential harms from standard setting, it is important to identify the types of standards that exist and how standards are produced. Standards perform a variety of different functions. Five broad categories of standards are:[6]

- Quality standards;

- Informational standards;

- Uniformity standards;

- Professional conduct and certification standards; and

- Interoperability standards.

[6] These categories may involve some overlap between each other. For example, professional certification standards are arguably a type of quality standard. See ABA Section of Antitrust Law (2004) for more details.

The potential competition policy concerns with a standard depend on its function and on the fact pattern of how the standard is developed and used.

9. *Quality standards*. Quality standards define product characteristics related to safety, performance or efficiency. These standards may prevent dangerous or undesirable products from entering or succeeding in the marketplace. Quality standards can enhance consumer welfare by providing information and assurance of satisfactory and non-dangerous goods.[7] Products that fail to meet a quality standard may be excluded from a market or fail to receive certification from a conformity assessor or SSO. Quality standards set by government[8] will often exclude non-conforming products from the market. Privately established quality standards will not exclude a product legally but will serve largely to provide information to consumers. Quality standards can serve as barriers to entry. Even when privately set, a firm may propose a standard that would give its product an advantage over a competitors equivalent but non-identical product.[9]

10. *Informational standards*. Informational standards provide measurement and test of products and result in information that can be distributed to buyers, sellers and other users of a standard. It does not define a product characteristic but sets parameters for types of information to be communicated about the product. For example, standards for reporting nutritional content of food products may yield information about fat content levels for different types of fats. The introduction of such standards can affect competitors differently.[10]

11. *Uniformity standards*. Variety reductions standards seek to reduce the proliferation of product categories. Reduction in variety can enhance the achievement of economies of scale. Reducing the variety of sizes of canned vegetables, for example, both increases the scale of production at each remaining size and enhance the ability of consumers to store their cans compactly. However, at times uniformity standards can reduce consumer choice to suboptimal levels and facilitate collusion by eliminating competing versions of underlying technologies.[11, 12]

12. *Professional conduct and certification standards*. Trade associations often set standards governing professional conduct and certification. Conduct standards may include ethical standards or rules on advertising, for example.[13] Certification standards may include criteria that must be met by professionals performing certain actions. These standards can convey valuable information about the training and competencies of professionals. At times, certification standards may be excessive for the

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7 Standards can apply not only to products and services but also to generic management systems. ISO 9001 and ISO 14001, for example, create standards for a quality management system and environment management system, respectively.

8 Standards mandated by government are often called technical regulations.

9 See Link (1983), p. 395.

10 See ABA Section of Antitrust Law (2004), p.9

11 For example, standards governing fruit production have, in the past, become stricter over "minimum size" at times of high production, thus having the effect of limiting fruit sold through fresh outlets apparently for the benefit of producers against the benefit to consumers.

12 See ABA Section of Antitrust Law (2004), p. 9.

13 In many jurisdictions, ethical standards have been used to limit price competition between professionals. (See, e.g., Wilk et al. v. American Medical Association (1987) Judgment (Northern District of Illinois, Eastern Division No. 76 C3777.)) Advertising standards have at times prevented professionals from advertising boldly or from mentioning prices in advertisements.

performance of a given task and unduly limit supply of certified professionals rather than simply ensuring good quality.

13. *Interoperability standards*. Interoperability or compatibility standards ensure that two or more related products or processes will fit, operate or communicate with one another. One benefit of such standards is that they allow interchangeability of complementary products. (Farrell and Saloner (1986)) One example is the interfaces used for personal computers. USB ports allow a given personal computer to connect with multiple printers, just as they allow multiple printers to connect with a given computer. Interoperability standards facilitate competition among providers of complementary products, facilitate entry or expansion of competitors in these markets and can create environments conducive to innovation and patenting in these complementary markets. Interoperability standards can have large effects on efficiency. One study concluded that imperfect interoperability between computer systems in the automotive supply chain results in costs of at least one billion dollars per year.[14] Interoperability standards can have negative impacts if the standards slow innovation of the standardised product or unduly constrain product design.

3. How are standards set?

14. From one product or service area to another, the need for standards varies. The ways in which standards are established and verified may vary according to the specific needs of a given standard setting objective.

15. Standards have 3 main sources:

- Industry collaboration;
- Government standard setting; and
- Uncoordinated processes.

16. These sources will be discussed in sequence. Potential policy issues vary according to the source of the standard in question.

3.1 Industry collaboration

17. Industry collaboration occurs largely via SSOs or, at other times, trade associations with broader agendas than standard setting that undertake standard setting as one part of their activity. Standards set by industry collaboration are frequently set through consensus after wide discussion in the industry. For this reason, participation in the standard setting process is often unrestricted (i.e. non-members are allowed to participate) and transparent. This is normally the case for standards adopted by the recognised standards bodies which are based on non-discriminatory, open and transparent procedures. When customers are members of the standard setting body, there is less likelihood of anti-competitive agreements being formed against the interests of consumers.

18. Dedicated standard setting organisations include

- *International organisations*, such as the International Organization for Standardization (ISO), International Electrotechnical Commission (IEC), and the International Telecommunication Union (ITU) are governed by national standard-bodies. National standard bodies have varying

[14] See Brunnermeier and Martin (1999).

degrees of government and private oversight. Examples of national standards bodies include the Brazilian National Standards Organisation (ABNT), the American National Standards Institute (ANSI), the British Standards Institution (BSI), the Mexican Dirección General de Normas (DGN), the Deutsches Institut für Normung (DIN), the Instituto Argentino de Normalización y Certificación (IRAM), the Japanese Industrial Standards Committee (JISC), the Korean Agency for Technology and Standards (KATS), the Nederlandse Norm (NEN), the South African Bureau of Standards (SABS), the Standardisation Administration of China (SAC), the Standards Council of Canada (SCC), the Swedish Standards Institute (SIS), Standards Norway (SN), the Swiss Association for Standardisation (SNV), or Standards New Zealand (SNZ). There are also multinational bodies, notably in Europe, such as the European Committee for Standardisation (CEN). Figures help to illustrate the variety and volume of standard setting activity. At ISO, there were 3238 technical bodies developing standards, with 18,083 standards on record as of 31 December 2009. The ISO standards are only a small portion of total worldwide standards.[15]

- *Product or industry-specific standard setting organisations*. Examples of such organisations are highly varied. Electronic and telecommunications oriented bodies include: the Joint Electron Device Engineering Council (JEDEC), European Committee for Electrotechnical Standardisation (CENELEC), the European Telecommunications Standards Institute (ETSI) and the European Payments Council (EPC).

19. Professional bodies and trade associations. The borderline between standard setting organisations and trade associations are not always clear. Professional and trade associations tend to have a broad mission that can include, in addition to standard setting and certification, sharing news of industry interest, lobbying, providing training, providing professional advising, running conferences, etc.. Professions or trade associations often set product or performance standards, particularly with the objective of ensuring quality of products or services overseen by the association. Some of these services can have the effect of limiting supply. Limiting supply is not always harmful. For example, medical associations establish training and other requirements for doctors that are intended to prevent people with inadequate training from calling themselves doctors.[16]

3.2 Government standard setting

20. Governments may take a variety of positions for setting standards. They can serve as very active participants in setting standards, as happened with the GSM mobile phone standard in Europe. They can serve as a registration and enforcement service for standards. At times, governments may have no involvement at all.

21. Governments in different countries do not always adopt the same approach to a given technology. For example, with second generation (2G) mobile phone standards, developed in the late 1980s and early 1990s, European governments pushed for a particular standard (the Global System for Communications standard, or GSM) and adopted it as mandatory. The Pacific Digital System was adopted by the Japanese government. The U.S. government chose to leave the standard creation for the second generation systems to the private sector.

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15 For example, one source estimates there were 52,000 U.S. government standards in 1995 and 41,500 private standards. (See ABA Section of Antitrust Law (2004), p.4)

16 Some professions have established limits on the number of training places. While such limits may create substantial restrictions on competition, they are not related to standards or certification procedures so would not be treated in this paper. Certification procedures that limit entry or unduly high, to reduce entry, would fall under the rubric of standard setting.

22. Government-industry collaboration in standard setting may provide the best outcomes in some cases. Government standard setting can move faster than industry standard setting, largely because governments can act by dictate but private standard setting requires voluntary agreement among parties who often have conflicting financial interests and a consensus decision-making process. However, industry participants likely have better information about quality/price tradeoffs for technology as well as key elements of standards for commercial success. The active involvement of industry in a government-led standard setting process may provide a combination of the benefits of speedy action with state-of-the-art technical and commercial considerations.

3.3 Uncoordinated processes

23. Standards sometimes develop simply through the general adoption of products made by one company or entity. For example, as personal computer users increasingly purchased computers with Microsoft operating systems, Windows increasingly became a de facto standard for programmers creating applications for personal computers. Adobe essentially created a common standard for computer readable documents with its PDF file system. Sometimes private innovations are adopted with such universality that they become de facto standards.

3.4 Process followed

24. Once a decision has been made to establish a standard, a group of experts will be brought together, often within the context of a larger umbrella SSO.

25. The process of creating standards by SSOs is often governed by a set of rules specific to the given standard or SSO. These will often include rules about:

- Who can vote and provide input on new or revised standards;
- What is the formal step-by-step process for standard development;
- What information about commercial interests (e.g., IP) must be revealed and when;
- What type of consensus is needed for an outcome; and
- How negative votes or ballots are handled.

The development time for a single standard can take years, whether the standard is created by a private SSO or by government. As a practical matter, governments may be able to establish standards more quickly than consensus-based SSOs.

4. What are the benefits from standard setting?

26. Standards serve many different purposes and cover many different products, so their benefits can be varied. Broad social, safety and environmental objectives underlay many standards.

- Human health and safety standards account for the largest number of standards, according to the WTO.[17] Examples include seatbelt regulations, electrical socket standards and cigarette labeling regulations;

[17] See http://www.wto.org/english/tratop_e/tbt_e/tbt_info_e.htm.

- Protection of animal health and safety is another important motivation for many standards. Examples include animal food standards; and

- Protection of the environment motivates many standards. Regulations to reduce air, soil and water pollution are increasingly common. Examples include standards related to auto emissions, recycling of plastic products and energy-efficiency labels.

