Maximizing the Contribution of IP Rights (IPRs) to SME Growth and Competitiveness

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ABSTRACT

This report investigates the current and potential role of intellectual property rights (IPR) to support the growth and competitiveness of small and medium sizes enterprises in ASEAN. The evidence from ASEAN and elsewhere shows that the process through which IPR contributes to SMEs is complex and needs to be understood in the context of business strategy and the ways technology is transferred and used by SMEs. One of the key lessons to emerge from international experiences is that national policies for promoting SME development are most successful when a number of development factors are aligned. While IPR is one of these factors, maximizing their contribution to the growth and development of SMEs in ASEAN requires matching the various components of IPR regimes to different levels and stages of firm development in different national economic contexts.

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ABREVIATIONS

AMCs	ASEAN Member Countries
APEC	Asia Pacific Economic Cooperation
IPRs	Intellectual Property Rights
MFN	most Favoured nation
REPSF	Regional Economic Policy Support Facility
SME	Small and Medium Sized Enterprises
TNC	Transnational Corporation
TRIPS	Trade Related Intellectual Property Rights

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The authors would like to thank the very many people from whom they sought advice and guidance during this study. The issue of intellectual property rights is always contentious these days – especially intellectual property rights in SMEs in the developing world – and there was never hope of consensus among those consulted. A variety of views has informed the study, leaving the authors the task of drawing these together. The result is entirely their responsibility.

EXECUTIVE SUMMARY

Small and medium-sized enterprises (SMEs) are an invaluable national resource, and one much neglected. The market often fails to respond to the signals sent by SMEs, and governments everywhere intervene to compensate. But deciding to intervene is much easier than deciding what form intervention should take. What sort of interference assists a sector comprising so many diverse units?

One broad policy thrust seeks to improve the competitiveness of SMEs so that they may be more effective in the market, creating both jobs and wealth. There are numerous ways in which governments try to do this. Among them is the encouragement of innovation. With new products and processes, it is argued, SMEs will be more competitive. This argument glosses over the problems and uncertainties inherent in innovation, and ignores the fact that most innovation fails. If innovation is to play a part in enhancing the competitiveness of SMEs, it seems to follow that intellectual property rights (IPR) must also have a role in as much as IPR facilitates innovation. Others point to the range of other inputs to innovation - from research and development to entrepreneurial spirit, from product champions to tax relief - and declare IPR of little import among these. And so, if IPR makes only a small contribution to innovation, and innovation but a small contribution to competitiveness, it is hard to believe that IPR is crucial to competitiveness.

We do not dismiss these concerns. The problems, however, are complex and because the IPR system is simply not designed for SMEs, they must work hard to glean benefits from the system. It is for this reason that many of our recommendations are concerned with ensuring that SME managers have information about what IPR to use and when. Appreciating when not to resort to IPR is particularly important. So, too, is another of our recommendation themes: the use of IPR must be part of a SME's overall business plans. IPR can never be a magic bullet to replace strategy.

Very few managers of SMEs in the ASEAN region have any familiarity at all with IPR. They have much to learn and there is a clear responsibility here for policy makers to arrange help and advice, but always in the context of SME business planning. What policy makers must not do is sell IPR to SME managers as if they were a homogeneous sector. In some cases, encouraging SMEs to resort to IPR may distort their business plans and actually reduce overall competitiveness. While SMEs are disadvantaged in most elements of competitiveness, they do have the advantage of flexibility. They can be quick to market, exploiting niches with new products and processes. If the IPR system is to be of value to SMEs, it is in the context of flexibility and conduciveness to business strategy. The singular advantage of flexibility for SMEs is threatened by a cumbersome IPR system.

This is not to say that ASEAN SMEs should ignore IPR. The TRIPS regime is a reality. ASEAN SMEs must adapt to this reality. Policy makers have a role to play in helping turn abuse of IPR into constructive technology transfer. Above all, ASEAN policy makers should always bear in mind that IPR is a tool of large firms and the developed world. To make this tool useful for SMEs in the developing world will require all the skills its policy makers can command.

It is difficult to monitor the performance of SMEs and their use of IPR from existing databases. Nevertheless, there is evidence that much can be done to align IPR systems with national policies for SME development. It is important to note, however, that the evidence strongly points to the reality that there is no single solution for the diversity of firms and levels of industry development across ASEAN.

The present report has identified a need for future action in five key areas.

1. There is a need for more user-friendly information about IPR, presented in the context of current and potential business plans.

2. There is a need to involve industry associations/professional bodies in preparing and disseminating information.

3. There is a need for SME managers to be able to assess the value of IPR for business strategy.

4. In preparing and providing information and advice to SMEs on IPR issues, there is a need to focus on the place of SMEs in the value chain in order to identify critical points where IPR might be most beneficial.

5. There is a need to develop a regional database on the current uptake of IPR by SMEs and the sectors and types of business activity in which these SMEs are engaged.

Ten recommendations are offered as a starting point for responding to these needs.

I. INTRODUCTION

A. OBJECTIVES OF THE STUDY

Intellectual property rights (IPR) have a major and growing influence on the nature and patterns of economic, social and technological development of developing countries. However, few studies have explored this issue. In particular, the nature of the impact of IPR on small and medium sized firms (SMEs) is not well understood, and certainly not in the ASEAN region (Asasan and Asasen, 2003). This study examines the relationship between SMEs and IPR. Its aim is to promote SME growth and competitiveness in ASEAN through the understanding of this relationship. More specifically, the terms of reference for the study outlined the following tasks:

- Survey and examine the nature, conditions and circumstances relating to SMEs and IP creation and the contribution of IPR protection to SME growth and competitiveness.
- Identify and analyse good practice by business firms (both large and small) in their individual or collective efforts to develop, exploit, protect and manage IP assets and related IPRs within and across the region, the discussion to be supplemented with suitable illustrative case studies.
- Identify and analyse policy constraints and infrastructure bottlenecks on the development, exploitation, protection and management of IP assets and related IPRs. This applies, in particular, to those originating within the SME sector, or associated with collaborative arrangements and linkages between SMEs within and outside the region.

Outputs from these activities were to provide discussion and recommendations concerning:

1. Policy and other measures for the promotion of business innovation, and more effective and sustained IP and IPR development and cooperation involving regional SMEs, other local and external business entities and stakeholders.

2. Policy and other measures to facilitate regional business enterprises, including SMEs, in their planning for the acquisition, licensing and adaptation of IPRs as the least-cost alternative or as required for participation in cross-border production networks and supply chains.
3. Measures to strengthen the development and upgrading of the policy and infrastructure framework in support of cross-border linkages in research and development, and international technological partnerships for commercial purposes involving regional SMEs.
4. The feasible range of national and regional policy measures and options to promote collaborative arrangements among business firms, especially SMEs, as well as IP-related public- and private-sector entities between the old and newer ASEAN economies.
5. Areas for further research, sample questionnaires for follow-up surveys, and illustrative case studies of success or failure (for possible emulation or avoidance by other enterprises) relating to IP creation and IPR protection plus technology licensing and purchases.

Additional issues to be covered in this study included:

1. How to make patents more SME-friendly.
2. Lessons ASEAN might learn from Australia's reform of the petty patent system.