27. The macroeconomic benefits of standards are likely significant. The German national standard-body DIN finds that the economic benefits of standardisation are about 1% of GNP.[18]

28. Standards can promote better operation of markets. Market-related benefits can include a number of related factors:

- Facilitating market creation by creating an environment in which consumers are ready to commit to product;

- Achieving economies of scale and user externalities;

- Facilitating market entry;

- Improving firms' incentives to innovate; and

- Lowering information costs and preventing consumer deception.

4.1 Facilitating market creation

29. Standards can help to create markets where none might exist otherwise. Certain products require coordination and investment among diverse companies and products in order to achieve a technological improvement. High definition television (HDTV) is a good example of a product that may require such coordination. High definition television is a major improvement over previous standards, such as NTSC in the U.S. and Japan, or PAL and SECAM elsewhere. An HDTV system requires a standard for the HDTV signal, programming that is produced in that format, televisions that are capable of showing that format and transmission infrastructure that is capable of distributing it. These complementary elements need to be introduced nearly simultaneously in order for investments to make sense. Moreover, a chicken and egg problem arises. Consumers are unwilling to purchase HDTV television sets unless there is programming available for these sets and broadcasters are unwilling to substitute expensive new equipment for older operational equipment unless they can identify a clear audience or other financial benefit from adoption.[19] If there is no HDTV standard established, it is particularly unlikely that consumers, broadcasters and producers of programming will adopt the new technology.

30. One interesting case illustrating what can happen when no standard is established concerns stereo AM. Stereo AM was proposed and alleged to have a number of characteristics superior to FM stereo. In the face of competing proposals for AM stereo radio standards, the U.S. Federal Communications Commission (FCC) ultimately decided for a "marketplace" approach. Three benefits of this approach were identified. The first is that private parties would know the intensity of their preferences over the different characteristics of the systems. The second is that developments of better systems would proceed at a greater pace than would occur under FCC management. The third is the marketplace approach avoids

18 See DIN (2000), p.28.

19 See Farrell and Shapiro (1992) for a detailed discussion of challenges in HDTV adoption.

granting a monopoly to one manufacturer. The FCC did issue some rules to ensure monophonic compatibility, ensure international agreements would be followed and avoid interference but stayed away from making any judgements about competing standards. The industry was not able to agree on a standard itself. The results were chaotic. Multiple non-compatible systems were installed by radio stations and listeners. After 3 years of operation, 90% of radio stations had not adopted stereo broadcasting and a very small percentage of users had receivers capable of receiving stereo AM.[20] This suggests that absence of a standard, in this case, did not help the rollout of successful stereo AM products.

31. Establishing a standard does not necessarily mean the product will be successful. For example, in 1992, it appeared that Digital Audio Tape (DAT) would be the successor to analog audio cassettes in much the same way that CDs were the successor to vinyl records. However, DAT was not as successful as the CD format. The reasons included high cost of players, lack of music distributed on DAT tapes and legislation that limited sound quality to ensure perfect digital copies of music could not be made.[21]

32. Second generation mobile phones provide an example of contrasting government approaches to market creation. (See Box 1.)

Box 1. Second Generation Mobile Phones: Alternative Approaches to Standard Setting

An interesting case study in standards creation and adoption relates to second generation (2G) mobile phones. The interest lies in comparing the rollout of a government-overseen standard in Europe to competing standards in the United States, where the government chose to allow standards competition.

The European Union, acting in response to analog, first generation mobile phone systems that were largely incompatible across its member countries, sought a unified standard. In 1982, the Conférence des Administrations Européennes des Postes et Télécommunications (CEPT) decided that a digital standard was needed and established a working party to develop a standard. This standard was ultimately set in February 1987 under the name Global System for mobile Communication (GSM). The digital standard chosen was not the proprietary Alcatel-SEL standard that would have been favorable to the German and French telecom industries. In May 1987, the four largest markets in Europe – France, Germany, Italy and the U.K. – signed a Memorandum of Understanding to commit to the deployment of the GSM standard. By September 1987, 13 other countries had committed to roll out the standard.[22] By 1989, Germany had awarded a GSM concession. By the end of 1993 there were more than 1 million subscribers in Europe.

The U.S. adopted a decentralised approach to digital standardisation, allowing competing standards to form and compete with each other. The U.S. assigned "PCS" spectrum to for new purposes of mobile calling, but did not mandate a specific standard. The Federal Communications Commission (FCC) had endorsed a single standard for first generation mobile phone services (AMPS) by requiring use of a given technology in its licensing process. The U.S. started to revise its first generation systems somewhat later than Europe. Starting in 1985, the Cellular Telephone Industry Association (CTIA) began an evaluation of alternative technologies. The FCC determined that it would not determine a standard for second generation technology, citing its limited resources and expertise.[23] This review was endorsed by both cellular telephone companies and equipment manufacturers. In 1989, CTIA members voted for TDMA as the standard for 2G mobile phone systems. In 1992, the Telecommunications Industry Association (TIA) published the TDMA standard. (IS-54) But deployment was slow. In the meantime, the competing

20 See Besen and Johnson (1986).

21 Commercial music companies were concerned that DAT would allow unlimited perfect digital copies of commercial music.

22 In 1989, CEPT transferred the GSM Committee to ETSI which finalised the system specifications.

23 The FCC had previously experience with selecting standards and then changing its position. It established a standard for AM stereo and the reversed itself. Similarly, it had established the CBS standard for colour television and reversed itself to adopt the RCA standard. (See Besen and Johnson, 1986.)

CDMA technology had caught up in being ready for commercial use. In July 1993, the TIA published a CDMA standard. (IS-95) The U.S. only completed its first auction of PCS spectrum in March 1995. By this time, every country in Europe had at least one GSM operator.

In both cases, setting a standard was an essential precursor to successful investment in and commercialisation of digital "second generation" mobile phone technologies. However, in one case, the standard setting was performed by the government and ultimately with a view to ensuring that proprietary systems were avoided. (Europe) In the other case, private sector decision-making was allowed to establish competitive standards that would operate over one band of spectrum. (U.S.) Some observers suggest that the CDMA standard was technically superior to the GSM standard.[24] But the GSM standard reached consumers (in Europe and elsewhere) well in advance of the dualing U.S. standards reaching U.S. consumers. Second generation rollout in the U.S. may have been delayed by leaving the standard setting to the market rather than government decision making.

4.2 Achieving economies of scale and user externalities

33. Standards often reduce variety, ensuring that production will be standardised around fewer design variables and promoting increased economies of scale. For example, DASA-Airbus estimated that customised parts cost 15 times more than standardised parts, for equivalent parts. It further found that about 50% of customised parts were "suitable for standardisation".[25]

34. Compatibility standards may have additional effects, notably user externalities (often called network externalities) from users being able to interact with other users. These occur through a communications network, through sharing software that runs on a common operating system or exchanging multimedia recorded in the same format. Increasing the number of users, through ensuring compatibility of products, means that consumers place an increased value on their own use of a product.[26]

35. In a recent business review letter, benefits of compatibility standards are explained in terms of user externalities. "Interoperability standards can enable consumers to share information with each other and to interconnect compatible products from different producers. In addition, the collaborative standard-setting process can enable industry participants to share knowledge and develop a "best-of-breed" product or process. Especially in industries with network effects, the collaborative standard-setting process can enlarge markets by overcoming coordination failures among those interested in developing and using the standard so that the products are available to, and used, by more consumers."[27]

36. The value of user externalities and cost reductions available to enterprises from using the Internet is large. These cost reductions are possible only because users are available on the platform that uses a standardised communications protocol. Varian et al. estimate that, French, Germand, UK and U.S., "organizations that are currently deploying Internet business solutions *expect* to realize" more than $.588 trillion in cost savings "once all Internet businesses solutions have been fully implemented by 2010." (Varian et al., 2002)

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24 See, for example, Tan (2001). At the time of rollout, the technical superiority for moving data was less important, because data applications over mobile phones were rare.

25 See DIN (2000), p. 33

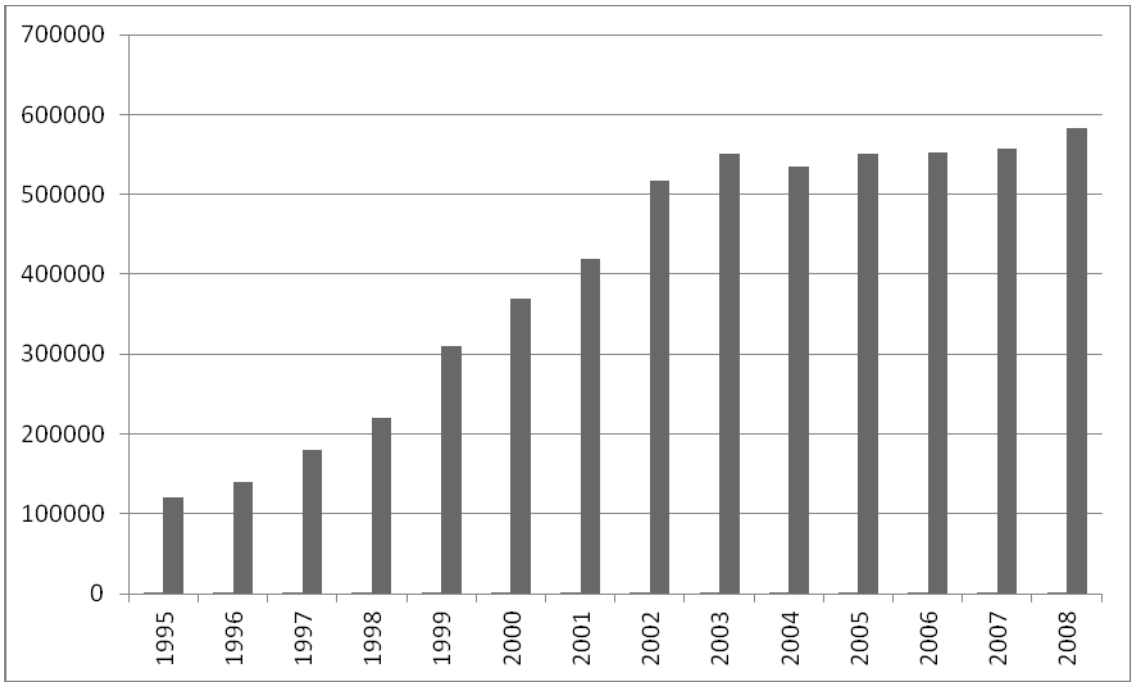
26 See Katz and Shapiro (1985) and Farrell and Saloner (1985).

27 See Letter from Thomas 0. Bamett, Assistant Attorney Gen., U.S. Dep't of Justice, to Robert A. Skitol, Esq., Drinker, Biddle & Reath, LLP, Oct. 30, 2006, re VMEbus International Trade Association (VITA) available at http://www.usdoj.gov/atr/public/busreview/129380.pdf.

4.3 Facilitating market entry

37. Standards can help to facilitate new entry to product markets. For example, organic standards and certification help to ensure that farmers who invest in organic production can distinguish their products from non-organic products in a manner that is reliable to end customers. Absent a standard, non-organic producers could have the incentive to denominate their products as organic, since prices for organic foods are typically higher than for comparable non-organic foods. The organic food standards ensure that farmers have an incentive to become certified organic producers. The European Union introduced a standard for organic food in 1991.[28] Figure 1 shows the area of French land in bio production increased by a factor of five between 1995 and 2002.

Figure 1. Area in bio production, FR 1995-2008 (in hectares)



Source: Agence Bio, France, L'agriculture biologique, ChiffresClés, 2009

4.4 Improving firms' incentives to innovate and invest

38. Incentives to innovate do not depend exclusively on intellectual property (IP) protection. Ultimately, incentives to innovate are dependent on expected profits from investment. Expected profits arise from many factors not related to IP, such as bringing products to market before other companies, manufacturing profits using the innovation, increased profits from increasing the perceived or measurable qualities of the product. Importantly, expected profits from commercialisation of investment can depend substantially on packaging an innovation with other innovations (as in a high technology standard) or motivating consumers to purchase a new product. To motivate consumers and to establish packages of complementary innovations, standards can serve a crucial role.

39. Investment is not focused exclusively on innovation. Investment can be motivated by the incentive to increase capital. Returns to capital can be enhanced by the existence of standards. For

[28] See Regulation EEC 2091/92.

example, the beneficial impacts of occupational licensure include encouraging investment in human capital that enhances quality of service. (Shapiro (1986))

4.5 Lowering information costs and preventing consumer deception

40. Standards provide benefits in part because they decrease the consumer's cost of gathering information and searching for the appropriate products.[29] Agro-food products are often experience goods (quality known after consumption) or credence goods (quality not identified even with consumption, as with organic foods). For such goods, trustworthy signals are important for maintaining consumer confidence. In absence of such signals, low-quality production will reduce willingness of consumer to purchase the product, and thus reduce the incentive of high-quality producers to maintain quality.

41. The beneficial impacts of occupational licensure include reducing consumer uncertainty about the quality of the product. (Arrow (1963)). Medical associations establish standards and certification programs for doctors in large part because consumer information is limited in at least three respects:

- The quality and capabilities of their practitioner;
- The *ex ante* appropriateness of the care suggested; and
- The *ex post* effectiveness of the care.

42. Health care services are often "credence" goods: even after buying them, a consumer may not be able to judge their quality adequately. This feature of health services arises both because of imperfect consumer information about the physical outcome of care and the fact that appropriateness of care and outcomes are not perfectly correlated. Sometimes appropriate care yields poor outcomes and inappropriate care yields good outcomes. These information problems mean that consumers must often rely on external sources for judgments about care.

43. A non-regulatory solution might exist in publishing simple empirical indicators of quality. In their crudest form, indicators could look at survival rates from high-risk surgeries. Given that the best surgeons often see the most difficult cases, a perverse result could arise in which survival rates for the best surgeons could be lower than those of the worst surgeons. Standards with certification are not equally subject to such perverse results.

5. What are the potential harms from standard setting?

44. As just described, standard setting has many benefits. It also can be associated with harms. These may include:

- Facilitating exclusion and quantity constraints;
- Promoting coordinated high prices;
- Picking a winner that would not maximise social welfare;
- Picking a winner through deceit (patent ambush); and
- Yielding asymmetric cost impacts.

[29] See Carlton and Klamer (1983).

45. These harms are closely related. For example, anticompetitive exclusion is a form of output restriction that may lead to higher prices. Each of these harms is explained below. The potential for harm is recognized by the courts. The U.S. Supreme Court has stated that collaborative standard setting organisations may be "rife with opportunities for anticompetitive activity."[30]

46. Factors to consider for the analysis of the competitive effects of standard setting include:

- Percentage of appropriately defined market included within the standard;
- Whether producers exclusively use the standard;
- Whether incentives of different participants diverge, making anti-competitive agreements difficult; and
- Whether efficiencies can be achieved in a manner that does not include producer cooperation.

5.1 Facilitating exclusion

47. Standards can exclude potential providers of a service via criteria that are necessary to meet a standard. The risk of exclusion arises especially in the context of standards that are set by a group of competitors. Exclusion can occur via "manipulation" of a standard to exclude quality products of competitors. Such concerns are more serious if the competitors had no voice in the standard setting process or if the standard is mandatory.

48. Distinguishing manipulation from normal promotion of private interest can be challenging, particularly as standards do often need to make choices between competing technologies. Moreover competitors participating in a standard setting process generally have an incentive to favour their own products. At times, companies may unilaterally or jointly seek to alter the outcome of an SSO. For example, several steel manufacturers were alleged to have agreed to oppose a standard that would have accepted the use of polyvinyl chloride for electrical conduit. The colluding manufacturers allegedly recruited more than two hundred people to join the relevant trade association and vote against the proposed standard.[31] This action led to a private case for damages against the alleged colluding manufacturers.

49. An interesting recent case on exclusion of competitors involved vehicle recovery systems in South Africa. See Box 2 for more information on this case.

Box 2. South African Vehicle Recovery Systems

A recent judgment of South Africa's Competition Tribunal suggests how exclusion can operate.[32] In South Africa, car theft became a serious problem in the late 1980s. Up to that time, devices commonly used to reduce theft were gear locks or car alarms. But with increasing levels of theft and recovery rates of stolen cars around 20%, insurance companies sought alternative sources of protection. In the early 1990s, stolen vehicle recovery (SVR) systems became much more common. These systems included installation of a geo-location device that allowed a stolen car to be tracked and found. Providers of SVR services would often perform the recovery themselves. When

30 See Am. Soc'y of Mech. Eng'rs, Inc. v. Hydrolevel Corp., 456 U.S., 556, 571 (1982).

31 486 U.S. 492 (1988)

32 Competition Commission and Tracetec (Pty) Ltd and Netstar (Pty) Ltd, Matrix Vehicle Tracking (Pty) Ltd, Tracker Network (Pty) Ltd and Vehicle Security Association of South Africa, Case No: 17/CR/Mar05, Judgment of 19 April 2010.

cars were fitted with tracking devices, recovery rates rose to 70%.

VESA was a trade association started in 1987. According to the Competition Tribunal judgment, "Its membership comprises firms involved in the vehicle security industry and includes manufacturers, suppliers, installers and maintenance firms. Firms are competitors of one another and are organised into sub-committees relevant to their market niche." VESA established an SVR subcommittee and developed standards for providing SVR services. The insurance industry wanted assurance that SVR providers were reputable and capable. The SVR subcommittee set up performance based criteria. "The controversial aspects of the criteria were that in order to qualify as a member a firm had to reach certain targets; it had to have been in operation for at least one year, have installed at least 3000 units, and have made 100 recoveries." (p.3)

This rule allegedly served as a *de facto* barrier to entry. While auto owners were free to install SVRs from non-approved providers, the insurance industry for the most part gave discounts on insurance premiums for having SVR systems only to those car owners using VESA approved systems. New entrants were unable to meet the criteria for operation, since they would have neither a significant number of covered cars nor a significant number of recoveries.

The complainant, Tracetec, was rejected for SVR membership of VESA in 2001. In response to concerns that its performance standards were anti-competitive, "VESA eventually in August 2003 adopted an alternative for aspirant members who could not meet the performance criteria – they could now lodge a R2 million financial guarantee in lieu of meeting the performance standards." (p.5) Tracetex lodged a complaint with the Competition Commission in February 2004. In May 2004 three leading SVR members of VESA resigned and insurers changed their approach so that VESA approval was no longer a necessity for reductions in car insurance premiums. The Competition Commission considered that, with the financial guarantee system in place, the SVR standards after August 2003 were not exclusionary.

The Tribunal concluded that "The three SVR respondents, whilst not the only members of the committee, agreed to that standard and the probabilities are that without their consent the standard could not have been set. We say that the probabilities favour such an interpretation because this brief history illustrates that until all three companies were on board, it was not possible to agree a standard, and the later history shows that when they could not agree to changes in the standards, the committee disintegrated. It also illustrates that the three firms were not willing to agree on any more diluted form of standard that might have been less exclusionary in its effect." (p. 19) The Tribunal determined that the standard was exclusionary from the time of its introduction in 1999 to the time of introduction of introducing the financial guarantee option in August 2003. (p. 80) Tracetec argued that even the financial guarantee option was exclusionary. This view was not endorsed by the Tribunal.

50. Reduction of variety can serve as one form of exclusion. An example of how quality standard can be manipulated to reduce output is described in Box 3 on the Navel and Valencia orange marketing committees.

Box 3. Navel and Valencia Oranges: Quality Adjustments with Effect of Reducing Output

The U.S. Agricultural Adjustment Act of 1933 and the Agricultural Marketing Act of 1937 permitted the majority of producers of an agricultural commodity to agree to form a marketing coalition that could determine, for all producers, the amount of product sold for different uses, rate of flow of the product onto the market and minimum quality standards for that product. The coalition could impose price posting and inspection programs for agricultural commodities. Producers who oversupplied could face substantial penalties. With the benefit of antitrust immunity, the Navel and Valencia orange producers formed cartels that governed the distribution of their oranges for fresh orange sales and processing sales, initially a joint cartel, and then after 1952, separate cartels for each kind of orange. The orange marketing orders allowed the administrative committees to set how much of the crop would be sold in the fresh form, the timing of shipments to the fresh domestic orange market, and the minimum size of oranges.