3. The non-patent IPRs which might be used to promote innovation and competitiveness in SMEs.
4. Whether IPR systems and instruments should change as the economies of ASEAN member countries develop to help enterprises innovate and remain competitive.
5. The features that IPR systems and instruments (not just patents) should have for CLMV countries (which are very new to the IPR system), for middle-income countries (such as Thailand and the Philippines), and for the richer countries?
6. The good practices and success stories that proactive ASEAN patent offices might emulate in the promotion of innovation by enterprises.
7. The scope for regional and sub-regional cooperation (within ASEAN and with external partners) in all the above issues.

The consultants set out to achieve these tasks essentially through:

1. existing literature and databases where available;
2. interviews and information collected from selected countries outside ASEAN;
3. a series of meetings surveying patent offices, government trade and industry departments and SME interest groups in each ASEAN country; and
4. e-mailed questionnaires, telephone and face-to-face meetings.

B. SCOPE OF THE STUDY

The Trade-Related Aspects of Intellectual Property Rights Agreement (TRIPS) establishes a set of international standards and procedures for the protection of intellectual property rights. TRIPS integrates and builds on provisions previously incorporated under international treaties and conventions developed over many years for the protection of such rights. Many of these international conventions and agreements have been critical to the pathway of TRIPS and the protection of intellectual property rights in the Asia Pacific region over the past decade. The TRIPS Agreement recognises the need for effective enforcement of trade-related intellectual property rights. Under TRIPS, each member country can determine the method by which obligations are implemented within its own legal system and practice. In recognition of the problems facing the least developed countries, TRIPS allows phased timing for introducing changes for compliance with the agreement. TRIPS provides an important context for the present study (see Blakeney, 1996; Innes and Turpin, 1999).

Copyright and Related Rights

Copyright provisions include measures to protect computer programmes and extend international protection for compilations of data, rental rights for sound recordings, films and computer programmes. Also protected are rights afforded to performers, producers of sound recordings and broadcast organisations. The minimum term of protection for works is generally 50 years from publication. In Europe, protection is for 70 years from the death of the creator. Criminal penalties and enforcement procedures are included to limit commercial piracy of copyright.

Trademarks, Service Marks and Trade Names

'Marks' means any visible sign capable of distinguishing the goods (trademark) or services (service mark) of an enterprise. 'Trade name' means any name or designation identifying or distinguishing an enterprise. TRIPS protects the use of signs, or any combination of signs, capable of distinguishing the goods or services of persons in the

course of trade where use is likely to result in confusion. Initial registration is for no less than 7 years, and registration is renewable indefinitely. Registration can be cancelled only after at least 3 years of non-use. Protection for well known marks is broadly extended to facilitate international trade of products and services, and to deter counterfeiting.

Geographical Indications

TRIPS provides sanctions to prevent persons falsely representing that a good originates in a territory or region where the quality, reputation or characteristic of the good is essentially attributable to its geographical origin.

Industrial Designs

TRIPS protects industrial designs that are new or original, extending to the grant of rights to prevent third parties making, selling or importing articles, or copying protected designs without an owner's consent. Rights are protected for at least 10 years.

Patents

TRIPS protects inventions, including products and processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application. Patent holders are given the exclusive right to protect the use of products made with a patented process, and to control the production, sale and import of a patented product. Individual countries can exclude plants and animals from patentability. The term of a patent is universally extended to at least 20 years, and 26 years for pharmaceutical patents.

Layout Designs (Topographies) of Integrated Circuits

TRIPS requires compliance with the main provisions of the Washington Treaty on Intellectual Property in Respect of Integrated Circuits. It protects right holders from unauthorised sale, import, or other forms of commercial distribution of integrated circuits.

Protection of Undisclosed Information

Protection is included under TRIPS to prevent others from acquiring or using information without consent in a manner contrary to honest commercial practices under the rules relating to unfair competition. To attract protection, the information must be secret, have commercial value, and be subject to reasonable steps to keep it secret.

Control of Anti-Competitive Practices in Contractual Licences

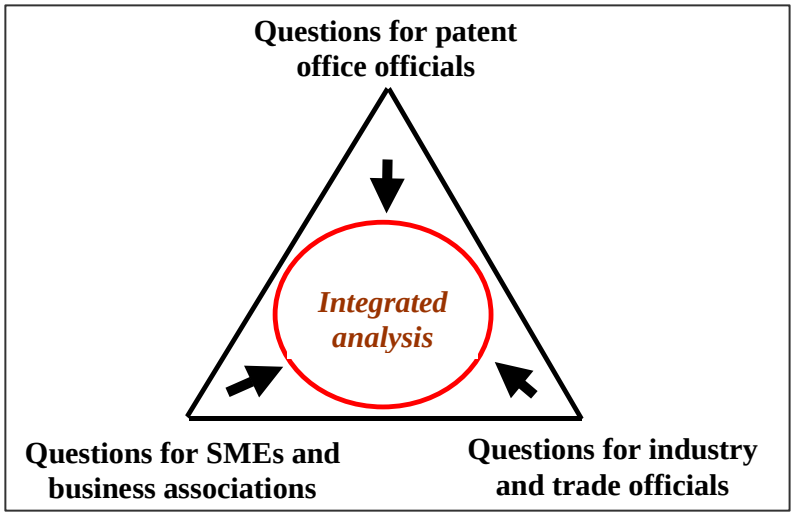
TRIPS acknowledges that licensing practices relating to intellectual property can have adverse effects on trade and technology transfer through anti-competitive conduct. Individual countries may adopt appropriate measures to prevent or control such practices.

The present study is concerned with how these various forms of IPR can serve to enhance the competitiveness of SMEs. In the fieldwork phase, interviews were carried out with three categories of respondent. First, we collected information from those directly involved in IPR processes and administration. These people included representatives from patent offices as well as those involved in the process of IPR registration, such as patent

attorneys. Secondly, we collected information from government agencies responsible for industry policy, particularly those with a mandate to support the growth and competitiveness of SMEs. Thirdly, we sought information from professional associations reflecting the interests of SMEs, and from representatives of innovative SMEs. These three perspectives have been used to establish an integrated approach to the analysis (see Figure 1).

Interview respondents were drawn from agency website resources, the project team's existing database on IPR and SMEs, a list of names provided by ASEC and follow-up contacts proposed by interview respondents themselves. In some cases, focus group meetings were held to discuss selected issues. Face-to-face interviews were held in Jakarta, Singapore, Malaysia, Manila, Thailand, Cambodia, Vietnam, and Lao PDR. In addition, interviews were held with representatives from a range of patent offices and SME development agencies outside the ASEAN region. These included interviews in Hong Kong, Taiwan, Australia, Denmark, England, Geneva, Belgium, Germany and France. Appendix 2 provides a list of people and organisations interviewed. Illustrative cases were also collected during these interviews.

Figure 1.1: Schematic Illustration of the Approach to Data Collection



C. STRUCTURE OF THE REPORT

This first chapter sets out the key tasks covered by the study and the approach taken to deal with the issues and questions. Chapter 2 provides an overview of the experiences of various countries and how IPR has (or has not) been used to promote the development of SMEs. Attention is drawn here to the experiences in other countries that can serve to inform the questions and issues posed for SMEs in the ASEAN region. This Chapter draws on existing literature in response to Terms of Reference (TOR) 1, and sets the scene for the analysis that follows.