One of the administrative committees contends that the stability provided by the marketing order made fresh oranges "available to consumers at a cost which is free from the inefficiencies of non-orderly marketing." (Valencia

Orange Administrative Committee, Annual Report of Operations under Federal Marketing Order 22, at 2 (1978-79)) However, an analysis of the effect of marketing orders suggests the reverse. Normally, in seasons of optimal growing conditions, a higher percentage of fruit would be of a quality appropriate for consumers of fresh fruit. However, the practice of the administrative committees has been to reduce the percentage of the fruit that goes to the fresh market in good seasons below the percentage allowed in bad seasons, largely by pro-rata limits as well as through quality limits on the size of oranges. The effect of such limitations is to keep prices high. In fact, while "85-90 percent of Navels and 65-80 percent of Valencias are of sufficient quality to be marketed in fresh form, fewer than 70 percent of Navels and 45 percent of Valencias typically reached the fresh market between the 1960-61 and 1980-81 seasons." (Shepard (1986)) More fruit was directed to processing than quality would suggest. The consequence was higher prices for fresh fruit, due to the output reduction.

Standards that establish different grades of quality are less likely to create competitive harm than standards that establish a minimum size because the minimum size standards can be used to limit total output reaching the fresh market, while establishing a gradation mechanism between different sizes does not limit the output reaching the fresh market.

51. Competition authorities to not condemn all standards agreements that are exclusionary. An example of a permitted agreement is an agreement among manufacturers over minimum performance criteria of domestic washing machines. In the EU, nearly all producers and importers of domestic washing machines agreed to cease production or importation of the most energy inefficient machines. The official rationale of the agreement is to reduce energy consumption. Despite the agreement's harm to competition (and elimination for consumers of the option to purchase the cheapest washing machines) this restriction was permitted by a decision of the European Commission on the grounds that it would bring considerable benefits to consumers from the reduction of emissions from electricity production.[33]

52. With respect to professional certification, Shaked and Sutton (1981) show that, as a theoretical matter, professions are likely to choose quality levels that are too high and sizes that are too small. That is, a profession will only set the socially optimal quality level if it cares solely about consumer welfare and not professional income.

5.2 Promoting coordinated high prices

53. Professional associations in many countries have developed "ethical" rules that prohibit competitive bidding or solicitation of the customers of another professional. Such ethical rules are generally regarded as violations of competition law. For example, in National Society of Professional Engineers v. Unite States, the Supreme Court deemed illegal the "Code of Ethics" provisions that prohibited competitive bidding among professional engineers. The association claimed that competitive price pressures would have an adverse effect on quality, thereby reducing public safety.[34]

5.3 Picking a standard that would not maximise social welfare

54. At times, standards may be set that would both not be set by the market and which would not maximise social welfare. One explanation of such standard decisions is that they are simple mistakes perhaps based on imperfect information about market desires by the standard setters. Other explanations are based on individual incentives yielding adoption of a standard when a different one (or no new one) would have maximised social welfare.

33 Commission Decision 2000/475/EC of 24 January 1999 (CECED), OJ [2000] L187/47.

34 435 U.S. 679 (1978).

55. "Excess inertia" can arise when users do not know each others' preferences. In such cases, a standard might not be adopted even though its adoption would be in the interest of all users. This situation can arise in two types of cases, first when users employ an old technology and a new one becomes available. Even though all users would benefit from switching to a new technology, it may be that no individual will actually switch.[35] In the second case, consumers choose between adopting one of two incompatible technologies. With imperfect information, they may end up choosing one when they all would have preferred the other. But they cannot reverse their choices.[36]

56. Standard setting can also promote "inefficient bandwagons". In these cases, users move to a new technology even when they would have been better off with the pre-existing technology. This can occur when some users prefer the new technology while others prefer the older one. The new users will move to the new technology. Users preferring the older technology will choose to follow, despite potentially having higher preference for the pre-existing technology than for the new one.[37]

5.4 Picking a standard through deception or incomplete information: patent ambush

57. At times, standard setting processes are alleged to be used to pick winners by some form of deception or misinformation. By participating in the standard-setting process, a company can keep itself informed about how a standard is developing. The company can also take advantage of delays and flexibility in the patent examination system to optimise the timing and nature of changes to the scope of any pending patent claims it may have that are related to the standard. When carrying out a patent ambush strategy with pending patents, the company does not inform the SSO that it has patent applications which are relevant to the standard being developed. At the same time, the company may adapt the claims in those applications to fit the emerging standard. Furthermore, the company may influence the standard, making it resemble its pending claims more closely. The company might therefore be able to modify both the standard and its own pending patents so that they match as closely as possible.

58. If the company succeeds in its strategy, the SSO will promulgate a standard that is covered by the company's undisclosed pending patents, which the company will then push through the examination process until they are granted. In the meantime, other companies will implement the standard in their products and customers will buy them. Substantial sunk investments that rely on the standard will be made. When the ambusher is confident that enough resources have been sunk to make switching to another standard too costly, it will reveal its patents and pounce, threatening infringement lawsuits. It might demand very profitable licensing fees, or it might decide to block the implementation of the technology altogether.

59. Patent ambushes would not necessarily change the outcome of a standard and, excluding price and access terms, may yield standards that the market would choose for technical reasons.

60. To the extent that legal cases do not restrain patent ambushes, they can give participants in standard setting processes a perverse incentive to engage in patent ambushes. This incentive to ambush may be lower for vertically integrated companies engaged in repeated interactions over standard setting. Broad use of patent ambushes by SSO participants could change the nature of standard setting, likely

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35 A commonly cited example of this kind of path dependency is the QWERTY keyboard, allegedly designed to slow down manual typewriters to avoid key jams.

36 See Farrell and Saloner (1985).

37 See Farrell and Saloner (1985).

reducing the value and quality of standards.[38] A number of cases in which patent ambushes have been alleged are described below.[39]

5.4.1 The Rambus Cases

61. Both the European Commission and the U.S. Federal Trade Commission have taken action against Rambus, Inc. in recent years for an alleged patent ambush involving pending patents and standards for dynamic random access memory ("DRAM") chips.[40] The cases have now concluded.[41]

62. The Joint Electron Device Engineering Council (JEDEC) develops standards for computer memory. One of its goals is to avoid setting standards that will require payment of substantial patent royalties by those who manufacture products that comply with the standard. Thus, JEDEC's policies sought to avoid inclusion of patented technologies in standards unless the patent holder had agreed to charge fair, reasonable and non-discriminatory ("FRAND") licence fees.

63. Rambus, a developer and licensor of computer memory technology, was a member and participant in proceedings of the JEDEC subcommittee on DRAM chip standards for approximately four years in the early to mid-1990s. During that time, Rambus had pending patent applications with disclosures broad enough to cover technologies for the standards under consideration.

64. The FTC challenged Rambus's conduct under Section 5 of the FTC Act (prohibiting unfair or deceptive methods of competition) and Section 2 of the Sherman Act (prohibiting monopolisation). In support of its claims, the FTC alleged that Rambus did not disclose any of its patents or pending patent claims during its JEDEC membership, although it did disclose some patents in connection with its resignation from the JEDEC. The FTC alleged that when a Rambus representative was asked for information about any of its patents that could cover the proposed standards under consideration he evaded the question, providing only partial information. Furthermore, throughout Rambus's JEDEC membership, Rambus is alleged to have used the information that it gained regarding the standards under consideration to amend and refine its pending patent claims with the aim of making them correspond directly to the proposed standards.

65. It was undisputed that Rambus's patents ultimately allowed it to monopolise (with a market share of approximately 90 per cent) four markets for technologies that were elements of the standard developed for DRAM. But internal Rambus communications urged the company not to assert those patents "until ramp reached a point of no return."[42] That is essentially what Rambus did, eventually enforcing its patents with several infringement lawsuits against DRAM chip manufacturers and significant licensing fees.

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38 SSOs are often not well placed to sue privately for deception towards the body, as SSOs often have very limited financial means.

39 This list is not exhaustive.

40 EC, *Commission Confirms Sending a Statement of Objections to Rambus*, Press Release (23 August 2007), available at http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/330&form; *In the Matter of Rambus, Inc.*, FTC Docket No. 9302, Opinion of the Commission (August 2, 2006); *Rambus Inc.*, 2007 WL 431524 (F.T.C. 2007); *Rambus, Inc.*, 2007 WL 431525 (F.T.C. 2007); *Rambus, Inc.*, 2007 WL 2086203 (F.T.C. 2007); *Rambus, Inc.*, 2007 WL 431523 (F.T.C. 2007); *Rambus, Inc. v. FTC*, 522 F.3d 456 (D.C. Cir. 2008).

41 The US FTC ultimately dismissed its case. U.S. FTC, *Statement in the Matter of Rambus*, Press Release (14 May 2009), available at www.ftc.gov/opa/2009/05/rambus.shtm.

42 *In the Matter of Rambus, Inc.*, FTC Docket No. 9302, Opinion of the Commission (2 August 2006), at 44-48.

66. The significance of Rambus's conduct under the antitrust laws has been intensely disputed. The main issues in the litigation have been i) whether Rambus had an obligation to disclose its granted and pending patents; ii) whether its failure to disclose them enabled it to obtain a monopoly in the four technology markets or whether that monopoly was instead the inevitable result of its superior technology; and iii) whether its failure to disclose merely deprived the JEDEC of an opportunity to obtain a commitment, in advance of establishing its standards, from Rambus that it would charge FRAND licence fees.

67. In July 2007, the European Commission sent a Statement of Objections to Rambus based on the same conduct that led to the FTC's case. The SO outlines the Commission's preliminary view that Rambus abused a dominant position by claiming unreasonable royalties on certain DRAM patents subsequent to a patent ambush. The official press release states that this is the first time the EU dealt with a patent ambush under EC antitrust law.[43] In December 2009, the European Commission accepted binding commitments from Rambus to lower its royalty rates over certain patents for a five-year period, with royalty rates of zero for the standards developed while Rambus was a JEDEC member and royalty rates of 1.5% for later JEDEC standards compared to a pre-commitment rate of about 3.5%.

5.4.2 ETSI

68. In 2005 the European Commission conducted an investigation of the European Telecom Standards Institute (ETSI), raising concerns that flaws in ETSI's standard setting procedures made the standards susceptible to patent ambushes. The EC closed the investigation after ETSI incorporated rule changes that were recommended by the Commission, making ETSI's procedures more resistant to patent ambushes. The changes included obligations relating to early disclosure of IPRs that are essential for implementing the standard, fair and transparent procedures for standard-setting, and FRAND conditions for licensing.[44] [45] At the time, ETSI also announced that it was considering further changes to potentially introduce negotiations over *ex ante* licensing agreements.