Chapter 3 reviews the ASEAN IPR context to provide a background to the subsequent discussion concerning the relationship between SMEs and IPRs. This includes an overview of the IPR system across the region, with an emphasis on IPR and SME policy objectives and trends. The emphasis in this chapter is on the operational features that concern IPR and SMEs within ASEAN. Attention is drawn to some integration issues that confront countries where the IPR system is either very new or fragmented across different

agencies. This part of the report deals with TOR 1, but also with TOR 2, and lays the foundations for Outputs 1 and 2.

Chapter 4 introduces some case studies to illustrate the main issues that emerged. The case studies serve to illustrate the indirect and often complex ways in which IPR can potentially contribute to SME competitiveness. Policy options and strategies set in place elsewhere in the world are used to illustrate some useful lessons for ASEAN. The core of these sections responds to TORs 2 and 3 and, in particular, Outputs 3 and 4. Examples are included of how these issues have impinged on, or supported, SME development, and how other countries have approached similar issues.

Chapter 5 introduces a set of options to enable SMEs to make better use of the IPR system. Drawing on the international experiences and the current review across ASEAN, a range of possible long-term and short-term options is proposed. The chapter contributes mainly to Outputs 3 and 4, responding primarily to TORs 2 and 3. Options proposed focus primarily on:

1. *measures for the promotion of business innovation*, and more effective and sustained IP development and cooperation involving regional SMEs and other business entities and stakeholders;
2. *measures that facilitate regional business enterprises,* including SMEs, in their planning for the acquisition, licensing and adaptation of IPRs;
3. alternative options for participation in *cross-border production networks* and supply chains;
4. *measures to strengthen the development of the policy and infrastructure framework* in support of cross-border linkages in research and development, and international technological partnerships for commercial purposes involving regional SMEs; and
5. a feasible range of *national and regional policy measures to promote collaborative arrangements among business firms*, especially SMEs, and agencies concerned with IPR.

A final chapter summarises the implementation issues and suggests areas where further research would help ASEAN SMEs to make the most of the IPR system.

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II. IPR AND SMES: INTERNATIONAL EXPERIENCES

A. THE IPR LITERATURE

The vast majority of literature in the field of intellectual property rights (IPR) comes from the disciplines of Law and Economics. This has long been the case, and has conditioned the way in which IPR is perceived. Law produces by far the longest and most detailed articles on the subject, articles overwhelmingly concerned with the minutiae of legislation. By and large, they are written by lawyers for lawyers. Only occasionally does a legal journal carry a paper concerned with the socio-economic implications of IPR legislation (e.g., Merges, 1988). Economics takes a much broader approach than Law and it is to Economics that we look for explanation and justification of the IPR system. Economics explains the need for rather special legal arrangements to cater for intellectual as opposed to physical property (see, for example, Machlup, 1958; Markham, 1962; Taylor and Silberston, 1973). Without such arrangements, we are told, the product of creativity would be stolen, the nature of information allowing its ready purloining, and so the creative would be unable to reap the harvest of their labours. Without financial incentive, so the argument runs, the creative would not create and both they and society would be the poorer.

There is nothing at all wrong with this theory, but practice is quite another matter: with a few specialised exceptions, innovation is as likely to occur without IPR as with it (Mansfield, 1986). In SMEs, the evidence that innovation is much stimulated by IPR is particularly sparse. There is another aspect of economic theory that applies peculiarly to patents, but is also applicable to industrial designs. It is that the IPR system encourages innovation not simply by granting temporary monopoly rights to the inventor, but also by making public the information of invention. A bargain is struck between the inventor and society by which the inventor gets his temporary monopoly and society gets the information of invention. Once again, the theory is impeccable: in practice, both sides break the bargain. Society affords protection only to those who can afford to defend their IPR, and inventors do not disclose all the information of invention.

Other disciplines seem to be deterred by the expert knowledge required to comment on IPR. This is a pity for, at least potentially, they have much to contribute in terms of alternative perspectives and the ability to investigate socio-economic implications. Strange that Sociology has almost nothing to say about a social system set up to improve the public good, or Politics about what has become a significant weapon in international power struggles. Science and Technology Policy once dominated discussion on the effects of IPR (e.g., Dunford, 1987), but the discipline has shrivelled with the widespread acceptance that resources are best allocated by the market rather than by policy, and specifically with the rise of Management Studies. History takes a little more interest and provides a useful reminder that the IPR system is dynamic. It has changed greatly over the centuries and has long been as much abused as used (Dutfield and Suthersanen, 2005). History provides a useful reminder that the IPR system is an artificial construct, a social tool to be shaped and exploited as society requires.

IPR, whether in the form of patent, industrial design, copyright or trademark, can, according to theory, provide an owner with an asset that can be exploited for commercial gain (Ancog, 2005). The extent to which this potential can be realised and by whom depends on the business strategy of the firm. There may be situations when one form of IPR can protect the product and another the process used to develop it. For example, a food formulation which is enriched by vitamins may be covered by a copyright while the process of producing the food product may be covered by a patent. The brand of the whole may be covered by a trademark (Ancog, 2004). Thus, realising commercial benefit for the IPR owner will often depend on successful ‘mixing and matching’ of different forms of IPR. The literature, however, consistently shows that it is predominantly larger firms that have the business capacity and resources to build and, importantly, protect an integrated portfolio of IPR.

Innovation, the driver of competitiveness, depends not so much on the creation of IPR as on the capacity to exploit IPR in the context of business strategy (OECD, 2004).

Box 1: Protecting Design in the Furniture Industry

The furniture industry is one of the largest industries in Indonesia. It has developed its own designs and now exports heavily to the developed world. However, its designs are being copied, specifically in Vietnam. The Indonesians have not registered their designs: the Vietnamese have. One consequence is that the Japanese government is now prosecuting importers of Indonesian furniture for infringing the registered designs of the Vietnamese. At issue here is the 'first to register' requirement that is often only partially understood by the managers of firms, particularly those responsible for SMEs.

The potential contribution of IPR to SME competitiveness becomes much more complex when it is understood in the context of business strategy. For innovating SMEs, access to development finance is critical (see OECD, 2004). Assets held within these firms are often intangible and although entrepreneurs may own IPR with potential commercial value, there is often a significant information gap between potential investors and entrepreneurs in terms of understanding or articulating the value of IPR (OECD, 2004:39). The extent to which the ownership of trademarks, industrial designs, copyright, and patents can contribute to firm competitiveness is therefore not determined by a linear economic process that converts knowledge into product or process. Rather, it is a product of the various ways that IPR can become usefully embedded in business strategy; for example, to gain access to finance and establish new markets (Ricketson, 1984). IPR within business strategy is important for SMEs, not IPR itself.

The situation, then, is subtle, but it is important that it be understood. SMEs comprise the vast majority of all firms in the ASEAN region and elsewhere. It is essential that they be competitive if local prosperity is to grow. Thus far the argument is undisputed. It is also clear that innovation is not the only path to competitiveness in SMEs. Competitiveness in SMEs is determined by a whole host of factors, including the skills and education of managers and the workforce, as well as local and national government policy. Analysis of these factors is beyond the scope of this report. IPR is only one small part of the overall process in SME innovation, and generally plays a negligible role in any competitiveness springing from innovation. This does not mean that IPR cannot make a greater contribution to SME competitiveness, but this route lies through the accommodation of IPR in business plans rather than through innovation.

Box 2: Designs and Branding Strategy

This case is of a UK designer of cutlery and associated tableware. Her designs used to be converted into manufactured goods in the UK, but a steady increase in orders from major UK stores encouraged her to find a cheaper manufacturer. She has been contracting out to a Vietnamese manufacturer for the past two years and visits Vietnam every six months or so. Her designs are registered in the UK, but not in Vietnam. She is considering registering her designs in Vietnam, but has found no one in either Vietnam or the UK to provide advice on the advantages and disadvantages of doing this. *(Continued on the next page)*

Box 2 (Continued)

She is considering registering her designs in Vietnam, but has found no one in either Vietnam or the UK to provide advice on the advantages and disadvantages of doing this. She feels she should be reinforcing her existing IPR with trademark registration, but has no idea whether it would be better to register trademarks where the goods are produced or where they are marketed. One of her designs was copied last year, manufactured and bought by one of her own customers, a large UK store. When she brought this to the attention of the store, it cancelled its order for the copied goods immediately. If she does extend her IPR, she feels she should do so in tandem with a branding strategy, but has no idea how to accomplish this.

B. SMES AND INNOVATION

The literature on SMEs and their innovation is very much concerned with government policy. Policy is directed at increasing the innovation, and hence the competitiveness, of SMEs. The argument is that market failure of various sorts prevents SMEs making the optimum use of their resources unaided, and that governments should intervene to help (Rothwell, 1986). A simplistic view of SMEs is common among policy makers. They tend to see SMEs simply as nascent large firms that should be exploiting innovation to realise their growth potential. SMEs, it would seem, have no business being small. Of course, many managers of SMEs have no ambitions at all to manage large companies (Reid, Dunn, Cromie and Adams, 1999), and modern economies are dependent upon the part that SMEs play - as SMEs (Rothwell, 1989). This point was reinforced in our ASEAN interviews, especially in Thailand, Indonesia and the Philippines, as well as more generally in the literature on SME development in Taiwan, Japan and the Republic of Korea (Harvie and Lee, 2002).

Innovation, and perhaps particularly innovation in SMEs, is complex. It is also the product of serendipity and happenstance as much as managed and controlled process. Yet policy leans heavily towards a linear view of their innovation. It is convenient to be able to justify input in terms of output, to relate resources in to innovation out. So, policy makers and politicians have an interest in maintaining the fiction of a linear innovation process no matter how high the chances that programmes based on this notion will fail (Culkin and Smith, 2000). The many European Union programmes to assist SMEs seem especially prone to failure (Dannreuther, 1999).

SMEs perform an important role in the economy, but their contribution to national systems of innovation remains ambiguous. For example, SMEs are generally users of technology rather than producers (Bessant, 1999). Exceptions, as Bessant points out, are in the knowledge-intensive fields. However, irrespective of whether they are technology producers or users, their role in the *diffusion* of technology can be significant. Many SMEs are linked to large, technology-intensive firms as suppliers or customers. In addition, many SMEs are part of clusters that include substantial technological input from publicly-funded research institutions (Bessant, 1999). In assessing the role of IPR in enhancing competitiveness of SMEs, it is therefore important to consider the role of SMEs as technology diffusers as well as their direct role in innovation (Wong, 1996)

The reality of innovation in SMEs is often at variance with the theory behind policy for innovation in SMEs. The evidence is that SMEs are already surprisingly innovative. They have to be innovative to survive. Their problems lie elsewhere. Basically, SME managers are far too busy coping with a wide range of immediate demands to give much attention to less pressing matters. Thus, their horizons are limited, their view of the world restricted. According to one survey of innovation in UK SMEs, nearly a third earn more than half their turnover from their three largest customers (Marsh, 1996). Such dependence on dominant partners in supply chains is a long way from the relationships observed among firms in the vibrant

information networks of high technology. The typical SME is isolated, which is presumably why SMEs look to their own resources for development. Inevitably, these resources are limited and often inadequate. The result is often frustration, not just with failure in innovation, but also with government exhortations to succeed that are based on an inappropriate understanding of how SMEs innovate.

In theory at least, the IPR system is particularly appropriate for encouraging the creativity of small firms and independent inventors. Large organisations are more likely than small to have the internal resources to develop their own inventions, and so can keep the information of invention to themselves. Smaller organisations must generally seek these resources outside and so must reveal all. In practice, though, the protection that the IPR system affords the weak against the strong is often illusory, and the problems small firms encounter in protecting their inventions through the patent system are widely acknowledged. There is much less questioning of the advantage they and their innovation are claimed to reap from the other part of the patent bargain, the information the patent system makes available. Patent specifications, according to patent office officials, provide a particularly rich source of information for SMEs:

> Patent specifications are a source of valuable technical information, readily available and much of it *free* for the taking. It is a pity that *so few* manufacturers, engineers and scientists seem to be aware of this. So next time you have a technical problem, check to ensure that it has not been solved already. Even if you don't find a ready solution, you may pick up some good ideas for use in your current or future design. [original emphasis] (Australian Patent Office, 1981, p.2)

> Each patent specification is a detailed disclosure of the invention and it is this aspect of course which is particularly valuable as a rich source of technical information. (Blackman, 1994, p.47)

Such assertions are in conflict with the evidence. Of all the many sources of information for innovation, SMEs use the patent system least of all (Macdonald and Lefang, 1997). In as much as SMEs find any use for the information the patent system provides, it is to prepare applications for their own patents. When this happens, the patent system is serving the system itself rather than the requirements of innovation. Even the SMEs that search to keep track of competitors are more interested in keeping track of their competitors' patenting than their competitors' technology.

So, SMEs make little use of the information in the IPR system for their innovation, but they rarely use the monopoly provisions of the system either. One survey of SMEs in the UK found that about half did not apply for patents even on inventions they thought were patentable (Macdonald, 2003b). Of those that did patent an invention, 87% would have developed the invention even without a patent. Licensing patents to others was not a popular course. Nor had the vast majority licensed patents from anyone else over the previous decade. Not a single firm could boast that it frequently licensed patents from others. Of the few firms that did occasionally license, most gained knowhow as part of the agreement, but the licence also imposed restrictions on what they could do with the technology. Most common among these restrictions were agreements not to sell outside a geographical area, not to dispute patents, not to sell competing products, and agreements to buy parts from the licensor and to license back improvements.

Box 3: Licensing and Business Strategy in Bangkok

A Bangkok SME made under licence almost all of the components required by a Japanese manufacturer of motor bikes. After fifteen years, the Japanese firm decided to abandon the motor bike business. *(Continued on the next page)*

Box 3 (Continued)

The Bangkok parts firm began what proved to be protracted discussions to take over full manufacturing. The Japanese firm resisted the developing business strategy in Bangkok and resorted to a complex set of IPR regulations in order to maintain its monopoly on production. The SME managers in Bangkok suddenly had to become familiar with licensing regulation requirements, obligations and options in order to persuade the Japanese firm to withdraw from legal proceedings.