69. The current "ETSI Guide on Intellectual Property Rights" further states that "Specific licensing terms and negotiations are commercial issues between the companies and shall not be addressed within ETSI. Technical Bodies are not the appropriate place to discuss IPR Issues. Technical Bodies do not have the competence to deal with commercial issues. Members attending ETSI Technical Bodies are often technical experts who do not have legal or business responsibilities with regard to licensing issues. Discussion on licensing issues among competitors in a standards making process can significantly

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43 EC, *Commission Confirms Sending a Statement of Objections to Rambus*, Press Release (23 August 2007), available at http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/07/330.

44 EC, *Commission Welcomes Changes in ETSI IPR Rules to Prevent 'Patent Ambush*,' Press Release IP/05/1565 (12 December 2005), available at http://europa.eu/rapid/pressReleasesAction.do?reference=IP/05/1565.

45 Clause 4.1 of the "ETSI IPR Guidelines" states: "Subject to Clause 4.2 below, each MEMBER shall use its reasonable endeavours, in particular during the development of a STANDARD or TECHNICAL SPECIFICATION where it participates, to inform ETSI of ESSENTIAL IPRs in a timely fashion." To make this rule operational, ETSI adopts procedures such as guidelines to a chair that a "short reminder call for IPR disclosures should be made: on formal submission of a technical solution; on completion of the first stable draft of the standard; on working group approval of a draft standard; on TB approval of a draft standard.

E.g., this may consist of the following sentence '*May I remind Members of their obligations to use reasonable endeavours to disclose any Essential IPR [related to this issue] in a timely fashion*'." 17 May 2010 available at http://www.etsi.org/WebSite/document/Legal/ETSI_Guide_on_IPRs.pdf.

complicate, delay or derail this process." This suggests that ETSI would not perform *ex ante* licensing but would instead leave that for bilateral negotiation.

5.4.3 Unocal

70. Patent ambushes are not restricted to private SSOs, but can also occur when governments set standards. An example is the alleged patent ambush by Unocal, a gasoline refiner, in the California government's determination of new clean air regulations. In 1988, the California legislature authorised the California Air Resources Board ("CARB") to adopt and implement, among other measures, "motor vehicle fuel specifications for the control of air contaminants and sources of air pollution"[46].

71. CARB set about to fully define reformulated gasoline (RFG). The California legislature directed CARB to consult with the industry in the development of the Phase 2 regulations.[47] While the phase 2 RFG regulations were under development, Unocal and 13 of the other largest domestic oil companies and the three big domestic automobile manufacturers created the Auto/Oil joint venture ("Auto/Oil") to pool their individual research and to conduct joint research so that Auto/Oil could develop recommendations based upon publicly available data and technologies, with which various state governments can fairly and accurately compare the costs and benefits of the various alternatives to reduce emissions while avoiding expensive patented processes.[48] To achieve this goal, the Auto/Oil joint venture agreement required that all of the research conducted by Auto/Oil or donated to Auto/Oil through a presentation would be in the public domain and free for everyone to use.[49] On the other hand, this joint study agreement explicitly provided that each firm could pursue its own simultaneous, independent research and that no firm would be obliged to disclose the existence of this independent effort or share the results with the other members of the joint venture.[50]

72. Unocal conducted independent research and development activities that identified ways to change gasoline formulations to reduce the emissions of carbon monoxide, nitrogen oxide and unburned hydrocarbons. The research identified key variables for reducing emissions.[51]

73. Unocal presented its 5/14 research results to CARB and the industry group, and allegedly stated that these results were in the public domain and non-proprietary. Given this information, CARB adopted Phase 2 RFG regulations which are mainly based on Unocal's 5/14 research results. After the adoption of the regulations by CARB and following refinery modifications, Unocal revealed its patent on these results and intent to seek licence fees for the use of its patent.

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46 California Health & Safety Code , 43013 (a).

47 In 1990, CARB adopted Phase I reformulated gasoline ("RFG") regulations, establishing a modest set of standards governing certain gasoline properties. These regulations required only minimal compliance costs.

48 CCPF, p. 1439-43, 1455.

49 The stated purpose of the agreement was to conduct "joint" research, the results of which "will be disclosed to government agencies, the Congress and the public, and otherwise placed in the public domain." . To ensure that this result was effective, the agreement states, "No proprietary rights will be sought nor patent applications prosecuted on the basis of the work of the Program unless required for the purpose of ensuring that the results of the research by the Program will be freely available, without royalty, in the public domain. Complaint Counsel's Post Trial Belief, March 2005, p. 50-51.

50 Paragraph 6-B (p. 14-15) of the agreement, see the press release on Federal District Court jury's decision, November 3, 1997, p.7. available at http://sec.edgar-online.com/1997/11/04/14/0000716039-97-000054/Section2.asp.

51 One major finding was that the temperature at which 50% percentage of gasoline would evaporate (T50) was a key variable to reduce in order to cut emissions.

74. On 4 March 2003, U.S. FTC charged Unocal with anticompetitive conduct throughout the California Air Resources Board Phase 2 RFG rulemaking process (1990-1994). The Complaint alleges that Unocal violated Section 5 of the FTC Act while seeking and gaining its monopoly power in the supply of technology used to produce California gasoline. The Complaint alleges that, throughout the CARB Phase 2 RFG rulemaking process (1990-1994), Unocal brought "materially false and misleading" information to CARB and to industry groups "for the purpose of obtaining competitive advantage".[52] The FTC's Complaint argues that Unocal aimed to "lock in" the industry to produce Phase 2 RFG so that Unocal would obtain monopoly power in licensing nearly all gasoline formulations used by refiners to meet requirements of CARB's Phase 2 regulations. Thereafter, Unocal could allegedly gain excessive profits through collecting licencing fees for use of its patent.

75. On 25 November 2003, Administrative Law Judge D. Michael Chappell issued an Initial Decision concluding that the *Noerr-Pennington* state action doctrine[53] protects much of the conduct alleged to constitute unfair methods of competition and that the FTC lacks jurisdiction over the remaining allegations because they depend on resolution of substantial questions of patent law.

76. Complaint Counsel appealed ADJ's initial decision and on 7 July 2004, the Commission reversed and vacated the Initial Decision, because "Neither the *Noerr-Pennington* doctrine nor the claimed absence of FTC jurisdiction provides an adequate basis for Unocal's motions to dismiss".[54]

77. In August 2005, during the merger between Chevron and Unocal, Unocal stated that it would cease and desist from seeking to enforce its patents related to the CARB regulations.

78. This case illustrates that patent ambushes are not exclusively a concern for SSOs but can also be a concern for standards set by government. Government-established standards arising from a patent ambush potentially can be immunised by state actions against enforcement of antitrust laws.

5.5 Yielding asymmetric cost impacts

79. Standards can have different impacts on variable costs of production for firms. Giving some firms lower variable costs than others can substantially affect subsequent competition between products produced to a given standard. Asymmetric production cost impacts may be a natural result of much standard setting activity. Consequently, asymmetric production cost impacts are not presumed harmful. Moreover, asymmetric production costs are normal when there are multiple IP holders. This is because producing firms license the IP necessary to produce products via bilateral negotiation. These bilateral rights will involve lower payments (or potentially no payments at all) when each party to the contract is exchanging IP rights with each other. Firms without any IP rights to trade, in contrast, will pay a higher total licensing price. The lower cost for firms that have engaged in research to produce IP can be viewed as part of their return to research investment. Asymmetric licence costs should be viewed as normal in these situations.

80. Cost differences may not be "normal" in the same sense if aggravating factors are present, such as if a firm uses a patent ambush as a method to raise rivals costs.[55] In the Unocal case discussed above, after CARB's Phase 2 RFG regulations were put in force, Unocal sought licence fees for the use of its

52 Administrative Complaint, March 2004.

53 The state action doctrine makes actions by states immune from prosecution for competition law violations under certain conditions.

54 Order Reversing and Vacating the Initial Decision/ Commission's Opinion, July 2004.

55 See Salop and Scheffman (1983).

patented technology. Other refiners challenged Unocal's patent. Following the decision by California's district court (September 1998) finding that other refiners were infringing Unocal's patent, Unocal sought 5.75 cents per gallon over all gasoline production from 1996 to 2000, which used its patented technology (that was over 92% of all RFG complying with CARB's regulations). The high fees raised production costs of all refiners who supply Phase 2 RFG to consumers in California and ultimately were expected to raise prices for consumers.[56]

6. What actions can be taken to mitigate the harms?

81. Although competition harms may arise from standard setting, there are few simple solutions for addressing them.[57] A number of actions can be taken to mitigate the harms from anticompetitive consequences of certain standard setting actions. *Ex post* solutions that deal with the situation after the harm has been done from a patent ambush include competition law, patent review and SSO IP contract violation. Competition law solutions may be appropriate when there is patent ambush through standard setting, though courts have not been uniformly supportive of the use of competition law and other solutions, such as lawsuits based on contract law, may be preferable. Weiser (2008) suggests that "effectively focused antitrust oversight – as was the case in Rambus – can bolster the effectiveness of private standards bodies that might otherwise be less vigilant in ferreting out abusive conduct."[58] For the moment, competition law experience is limited, much of it having been discussed earlier and contract law experience, based on obligations to disclose and license patents at reasonable and non-discriminatory rates, is also limited. Reviews and invalidations of granted patents may be appropriate where there are legitimate questions about the original grounds for the claim. [59]

82. Government officials have considered not only *ex post* solutions but also *ex ante* mitigations. *Ex ante* mitigations often suggested include:

- Use of international standards;
- Governance of SSOs;
- SSO disclosure rules;
- *Ex ante* negotiations over price and other terms; and

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56 Unocal's economic expert claimed that "...90% of the additional costs associated with complying with any royalty license from Unocal would be reflected in wholesale gasoline prices."

57 Solutions can apply to multiple areas of potential harm. To avoid repetition, then, they are listed in a different section of this note.