Most SMEs seem to rely very heavily on their own resources for their innovation. There is a range of likely reasons for this, but basically they come down to employees of small firms, and especially senior managers, having few resources available to search for information in the outside world and to use the information acquired there. In a small firm, everyone is needed for day-to-day operations, to man the pumps. It should come as no surprise that SMEs are often highly innovative; their innovation is a necessary response to competition and the fluidity of their markets. IPR is little valued and innovation is rife in its absence (Kahaner, 1983).

While the relationship between patenting and innovation has been a focus of debate for decades, other forms of IPR, including trademarks and copyright, are assumed to be more appropriate for SMEs and to contribute more to their competitiveness. As we illustrate in the following chapters, these forms of IPR can be used to underpin strategies for establishing new markets, to consolidate brand names, or to raise finance for expansion. Trademark registration serves not to protect a new technology, but to gain branding protection in new markets. Evidence discussed later in this report illustrates that ASEAN-based firms are increasingly relying on this form of protection as part of their market strategy. Trademark registration appears to reflect a strategic approach to marketing, industrial designs reflect a production approach to business planning, while patents reflect a long-term approach to innovation that is rare in SMEs. A study of the internationalisation of SMEs in Finland, Australia, France, Mexico and the UK revealed that these firms had twice as many trademarks as patents, though neither was critical to their internationalisation (Rodriguez, 2005). As Arup (1993, p.15) has pointed out, IPR should not encourage SMEs to '"stand alone and exclude others from access to a resource", but rather to build links with other firms, researchers and organisations, workers and subcontractors.

> Instead of concentrating exclusively on the appropriability of particular inventions (through the intellectual property of patents and copyright), we should look to legal opportunities for the capture of such important assets as intangible know-how, the expertise of skilled workers and the learning of specialist firms (Arup, 1993, p.15).

This raises important strategic and policy issues for SMEs, particularly those embedded in small economies. These firms are in comparatively weak bargaining positions with large firms from large economies, yet establishing links with other firms is crucial for their development. Relationships involving SMEs and large firms, domestic or foreign, can be very close: a recent survey in Japan revealed that half of large firms undertook joint research with SMEs (Doi and Cowling, 1999). Involvement of a large firm warns off those who would infringe the SME's IPR. In economies based on new and intensive technologies, it is access to information rather than the ownership of information that counts. Industry clusters provide a mechanism for SMEs to gain access to new information and new technologies (Marceau, 2000). Small size can enable SMEs to adapt quickly to new opportunities. They are flexible in a way large firms are not. SMEs in the Taiwan economy were able to advance during the 1970s because they were equipped with a more flexible set of technologies, and were more

adaptive to the external environment than their larger counterparts (Schive, 1995). An Australian innovation survey, for example, found that the larger the firm, the more likely it was to engage in innovative activities, but the mode or nature of innovation differed according to size of firm (Australian Bureau of Statistics, 1994). The pace of innovation among SMEs was fast and involved only small amounts of capital investment. For small firms (fewer than 20 employees), the median time to commercialisation was 6 - 12 months, whereas for firms with over 100 employees the median time was 1 to 2 years. Further, the median cost for the small firms was $A10-50,000 per innovation compared with over $A100,000 for large firms.

Japanese SMEs rely heavily on research alliances with enterprises from different industries and research institutes belonging to local government. These alliances play a crucial role in Japan's national innovation system and are central to maintaining Japan's innovative capacity (Sugasawa and Liyanage, 1999). In China, the rapid growth of village enterprises has been facilitated through complex alliances between scientists, engineers, academics and business entrepreneurs (Harvie and Turpin, 1997). As Christerson and Lever-Tracy (1997) note, the impressive growth among these Chinese enterprises reflects the pattern evident in the industrial development of the 'Third Italy'.

C. SMES AND IPR IN PRACTICE

There is surprisingly little research on the actual use of IPR by SMEs. What has been carried out is almost unanimous in declaring that, with few exceptions, SMEs make little use of IPR (e.g., Arundel and Steinmuller, 1998; Blackburn, 2003). There is little interest in why this might be. The problem for government policy is seen to be simply how to help SMEs make more use of IPR (Burrone and Singh, 2003). Typically this is to be achieved by exhortation, public relations, advertising, roadshows, and so on; and by adapting the IPR system to make it more appropriate for SMEs with petty patents and the like. Interviews for the present study indicated that SMEs are unaware of the potential benefits of IPR. In the ASEAN region, large firms and foreign firms typically dominate the IPR world, particularly patenting.

It has been suggested that at least some of the troubles SMEs encounter with IPR might be overcome by catering for their special circumstances. A major problem is that SMEs often cannot afford to enforce their IPR monopolies. Various schemes by which SMEs might insure against infringement are currently under investigation in the UK and by the European Commission. The difficulty, of course, is that the weaker the monopoly claim, the greater the private benefit from insurance, and the greater the public cost in terms of preserving the monopoly. Various schemes for technical arbitration, at least for patents, offer a way round this obstacle (Kingston, 2000), but it is unclear under what circumstances arbitration would be adopted, and how arbitration would relate to other IP law.

It is often argued that the other forms of intellectual property protection - registered designs, copyright and trademarks - being simpler devices, are of more practical use to SMEs than patents. From the point of view of innovation, this may be questionable. SMEs tend to see little link between any form of intellectual property rights and their innovation (Macdonald, 2003a). However, some SMEs have integrated various forms of IPR into their marketing and business plans. Trademarks and trade secrets appear to be more valued than copyright and industrial designs.

The innovation of SMEs tends to be fortuitous, spurred by threat or opportunity, often to supply only a niche market, and then perhaps but temporarily. The IPR system, on the other hand, envisages much planning with resources permanently dedicated to research and development. It was always optimistic to assume that a single IPR system would suit all organisations, the small engineering firm as much as the multinational oil company. And it was always disingenuous to present IPR theory in terms of the particular benefits the IPR system affords the small and the weak. IPR practice has long meant that these benefits have

generally been reaped only by the large and the strong. And yet governments are immensely fond of presenting case studies in which SMEs succeed through their use of IPR, and particularly patents. Other SMEs are exhorted to follow their example. The reality is that SMEs make little use of IPR in their innovation. How then, can IPR support the competitiveness of SMEs? What needs to change and how?

The IPR system has changed a great deal in the last 20 years. The scale and scope of the patent has been much extended with the result that its value has grown both absolutely and in relation to other forms of IPR. The patent has become very much the IPR of choice in the global economy. There is now very much more IPR, especially patents, and much more interest in protecting and exploiting the value in IPR. Corporate strategy is increasingly finding a central place for IPR, though not necessarily to facilitate innovation. IPR can have a strategic value in its own right, quite detached from any part it might play in innovation.

The administration of IPR has also changed. National patent offices find themselves pushed into the limelight, expected to be leading actors in government innovation policies. They are often agencies, distinct from government departments and forced to justify their existence not in terms of public benefit, but rather in terms of transactions. Many are supposed to turn a profit from their IPR business. Integration of national IPR activities by international agreement, consolidation of functions in such organisations as the European Patent Office, and contracting out such IPR tasks as searching, are turning IPR administration into a global business.

The literature is generally consistent in arguing that neither the new strategic importance of IPR nor the growing internationalisation of its administration seems to be making the IPR system more attractive to SMEs. On the contrary, the value that SMEs might find in IPR seems to have become more elusive than ever. The more the value of IPR lies in grand international strategy, the less likely are SMEs to be able to realise this value. There are, of course, exceptions, most notably the high technology SME, its business dominated by a single new product or process and instantly global. For these SMEs, innovation is inseparable from the strategic exploitation of IPR. But these are not typical SMEs. The vast majority of SMEs may be just as innovative, but they innovate in other ways. The innovative advantage of the typical SME lies in speed to temporary niche market. This is not an advantage that recent changes in the IPR system have done much to complement.

It is all too easy to assume that it is through innovation that SMEs benefit from IPR: the small and the weak seize the advantage offered by temporary monopoly in order to innovate. But it is quite clear that, in many cases, the small and weak are unable to enforce their monopoly. Nor do SMEs generally innovate by exploiting the information the IPR system makes available. This tends to be information about the IPR behaviour of others rather than information for their own innovation. SMEs have never innovated by meticulously trawling IPR databases. Indeed, the very databases that patent offices offer SMEs to aid their innovation are inaccessible in practice, and unsuited to their requirements anyway. They are suited to IPR professionals, practiced and skilled in their use, people who are searching for very specific information for very specific purposes. They are not appropriate to SME managers after a quick and easy way to assess threats and opportunities.

Box 4: Patent data bases for SMEs

The European Patent Office sets the following exercise in its workshops to teach SME managers how to use its patent databases:

I am writing to you from a pest control company in the South West of England, U.K. I have a mousetrap that is made in Sweden, *(Continued on the next page)*

Box 4.(Continued)

but cannot find the manufacturers or designer to talk to them about marketing and distributing this product in the U.K. Having introduced it at a tradeshow this weekend, I have many customers wanting to sell the product to the general public. I am not sure whether the design has yet been patented, because it has pat. Pend S/39 stamped on the actual trap, and have now run out of ideas where to source this product. Stamped on the underneath of the mousetrap is Konstruktion Goran Hansson VPLAST SWEDEN. If you can be of any help to me in my search please e-mail me back. Thank you.

In fact, the information sought is unobtainable from patent databases without considerable knowledge and experience of searching techniques. On the other hand, Google provides instantly all the information this SME manager requires.

An effective role for IPR in supporting the competitiveness of SMEs must then not be built simply on an assumption that IP protection and the diffusion of information through the IPR system will increase innovation. Just as SMEs have always been able to use IPR only by accommodating it within their business strategy, so the new IPR regime must also be accommodated. A recognition of this reality must be central to efforts to utilise the IPR system for enhancing the competitiveness of SMEs. This observation has important implications for the support of SMEs in the ASEAN region. As ASEAN moves further towards an ASEAN Free Trade Area, business pressures and opportunities will change. A new approach to IPR will be required. The ASEAN Framework Agreement on Intellectual Property Cooperation (1999) offers a platform on which to build a closer nexus between IPR and SME competitiveness.

D. CONCLUSION

Many SMEs do compete successfully in regional and global markets and they do innovate. But the relationship between IPR creation and ownership, innovation and competitiveness is complex. The literature is consistent in showing this is no simple linear process. While there is evidence that production and ownership of patents and industrial designs can provide a solid platform for innovation in large firms, evidence of SMEs depending on IPR to yield the innovation that brings competitiveness is limited to relatively few firms in specific industry sectors. On the other hand, there is evidence that IPR can contribute to competitiveness in other ways, by helping to establish and defend new markets, or to raise venture capital. It is in this broader context that the relationship between IPR and SMEs in the ASEAN region needs to be considered.

III. IPR IN THE ASEAN CONTEXT

A. IPR SYSTEMS IN THE ASEAN REGION

As our country studies and interviews show, the impact of the General Agreement on Tariffs and Trade, the World Trade Organisation, and TRIPS has prompted uniform legislative change in relation to intellectual property rights across the region. The capacity of many countries to determine, and enforce, the intellectual property rights of SMEs remains to be tested. Uncertainty exists over the resource capacity of developing countries to establish and maintain:

- *regulatory infrastructure* to support the implementation of new intellectual property laws;
- *administrative review procedures and judicial appeal mechanisms* to determine disputes in relation to intellectual property rights;
- *information management systems* for filing applications, handling registrations, inquiries, examinations, publication and other administrative functions; and
- *training and educational programmes* that promote knowledge, awareness and understanding of intellectual property laws within government agencies, scientific communities and the general public.

In the following section we have clustered IPR systems into two categories: those in countries where legislation and administrative procedures are well established and have been in place for at least the past decade, and those in countries where legislation and procedures are in place but are still evolving in terms of international standards.

Countries with well established IPR systems

	The Philippines	Singapore	Malaysia	Indonesia	Thailand	Brunei Darussalam
Categories	Copyright and related rights; trademarks and service marks; geographic indications; industrial designs; and integrated circuits; protection of undisclosed information	Copyright; trademarks; registered designs; geographical indications; layout design of integrated circuits	Patents, trademarks, copyrights, utility innovation	Patents, copyrights, trademarks (incorporating important principals consistent with Indonesian legal history and culture	Patents, copyrights, trademarks, product design	Patents, copyrights; trademarks, industrial design
Implementing Agency	IP Office, Dept of Trade and Industry	Intellectual Property Office of Singapore	Patent registration Office, under the Intellectual Property Corporation.	Directorate General of Intellectual Property Rights	Department of Intellectual Property (DPI)	Ministry of Law; Industrial Property Office; Copyright Office
Features	First to file; mandatory government publication	First to file	Substantive examination of application. Malaysian citizens required to file with PRO before filing overseas	Requires registration and substantial examination. The application must be in the Indonesian language	Patent (20 years protection) and petty patent (6 years). Foreign patents recognised subject to registration with DPI	
Reciprocity	Protects foreign nationals whose countries accord similar rights	TRIPS compliant for legislation and administration, Paris and Berne conventions, Madrid protocol; Patent	Patent Cooperation treaty, berne Convention and WIPO Reciprocal rights extended to nationals of countries which	Protection to nationals of countries which give Indonesian nationals IPR protection	Accession to patent Cooperation treaty in process	WIPO, TRIPS

		cooperation treaty	accord IP rights to Malaysians			
Exclusions	Discoveries, scientific theories and mathematical models; schemes, rules and methods of doing business		Discoveries, scientific theories and mathematical models; biological processes; schemes, rules and methods of doing business; methods of human and animal treatment	Processes or products contrary to prevailing laws, scientific theories and mathematical models; morality and public order; biological processes; methods of human and animal treatment	Micro-organisms and their components, plants and their extracts and animals; methods of diagnosis and treatment of human and animal disease; inventions contrary to public order, morality, health or welfare	
Penalties and enforcement	Civil liability for damages		Authorised officers or police officers may seize infringing products/materials	Civil and criminal suits. Police and civil servants authorised to conduct investigations	Criminal sanctions	Through industrial property tribunal and copyright tribunal