58 In contrast, Lemley (2002) argues for enforcement of SSO IP rules but that "Antitrust law should be extremely reluctant to interfere with this process to avoid chilling the creation of private liability rules in the patent system. He further suggests creating a safe harbour for SSOs to agree on intellectual property rules "even if they take an active role in determining what a reasonable and non-discriminatory royalty should be, so long as they apply a fair process set *ex ante*." Kobayashi and Wright (2009) argue that patent holdup cases are best argued under patent laws and contract law. While this argument may be reasonable, it is not clear that courts are any more amenable to resolving patent ambush cases via patent and contract law than via antitrust law. See the Unocal case for an example in which a private attempt to deal with an alleged patent ambush fails.

59 Lemley (2002) argues that the sectors where patents are "most likely to overlap and to block the development of necessary improvements" are the telecommunications, computer and Internet industries. He suggests, "SSO IP rules are thus a partial market solution to a problem created by overbroad intellectual property protection."

- Fair, reasonable and non-discriminatory pricing.

83. Simple rules will have difficulty mitigating harms in the complicated world of standard setting, across so many different types of products and with firms and consumers of various degrees of sophistications. To the extent that simple rules are promoted by government, it is important to consider the unintended consequences that can arise from intervention. One key point with respect to patent ambushes is that private firms participating in a SSO bear the direct financial risk of a patent ambush and thus have a direct, individual incentive to restrict patent ambushes.

84. The most commonly proposed *ex ante* rules are discussed below.

6.1 Use of international standards

85. In some countries, standards may be set for goods at a national level that are different from commonly accepted international standards. The World Trade Organisation (WTO) has a Technical Barriers to Trade (TBT) agreement that seeks, as an underlying principle, to avoid unnecessary obstacles to trade. The Agreement encourages Members to use existing international standards for their national regulations, or for parts of them, unless "their use would be ineffective or inappropriate" to fulfil a given policy objective. This may be the case, for example, "because of fundamental climatic and geographical factors or fundamental technological problems" (Article 2.4).[60] The TBT agreement focuses particularly on technical regulations – for which compliance is mandatory, in the sense that the product is not allowed to be sold without complying with the technical regulation.

86. "The TBT Agreement takes into account the existence of legitimate divergences of taste, income, geographical and other factors between countries. For these reasons, the Agreement accords to Members a high degree of flexibility in the preparation, adoption and application of their national technical regulations. The Preamble to the Agreement states that 'no country should be prevented from taking measures necessary to ensure the quality of its exports, or for the protection of human, animal, and plant life or health, of the environment, or for the prevention of deceptive practices, at the levels it considers appropriate'. However, Members' regulatory flexibility is limited by the requirement that technical regulations 'are not prepared, adopted or applied with a view to, or with the effect of, creating unnecessary obstacles to trade'. (Article 2.2)."[61]

87. For many years, technical experts have worked towards the international harmonization of standards. An important role in these efforts is played by the International Standardization Organization (ISO), the International Electrotechnical Commission (IEC) and the International Telecommunication Union (ITU). Their activities have had major impact on trade, especially in industrial products. For example, ISO has developed more than 9,600 international standards covering almost all technical fields.

88. Technical harmonization may increase consumer welfare. Within a harmonized regulatory environment, competition ensures that consumers have a wide and economically attractive choice of products. This presupposes, however, that harmonized standards do not go beyond fulfilling their

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60 The TBT Agreement states: "Where technical regulations are required and relevant international standards exist or their completion is imminent, Members shall use them, or the relevant parts of them, as a basis for their technical regulations except when such international standards or relevant parts would be an ineffective or inappropriate means for the fulfillment of the legitimate objectives pursued, for instance because of fundamental climatic or geographical factors or fundamental technological problems."

61 See WTO.

legitimate regulatory objective, i.e. that they do not stifle innovation or otherwise discourage producers from introducing new products or product variants.

6.2 Governance

89. The way that SSOs are governed and operated can substantially mitigate many competition policy risks.

6.2.1 Representing diverging economic interests

90. One way to promote results aimed at delivering products that are best for end consumers is for SSOs to include end consumers among the participants and voters. Some medical profession licensing boards have attendees who represent the legal service of the government. Others mandate that some members shall not be from the licensed profession, as with Ireland's Medical Council that reserves at least three out of 25 seats for non-physicians who are explicitly requested to protect the public interest. The Institute of Medicine, an independent scientific advisor to the U.S. government, recommended that, in response to the presumed lack of independence of medical professions, "[l]icensing boards should draw at least half of their membership from outside the licensed occupation; members should be drawn from the public as well as from a variety of areas of expertise such as health administration, economics, consumer affairs, education, and health services research." (IOM (1989)) Encouraging wide participation in standard setting helps to increase the voice of potentially excluded firms and technologies. This can potentially reduce anticompetitive exclusion.

91. Consumer representation on SSOs or licensing boards is not a panacea. In general, consumers have a small economic interest in the outcome of licensing compared to any member. For many standards, an approved consumer's body would not exist. Consumer representative bodies do not always have a clear and compelling link to real consumers, so may not be perfect representatives of consumers. Finally, consumer representatives may not grasp the implications of complex technical choices that are made during standard setting and may not be able to make good technical judgments about tradeoffs between different technologies that can be included in a standard.

6.2.2 Ensuring that SSOs avoid acting as cartels

92. In order to reduce the likelihood of SSOs acting as a cartel or price co-ordination body, many SSOs implement policies that do not permit discussion of price during the standard setting process. Rules may take particular care to ensure that producers of substitutes do not joint set prices, whether for IP in the SSO stage or as end-producers.

6.3 Standard-setting body disclosure rules

93. Standard setting bodies have a variety of approaches for disclosure of potential intellectual property claims and potential royalty rates and licensing terms in settings prior to the adoption of a standard. These rules have sometimes been proposed a method to reduce ability to carry out a patent ambush.

94. Two main types of disclosures can be required or encouraged. First, SSOs may create rules that impose obligations on their members to make accurate disclosures of any patents and pending patents they have that could overlap with the standard under development. The disclosures have to be made before and during the standard setting process.[62] Second, SSOs can oblige their members to disclose the maximum

[62] Disclosure rules presume that companies are aware of all relevant patents they may hold. For large companies, a representative may not be aware of all relevant patents. Moreover, the most complete

fees and most restrictive licensing terms they would demand for such patents if the technology they cover were to become part of the standard. Under a proposed policy of a developer of computer device interconnection standards, VITA members will be requires to make early disclosures of patents and obliged to declare maximum royalty rates and most restrictive non-price licensing terms that would be required of a licensee. A business review letter found benefits from such a scheme because "each working group member also will be able to compare the most restrictive licensing terms associated with each alternative technology, including freely-available public domain technologies, when deciding which technology to support for inclusion in the draft VSO specification. Disclosure of this information, enforced by the requirement that non-disclosed patents be licensed royalty-free, permits the working group members to make more informed decisions when setting a standard." [63] Former Commissioner Kroes endorsed both of these approaches as a way for SSOs to avoid "being manipulated by narrow commercial interests."[64]

95. A variation on those policies is to give members the option to commit to making such disclosures, rather than making the commitments mandatory. A business review letter to IEEE considers a policy that would give members of the SSO the option to publicly disclose and commit to the most restrictive terms (including royalty rate) that they would require for patent claims deemed essential for the standard. [65] If there is any *ex ante* competition, though, the effect could be the same. A company would probably raise the SSO's suspicions and put itself at a competitive disadvantage if it refused to undertake such a commitment when its rivals did commit themselves. Not only might the SSO be more likely to choose the rival's technology, but there would also be a risk that the SSO might limit the company's ability to continue participating in the standards' development process.

96. Either version of these disclosure policies will improve an SSO's ability to compare the technical and financial merits of the technologies covered by granted or pending patents with each other and with any IPR-free alternatives *before* committing to a particular formulation of a standard.[66] That, in turn, could enable the SSO to take advantage of any *ex ante* competition between technologies that exists, instead of exposing itself to being held up after the standard is chosen and it is too late to switch to another technology.

97. If an IP owner announces a high "*supra*-competitive" royalty rate even before a formal decision is made to incorporate its IP into the standard, but the IP is nonetheless included, there would not be a competition policy concern. In other words, if the required disclosures are made and they do not cause the SSO to avoid putting a certain patented (or patent pending) technology into its standard, then there should not be a presumption that it is anticompetitive for the IP owner to charge a *supra*-competitive licensing fee for that technology. Under those circumstances, the IP owner simply has the best technology when both its

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searches for patents related to a standard are often performed at the end of the standards process, to avoid multiple and expensive searches of potentially broad portfolios.

63 See Letter from Thomas 0. Bamett, Assistant Attorney Gen., U.S. Dep't of Justice, to Robert A. Skitol, Esq., Drinker, Biddle & Reath, LLP re VMEbus International Trade Association (VITA), Oct. 30, 2006, available at http://www.usdoj.gov/atr/public/busreview/129380.pdf.

64 Neelie Kroes, European Commissioner for Competition Policy, *Being Open about Standards*, Speech 08/317 before OpenForum Europe (10 June 2008), p.4.

65 See Letter from Thomas O. Barnett, Assistant Attorney Gen., U.S. Dep't of Justice to Michael Lindsay, Esq., Dosey and Whitney, LLP re IEEE, 30 April 2007 *available at* http://www.justice.gov/atr/public/busreview/222978.pdf .

66 But see Thomas Cotter, "Reflections on the Antitrust Modernisation Commission's Report and Recommendations Relating to the Antitrust/IP Interface", *53 Antitrust Bulletin 745, 762 n.50* (noting possibility that SSO members might disclose too many granted or pending patents, leading to unnecessary delays in the standard setting process as the SSO wades through irrelevant disclosures).

price and quality are taken into account – or maybe it has the only feasible technology. The competition policy objective should not be to force low or "reasonable" licensing fees, but rather to prevent IP owners from receiving more by using an ambush strategy than they would have received if they had not used that strategy.

98. Making firms responsible for revealing relevant IP can have unintended consequences. In particular, such rules may increase the rewards to a firm with essential technology from staying out of the standard-setting process. Once the standard is adopted, a patent may still be unveiled with high licensing feeds, but such actions would involve no deceit nor any promise of fair and reasonable licensing fees.

99. If firms are required to announce a maximum licence fee for all their IP in advance of a standard's finalisation, the risk is increased that a standard setting forum will turn into a forum for illegal price setting.

100. Strategic actions by firms may distort the standard setting processes. When firms know that their announced maximum licensing fees will serve as the basis for later bilateral negotiations with other firms over access to the other firms' IP, it is reasonable to expect that maximum fees will be inflated well above expected fees. Firms expecting a modest fee or none at all may choose to announce high fees as a bargaining strategy. Ultimately, the aggregate announced fees as a percentage of product sales revenue could amount to more than 100%.

6.4 Ex ante negotiations

101. Another anti-ambush strategy that has been proposed builds on the disclosure requirements and calls for joint *ex ante* negotiations between all the SSO members who are prospective licensees of a technology and the member who is a prospective licensor of that technology over the royalties that the latter would charge if the technology were to be incorporated in the SSO's standard.

102. As with rules requiring the disclosure of maximum fees, part of the purpose of holding joint *ex ante* negotiations is to get potential licensors to set their royalty rates before the standard is selected, *i.e.*, while the licensors still face some competitive pressure (assuming the SSO has a realistic option of choosing an alternative technology). The other component of this strategy aims to create some countervailing buyer power by combining the demand generated by all the potential licensees in the SSO. Together, the *ex ante* effect and the joint negotiation/monopsony effect can help the SSO members who will implement the standard to procure more reasonable terms from owners of essential IP, leading to lower marginal costs and possibly to lower consumer prices. It might also result in a speedier standard setting process and a reduced likelihood that litigation will be necessary to resolve disputes about licensing fees and terms.

103. On the other hand, economic theory suggests that countervailing buyer power leads to an indeterminate outcome when pitted against monopoly power. Output and consumer welfare could both decline even further than they would in a pure monopoly scenario. Furthermore, it will not necessarily always be the case that the licensor has monopoly power, especially before the standard is set. The buyer power therefore might not be countervailing against monopoly power but rather it might just push fees that are already competitive even lower. That could force royalty rates down so much that the leading innovators would respond by reducing their investments in R&D. Several commentators have dismissed the idea that buyer power in SSO settings would lead to output reductions, though.[67]

[67] See *e.g.* Joseph Farrell, *et al.* (2007) p. 632; Ohana *et al*. (2003).

104. The antitrust risk from *ex ante* negotiations over prices may be larger than for simple price announcements, given that many participants to an SSO are potential competitors.[68] If firms agree to create a high marginal cost for themselves through licensing, but will receive much of the higher cost back in IP payments, they may be able to achieve price impacts like those of a cartel. Competition authorities should take great care when encouraging pricing conversations among a group of competitors.[69]

105. Aggregate limits for all licensing fees have also been suggested as a possible solution. But determination of an appropriate licensing fee is difficult. It would not be appropriate to have the same percentage fee for all products, as some will have higher intellectual property dependence than others. But determining the appropriate aggregate rate for any particular standard would then be an individual inquiry with no clear means of developing a fair aggregate fee or of allocating that fee among multiple suppliers of IP for the standard.

106. Group licensing such as cross-licensing or patent pool formation can reduce the incentive to charge high royalties for IP licensors. "[C]oordinating such licensing can lead to lower royalty rates than would independent pricing of the patents." The intuition is that "[l]ower prices for one component generative a positive external effect on the owner of the other component. These externalities are internalized through integration, leading to lower prices."[70] [71]

107. In appropriate circumstances, competition authorities have viewed such *ex ante* negotiations as worthwhile. For example, the business review letter for the UHF RFID standard does not oppose a "proposed joint patent-licensing arrangement, pursuant to which the Consortium will license its members" patents that are "essential" to manufacture products in compliance with certain ultra high frequency identification standards, and distribute royalty income among" the licensors. The letter finds efficiencies from the proposal, including that "overall royalty rates may be lowered by limiting the threat of hold up and royalty stacking, and transaction costs will be lower. It finds safeguards against potential anticompetitive effects, such as valid patents, exclusion of substitute patents from the pool, limited ability to restrict downstream competition and narrowly tailored grantback clauses to ensure an ongoing incentive to produce follow-on innovations.[72]

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68 Sidak (2009) suggests that insufficient attention is being given to the risk of oligopsonistic collusion in SSOs if they are allowed to discuss royalty terms in an effort to avoid "hold up".

69 At the moment, for standards containing multiple firms' IP, price negotiations for royalties tend to be bilaterial.

70 See Shapiro (2000).

71 Antitrust review of pooled patents has a long history. Perhaps the first such review occurred in September 1917 when the U.S. Attorney General issued an antitrust advisory opinion on the pool of patents for producing airplanes. The Wright-Martin Aircraft Corp. was demanding 1,000 USD per plane, considered a "high" fee and amount to about 5% of an airplane's cost. The Wright-Martin patents were pooled with those of the Curtiss Aeroplane & Motor Corp. The pool held various basic patents, including the "Heavier Than Air Flying Machines" patent. The pool split royalties of 200 USD per plane between Wright-Martin (67.5%) and Curtiss (20%) with the remaining fees reserved for pool administration. The pool had a lower aggregate fee than would exist absent the pool, though the threat of government exercise of eminent domain may have brought them to the table. The antitrust review found that there were no anticompetitive effects from assembling these patents into a single package. (See Klein (1997))

72 See Letter from Thomas O. Barnett, Assistant Attorney Gen., U.S. Dep't of Justice to William F. Dolan and Geoffrey Oliver, Jones Day, re RFID Consortium, 21 October 2008 available at: http://www.justice.gov/atr/public/busreview/238429.htm.

6.5 FRAND

108. One widespread SSO strategy for ensuring IP rights do not result in excessive IP licensing fees requires members to make an *ex ante* commitment that if any technologies on which they hold patents or pending patents are included in the SSO's standard, they will license those technologies on "FRAND" or "RAND" terms. FRAND means "fair, reasonable, and non-discriminatory."[73] FRAND commitments are typically worded in a broad fashion and do not specify actual licence terms. FRAND commitments have the potential to reduce gains from patent ambush.

109. The "non-discriminatory" component of FRAND is generally deemed to be useful. Although FRAND does not necessarily require that all licensees receive identical licence terms, it does give similarly situated licensees some reassurance that they will be treated alike by the licensor. It can also prevent the licensor from potentially harming competition by charging higher royalties to its horizontal competitors than it does to everyone else.[74]

110. On the other hand, the "fair" and "reasonable" part of FRAND has been controversial. Proponents argue that FRAND license obligations provide some reassurance that would-be ambushers will not be able to hold up the standard by refusing to license their patents or by offering a licence only on unreasonable terms. Others find that expectation to be naïve. While FRAND commitments may prevent licensors from threatening outright refusals to deal since they require the patent owner to license its patents (at some price), they offer little or no protection against "gouging".

111. The root of the problem with "fair" and "reasonable" is that those terms are not tied to an objective principle or definition. Instead, they are imprecise and can be conceptualised in different ways. Therefore, a firm with a patent that is essential to a standard could, in principle, fulfil its FRAND obligation to offer a licence but do so at an asking price that no potential licensees consider reasonable. Without something to anchor the argument besides the words "fair" and "reasonable" themselves, however, it is not clear how FRAND can help to settle the parties' differences.

112. A court might be called upon to decide what "fair" and "reasonable" mean in the context of a particular dispute. Different courts would likely have different interpretations for the same case about what "fair" and "reasonable" mean. Therefore, FRAND offers little or no predictability to either licensors or licensees. "[T]he expression 'FRAND terms' is so indeterminate as to be devoid of any meaning in practice."[75] On the other hand, it can be argued that FRAND is the best feasible regime for governing IP licensing.[76]

6.6 Conclusion on mitigation of potential harms

113. Mitigation strategies for the harms that can arise from standard setting are complex and not foolproof. Adopting international standards and ensuring open participation in governance can reduce risks of harm. SSOs generally actively discourage activities that could be conceived of as anti-competitive co-operation by competitors. It is important nonetheless to avoid competition law threats that may chill actions such as sharing of price information to determine costs of adopting one technology as opposed to another.

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73 RAND simply omits the word "fair." For convenience's sake, only the term "FRAND" is used here.

74 See Masoudi (2007), p. 6.

75 See Ohana, Hansen, and Shah (2003) or Lemley (2002) ("without some idea of what [FRAND] terms are, reasonable and non-discriminatory licensing loses much of its meaning").

76 See, e.g, Geradin and Rato (2007).

114. SSOs have a private incentive to limit patent ambush, so it is unclear that government promotion of mitigation strategies is essential in addition to the private incentives. In order to achieve the valuable positive benefits of standard setting, governments may need to accept that governmentally imposed *ex ante* measures will not always be successful in eliminating harms. Given that *ex ante* measures can be costly, have unintended consequences and at times provide no clear guidance, there is a legitimate question about the role of government in preventing patent ambushes, apart from ensuring a clear path for *ex post* threat of litigation and encouraging enforceable contracts about IP by SSOs.

115. The international nature of law enforcement and government advocacy in this area is of particular importance. "Unlike some aspects of antitrust oversight (say, the essential facilities doctrine), different jurisdictions cannot adopt different approaches on standard setting body IPR licensing policies without creating considerable confusion and undermining the globalised nature of the information technology marketplace."[77] Governments should take account of the international nature of standard-setting process when considering national initiatives.

7. Conformity assessment

116. Once standards are set, how can consumers be sure they are followed? For many products and services, the answer is through a guarantee of conformity. To provide a guarantee of conformity, two main approaches exist. These are conformity assessment (often by an independent conformity assessment body) or self-certification of conformity through a supplier's declaration of conformity (SDOC).

117. Certification bodies that deliver independent certificates of conformity are typically private but often are authorised by government or SSOs. "Conformity assessment procedures are technical procedures — such as testing, verification, inspection and certification — which confirm that products fulfill the requirements laid down in regulations and standards." (WTO) When conformity assessment works, no firm will be able to claim a product meets a standard when, in fact, it does not.

118. When governments requires independent conformity assessment bodies to provide certificate of conformity prior to sale of a product or service in a given geographic area, international firms producing a product experience supplemental and duplicative conformity assessment costs (for duplicating work already performed by one conformity assessment body), extra costs for initial product samples (which are prepared prior to mass production and thus potentially very expensive); and lost business opportunities during the delays during which conformity assessment is underway and products cannot be launched in a country. For short lifecycle products, these delays can be particularly costly. A final critique is that conformity assessment requirements can be used illegally to acquire proprietary technology. For large companies with many products, the direct and indirect costs of certificates of conformity can be large.