Countries with recently established IPR systems

	Vietnam	Lao PDR	Cambodia	Myanmar
Categories	Patents, trademarks, industrial designs, copyrights	Trademarks, petty patents and industrial designs	Patents, trade marks and copyright	Trademark registration is possible but not compulsory
Implementing Agency	National Office of Intellectual Property (patents and trademarks)	Dept. of Intellectual Property, Science, technology and Environment Agency	Intellectual Property Division under the Ministry of Commerce (trademarks); Ministry of Industry, Mines and Energy (patents); Ministry of Culture (copyright)	
Features	New legislation is currently being drafted		.	Limited protection offered if trademark 'warnings' are published in local newspapers
Reciprocity	TRIPS compliant		Bilateral agreements with USA and Thailand	
Exclusions				
Penalties	Enforcement managed through administrative measures			Civil action possible

There is a clear trend toward harmonisation of IPR systems among ASEAN countries. The ASEAN agreement on Intellectual Property Cooperation (1999) has served to contribute to this process. However, there are significant differences between the countries that have been involved with the process for some decades, and those that are still in the early stages of development. A number of issues stand out:

1. all countries recognise the importance of SMEs in their national development plans, but only a few have introduced programmes to inform/support SMEs;
2. among countries at the early stage of IPR development, there are problems of limited human resources, lack of appropriate civil and criminal codes, and fragmentation of responsibilities across different agencies;
3. in most countries, trademarks and industrial designs are perceived as the sort of IPR most relevant to SMEs;
4. in most countries, foreign and large firms dominate use of the IPR system;
5. for countries at the early stage of IPR development, the IPR interests of SMEs are overwhelmed by the demands of large foreign firms. For SMEs, reliance on IPR entails a major business risk.

For those countries with well established IPR systems, there is an emerging harmonisation of laws, regulations and administrative procedures. Most countries in this group have initiatives directed toward supporting SMEs, some of which have implications for IPR. The following examples illustrate the general nature of support.

The **Philippines** disseminates information on IPR to SMEs through seminars. Information on branding is presented in the context of marketing strategies. The IPO is seeking to simplify the language used in order to make better contact with SMEs and identify the value of IPR for SMEs. In **Singapore**, contact programmes are in place for different categories of IPR users. SMEs are themselves involved in the process of making changes to copyright legislation. Singapore is probably the most IPR protective country in Asia. It therefore serves as a useful case study for analysing and benchmarking IPR trends in ASEAN countries. A feature of the Singapore system is the integration of the activities of the Intellectual Property Office with those of other public agencies, such as the Agency for Science, Technology and Research, the Economic Development Board, Standards, Productivity and Innovation Board and the Intellectual Property Rights Branch of the Singapore Police Force.

In **Malaysia,** SME-oriented IPR support programmes focus on business development and marketing strategy (for example, branding) rather than technological innovation. In **Indonesia,** SMEs are a target group for the Directorate General of IPR, but no specific programmes are in place. Agencies responsible for SME development are concerned with finance and strategy rather than with IPR issues. SMEs are identified by the **Thai** government as crucial for national competitiveness. The SME Promotion Act, the SME Promotion Fund, and the Office of Small and Medium Sized Enterprise Promotion have been established as key agencies and instruments for such development.

In **Vietnam,** the National Office for Intellectual Property has observed that SMEs are becoming aware of IPR, primarily trademarks and industrial designs. The intention is to ensure SMEs are informed about all aspects of the forthcoming legislation. In **Lao PDR,** SMEs are recognised as an important group for contributing to national development, but no specific programmes are in place. At this stage, trademarks are considered the only form of IPR relevant to SMEs.

Box 5: The Role of Trademarks in Core Business Plans

The Tien Giang Food Co. is engaged in rice export and other agricultural products. The core product, rice, is exported from Vietnam to Iran, Indonesia and the Philippines. The company is expanding into other parts of Asia, Africa and the Middle East, focusing on its range of organic rice. The business plan for expansion of domestic and export markets includes registering 12 rice trademarks. Trademarks are an integral part of the company's core business plan.

Box 6: The Use of Trademarks in Food Production

The Tien Giang Fruit and Vegetable Co. (VEGITIGI) was established 25 years ago. This Vietnamese SME concentrates on processing local fruit, such as longans, pineapples and mangos. Output includes fresh, canned and frozen fruit. The company has recently invested quite heavily in upgrading processing plant and in improvements to fruit species. VEGITIGI is now using the TIGI trademark to increase consumption across the whole range of products. The TIGI trademark is central to the company's marketing strategy.

In **Cambodia**, SMEs are identified as an important focus for national development The IPR system has not yet been able to target SMEs as specific IPR users. National seminars have been developed in collaboration with WIPO, but there has been little involvement of SMEs. In subsequent sections of this report, we illustrate some of the experiences of SMEs and government agencies in dealing with these issues.

B. EXPERIENCE OF OTHER ASIAN COUNTRIES

Hong Kong provides registration of patents, designs, trademarks, plant varieties, intellectual integrated circuits and copyright. The Intellectual Property Department (IPD), established in 1990, is responsible for advising the Secretary of Trade and Industry on policies and legislation to protect intellectual property in Hong Kong. Registration with IPD is required for the protection of IPR for patents, trademarks and plant varieties, though not for integrated circuit designs and copyright. A new patent ordinance took effect in 1997 and allows continued registration of United Kingdom patents and European patents designating the United Kingdom. A patent granted in Hong Kong is independent of Chinese, European and United Kingdom patents and will be enforced in Hong Kong courts. There are two types of patent: the standard patent, which gives protection for up to 20 years, and the short-term patent, which protects inventions with a short commercial viability for a period of 8 years.

Since Hong Kong does not have the resources to examine patents locally, it remains in part a registration system based on patents first applied for, and granted in, a designated patent office, namely the UK Patent Office, the European Patent Office (designating the UK Patent Office) or the Chinese Patent Office. Application for the short-term patent is submitted directly to the Hong Kong Patents registry. It is examined only as to form, not substance. However, it is necessary to file a search report with the patent office in one of the following: Austria, Australia, China, Japan, the Russian Federation, Spain, Sweden, the United States, the United Kingdom, or with the European Patent Office. The Customs and Excise Department enforces the criminal aspects of infringement of IPR and investigates complaints alleging infringement of trademarks and copyright, and complaints alleging false trade descriptions. For infringement of patents, designs, plant varieties, and integrated circuit

designs, remedy lies in civil action: for trademarks and copyright, remedy for infringement entails both civil and criminal action.

Taiwan provides registration of invention patents, new utility model patents, and new design patents. The Patent Authority, under the Ministry of Economic Affairs, is responsible. Features of the Taiwan patent are (a) the first to file principle - no matter what the invention, priority is given to the first applicant; (b) early publication of invention - the invention patent application will be published after 18 months from the filing date; (c) examination request for invention - the patent application will be examined only after request within 3 years of the filing date; (d) public examination - any person can object to a granted patent within 3 months of its publication date. Protection is provided in Taiwan if the foreign applicant/inventor's country accords similar protection to citizens of Taiwan.

In contrast to Hong Kong, Taiwan has maintained a national focus on SME development. This has been been a major feature of the Taiwan economy over the past three decades. A much higher proportion of SMEs has been involved in technologically-advanced innovation than in other countries. Government policies have concentrated on building collaborative links between firms, and between firms and national research facilities. IPR issues have followed this development rather than driven it.