119. SDOC gives manufacturers an ability to declare their product in conformity with a standard without having a formal certificate of conformity assessment. Such procedures are most likely to be permitted for products in which there are minimal health and safety ramifications from non-conformity. SDOC reduces the costs of conformity assessment. Many governments appear unwilling to accept SDOC perhaps through worries that SDOC disclosures are not independent and are subject to falsification. The primary protection to consumers against false SDOC is that manufacturers are open to litigation risk in case of false disclosures.

120. The best way to provide conformity guarantees is a subject of much debate. In a path-breaking effort, Europe has in the last 15 years adopted SDOC for many types of products and services. OECD research suggests that this adoption generally promoted more exports into the EU. Requiring independent

[77] See Weiser (2008), p. 3.

conformity assessment at a country level, as before the change to SDOC, may constitute a barrier to entry, particularly for foreign-based firms.[78]

7.1 Market structure

121. To better understand potential competition policy issues with conformity assessment, it is important to know more about how certificates are delivered. The number of conformity assessment bodies worldwide is large. The International Accreditation Forum has more than 5,000 members and the OECD has estimated that there are more than 10,000 organisations conducting conformity assessment.[79] Despite the large number of bodies performing conformity assessment, conformity assessment bodies may at times have market power as a result of public regulation or self-regulation. For a given standard, there is often only one body in a given jurisdiction authorised by the government or by the relevant SSO to provide conformity guarantees. Such bodies may have significant ability to influence the price and terms of conformity assessment. There are few reasons to limit the number of conformity assessors for a standard provided that the laboratories have shown a capability to test and evaluate goods and services, maintains control over the certification of products (even when certain testing is performed by subcontractors), is independent in its decision-making and produces reasonable and documented findings. Some governments allow multiple bodies to apply for conformity assessment credentials, including foreign bodies.[80] To the extent that excessive restrictions exist on which bodies can perform conformity assessment, those restrictions merit review.

7.2 TBT agreement

122. The concerns about competition policy in conformity assessment are not just hypothetical. According to the WTO, "Non-transparent and discriminatory conformity assessment procedures can become effective protectionist tools." Conformity assessment is covered by the WTO Technical Barriers to Trade (TBT) agreement. The TBT Agreement aims to support the goal of "*One product, one test, accepted everywhere"*. (OECD, WP37) An unnecessary obstacle to trade could result from stricter or more time-consuming procedures than are necessary to assess that a product complies with the domestic laws and regulations of the importing country. For instance, information requirements should be no greater than needed, and the siting of facilities to carry out conformity assessment, and the selection of samples should not create unnecessary inconvenience to the agents" (Articles 5.2.3 and 5.2.6). (See http://www.wto.org/english/tratop_e/tbt_e/tbt_info_e.htm)

123. "According to the TBT agreement, procedures for conformity assessment shall be applied to products imported from other WTO Members "in a manner no less favourable then that accorded to like products of national origin and to like products originating in any other country" (Article 5.1.1). This means that imported products must be treated equally with respect to any fees charged to assess their conformity with regulations. Similarly, Members must respect the confidentiality of information about the results of conformity assessment procedures for imported products in the same way as for domestic products so that commercial interests are protected (Articles 5.2.4 and 5.2.5)." See http://www.wto.org/english/tratop_e/tbt_e/tbt_info_e.htm

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78 See OECD Trade Policy Working Paper Number 78. Available at: http://www.oecd.org/dataoecd/57/3/41481368.pdf

79 See OECD Trade Policy Working Paper Number 37. Available at: http://www.olis.oecd.org/olis/2006doc.nsf/LinkTo/NT00003B06/$FILE/JT03212596.PDF

80 One example of allowing multiple and foreign laboratories is the U.S. Occupational Safety and Health Administration (OSHA) Nationally Recognized Testing Laboratory (NRTL) designation. There are more than 10 NRTLs, at least two of which are foreign based (one in Canada, one in Germany).

124. Duplicative testing is a socially wasteful cost without proven social benefits. "Demonstrating compliance with technical regulations may impede international trade. In particular, if products are to be exported to multiple markets, multiple testing may be required. Manufacturers can have difficulties in securing approval for their products on foreign markets, for instance because testing experts disagree on optimal testing procedures, from bureaucratic inertia or even from manipulation of the testing process by protectionist groups. Whatever the reason might be, such diversity of procedures and methods significantly increases the costs of producers who sell in multiple markets."

7.3 Harmonisation of conformity assessment

125. Harmonisation of standards is beneficial in part because conformity assessment is cheaper for harmonised standards. For example:

> *Construction products can be placed on the market only if they conform to the European Council's Construction Products Directive (i.e. by applying harmonized European standards), for instance by obtaining a "European Technical Approval" (ETA). ETAs, however, are only awarded for one product and one manufacturer at a time, which means additional expenses in the range of DM 5,000 to DM 30,000 (where harmonized standards exist), and DM 10,000 to DM 70,000 (where there are no harmonized standards). It is therefore evident that manufacturers of construction products for which no harmonized standards exist face considerably higher costs before approval. (DIN (2000), p. 32)*

126. Harmonisation of conformity assessment will take the savings on conformity assessment one step further, by eliminating duplicative costs, ensuring, e.g., mutual recognition of conformity assessments from different certification bodies. Mutual recognition agreements (MRAs) for test reports and certification is discussed as a solution to duplicative testing costs and limited domestic competition to assess conformity, but real progress in achieving mutual recognition is slow. Reasons for this include that government acceptance of the principle of MRAs is limited, certification bodies would likely not seek full MRA because this would reduce their aggregate revenues, and certification is increasingly required by non-traditional demanders.

127. Article 6.3 of the TBT Agreement strongly encourages WTO Members to enter into negotiations with other Members for the mutual acceptance of conformity assessment results. The presence of a high degree of confidence in testing and certification bodies is, in fact, a prerequisite for the good functioning of an MRA. For this reason, Article 6.1 of the TBT Agreement recognises that prior consultations may be necessary to arrive at a mutually satisfactory understanding regarding the competence of the conformity assessment bodies. It also points out that compliance by conformity assessment bodies with relevant guides or recommendations issued by international standardising bodies can be regarded as an indication of adequate technical competence.

128. Many governments are reluctant to support mutual recognition. They may fear a loss of control over safety standards and disadvantage for their domestic certification bodies compared to foreign ones that may win more business in case of mutual recognition. Even when mutual recognition is agreed between technical bodies, governments may not support it. One example is "the International Laboratory Accreditation Cooperation (ILAC) agreement, whose signing ceremony some years ago was attended by government representatives from some of the major countries involved, such as the EU and the United States; but when the question was asked "*will those governments recognise, as a basis for certification, a test report issued outside their own country under the ILAC agreement?*" the position taken by some

governments was that regulatory recognition could only be granted if the CABs in question complied with the separate, regulatory procedures.[81,82]

129. Certification bodies would, in aggregate, lose revenue from MRA, because only one certification body would do the substantive testing work that, at the moment, is peformed repeatedly across multiple jurisdictions. If an MRA is put into force, that would be an additional effect of increasing price competition across certification bodies, as firms would shop for the certification body that would offer the best terms.

130. Increasingly, the private sector, such as large stores, are requiring certification for various product categories. MRAs would consequently develop a new hurdle because in order for a manufacturer to sell to a retailer, it would not only need government support for MRAs, but also the retailer's support.

131. The absence of harmonisation and mutual recognition of conformity assessment or non-recognition of self-certifications can result in duplicative costs of conformity assessment, raise other costs, at times slow entry by foreign firms and, if information gained through national conformity assessment is appropriated, result in taking of proprietary company information. Restrictions over domestic provision of certification may result in higher prices than would exist with active competition.

8. Conclusion

132. In conclusion, this paper has provided guidance on the complexities of competition policy with respect to standard setting. In case governments take action, it is important to recall that standards, particularly in high technology, can become actual or de facto international standards. As a result, application of competition policy in one jurisdiction can at times have extra-territorial implications. Ensuring that inconsistent rules do not develop in different parts of the world is therefore particularly important.

133. A number of points emerge from the practices and policies considered in this paper:

- The standard setting process, taking into account all different types of standards, is extraordinarily complex.

- The benefits of allowing firms to jointly discuss standards with each other, or potentially in conjunction with the government, are substantial. For example, standards help to integrate complementary intellectual property with separate owners. Policy makers should begin with the rebuttable presumption that standard setting is a legitimate activity that yields substantial economic benefits.

- There are clear and known risks of illegal coordination or undue restrictions on competition from standard setting processes. Longstanding examples would include price setting and market allocation among competitors.

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81 The EU, for example, requires its domestic CABs to enter into formal, direct sub-contracts with any foreign CAB (i.e., outside the EU) whose test reports it wishes to use as a basis for certification. Evidently, in trade between EU member states within the EU itself, that requirement does not apply, and direct recognition of home-country certificates is normally assured.

82 See OECD Trade Policy Working Paper 37. Available at: http://www.olis.oecd.org/olis/2006doc.nsf/LinkTo/NT00003B06/$FILE/JT03212596.PDF.

- A more recent example of risks occurs when standards are "ambushed" by a company that conceals relevant patents until a standard has been set and then sues for infringement. Patent ambushes are an activity with no redeeming social benefits. Competition agencies sometimes combat patent ambushes by allowing and advocating certain *ex ante* measures by SSOs, such as rules on disclosures, negotiations of licensing terms. Agencies may also take enforcement action against ambushers.

- Efforts to mitigate potential harms from standard setting may have unanticipated effects.

- Conformity assessment raises important and largely ignored competition policy issues. While designed to ensure that products meet a standard, conformity assessment policies merit review, especially when governments require duplicative assessments that are substantially equivalent or when governments or SSOs limit the number of assessors in a way that may restrict the number of suppliers of conformity assessments for a given standard and lead to high prices for certification.

- Governments can usefully:

  - Be cautious when considering instituting widespread obligations on the standard setting process, taking into account the international context of many standards;

  - Evaluate any decision to step into specific disputes in the standard setting arena; and

  - State any general principles for identifying and penalising illegal conduct in advance, taking into account that seeking the best technical standards is an activity that often benefits from joint action by potential competitors.

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