In 1997, SMEs constituted 98% of total industry establishments in Taiwan, accounting for 78% of the total workforce, and 32% of total sales. The common characteristics of SMEs in Taiwan are: (1) high degree of orientation towards exports; (2) high degree of adaptability; (3) strong teamwork spirit; and (4) ability to reduce risks. The development of SMEs is supported by development funds that provide guarantees and project financing; a SME Policy Development Committee, whose function is to integrate various guidance systems and services networks for SMEs; guidance systems that provide advice on finance and credit, management, production technology, research and development, information management, industrial safety, pollution control, marketing, mutual support and quality enhancement; and Service Network Centres throughout the island that offer assistance to SMEs (http://www.actetsme.org/taibest.htm).

One of the lessons to emerge from this comparison is that national policies for promoting SME development require a multifaceted policy approach. Competitiveness has emerged in the Taiwan economy not simply through the application or uptake of IPR by SMEs, but by aligning a number of contributing factors. These include incentives for technology upgrading, creating networks of SMEs, large corporations and research institutions; and removing bottlenecks in finance and credit schemes.

C. ASEAN IPR STATISTICS

Although considerable progress has been made toward harmonisation of IPR legislation and administration, it is not easy to discover the extent of IPR use in the ASEAN region. Government departments responsible for IPR have different working practices and operate under a range of regulatory and legislative IPR regimes. Even the terminology of IPR differs from country to country. Statistics are collected in most ASEAN states, and published in all but Myanmar, but there is vast variety in how consistent and comprehensive these statistics are. Although there have been moves towards an ASEAN agreement on IPR, little progress appears to have been made in making the IPR data of ASEAN countries compatible and, importantly, readily accessible. Where data are available from international sources, they usually concern patents rather than the full range of IPR categories. As discussed below, it is these other categories, particularly trademarks, that most concern SMEs

Some countries make annual returns to the World Intellectual Property Organisation (WIPO) in Geneva, the body responsible for the international IPR data, but most do not. Only two or three ASEAN countries make regular returns, and even these can be very late. There are huge inconsistencies and illogicalities in the data, and sometimes typographical errors.

Consequently, even ASEAN policy makers with responsibilities for IPR must often be at a loss to know what is going on. Those less familiar with IPR must be even less certain. There is simply no sound statistical basis for determining what impact IPR may be having on the economy, or what impact the economy may be having on IPR. We have been bounded by public availability in the statistics we have used, putting ourselves in the position of individuals seeking to be informed. We have deliberately not sought privileged access.

It is important to place ASEAN IPR in context. There were over 1,300,000 patent applications made in the world in 2001, 81% by residents of Japan, the United States and Europe. Residents of all other countries combined accounted for just 19% of all patent applications (*Trilateral Statistical Report*, 2002). ASEAN data does not allow even an estimation of what proportion of world patent applications is made by ASEAN residents, but US data does provide some sort of proxy. Because of the size of the US market, US patents are keenly sought. Table 3.1 shows the number and proportion of US patents granted in 2001 to residents of ASEAN countries.

Wherever possible in the following Tables, Australia, being a developed country contiguous to the ASEAN region, is used as a comparator. Table 3.1 reveals Australians to have been responsible for 0.5% of US patents for invention granted in 2003. All the ASEAN countries together were responsible for rather fewer, just 0.3% of the total for that year, Singapore accounting for nearly all of this. This distribution of patenting is broadly compatible with that evident within the ASEAN region, as shown in Table 3.2. The striking difference is that, although there is significant domestic patenting in Indonesia, the Philippines and Malaysia, only Singapore patents are registered in significant numbers in the United States.

Table 3.1 US Patents for Invention Granted to Residents of ASEAN Countries and to Residents of Australia

	1999	2000	2001	2002	2003	Total since 1963
Australia	707	705	875	859	900	14725
Brunei	0	0	0	0	0	1
Indonesia	5	6	4	7	9	151
Malaysia	30	42	39	55	50	356
Myanmar	0	0	0	0	0	4
Philippines	11	2	12	14	22	245
Singapore	144	218	296	410	427	2098
Thailand	20	15	24	44	25	205
Vietnam	2	0	0	0	0	11
Total US patents for invention granted	153486	157495	166037	167333	169028	3583814

Source: US Patent and Trademark Office, Patent Technology Monitoring Division Report, March 2004

Table 3.2 Patents Granted in ASEAN Countries and in Australia

	1993	1998	1999	2000	2001	2002
Australia	**12728**	**14784**	**13528**	**13916**	**13983**	
Philippines	940*	565	648	566	1092*	
Singapore		2291	4410	5090	7220*	
Vietnam	16		490	727		
Thailand	451	723	392*	416*	796*	1102*
Malaysia	1121	567*+	720*+		1470*	
Indonesia	2069*	1846*	2936*	3890*	3926*	

Source: WIPO. WIPO figures are used whenever available.

* national source

+ including utility inventions

It is tempting to conclude that there has been an increase in patenting in several ASEAN countries in recent years, but the figures are too irregular and unreliable to draw even such an elementary conclusion. Occasional data series allow a glimpse of who makes most use of the IPR system in the ASEAN countries. In Malaysia, for example, between 1988 and 2000, 38% of patents were granted to US residents, 21% to residents of Japan, 24% to residents of Europe, and only 3% to residents of other ASEAN countries (S&I International Bangkok Office, *Statistics of Malaysian IPR*). In Thailand between 1992 and 2002, 26% of patents granted were granted to US residents, 26% to Japanese residents, 17% to European, and just 0.3% to residents of other ASEAN countries (S&I International Bangkok Office, *Statistics of Thai IPR*). In Vietnam, 28% of patents granted in 1999 were granted to US residents, and 27% to Japanese residents (S&I International Bangkok Office, *Statistics of Vietnam*).

Table 3.3 shows patents granted in several ASEAN countries to residents and non-residents in 1998 and 1999. Quite clearly, ASEAN residents make almost no use of the monopoly provisions of their own patent systems. This is not necessarily an indication of underdevelopment. As Table 3.4 reveals, most countries award vastly more patents to non-residents than to their own residents. However, there is always a trade-off between the inventiveness of the national economy as reflected in a propensity to patent, and the attraction of its market to patentees elsewhere. Table 3.3 might suggest that ASEAN countries, with the possible exception of Thailand, are either not inventive or that their markets are particularly attractive to patentees. Neither alternative is credible.

Table 3.3. Patents Granted to Residents and Non-Residents in ASEAN Countries and in Australia

	1998			1999		
	resident	non-resident	% resident	resident	non-resident	% resident
Australia	**1398**	**13386**	**9.5**	**1239**	**12289**	**9.2**
Philippines	**6**	**559**	**1.1**	**5**	**643**	**0.8**
Singapore	**30**	**2261**	**1.3**	**48**	**4362**	**1.1**
Vietnam				**13**	**477**	**2.7**
Thailand	**43**	**680**	**5.9**	**29***	**363***	**8.0**
Indonesia	**93***	**1753*#**	**5.3**	**152***	**2784*#**	**5.5**
Malaysia	**193***	**5770***	**3.3**	**218***	**5628***	**3.9**

Source: WIPO. WIPO figures are used whenever available.

* national source

including Patent Co-operation Treaty

Malaysian figures include utility inventions

Table 3.4. Share of Patents Granted to Resident Inventors, 1995

Patent granting country	% residents
Italy	**2.3**
Canada	**8.1**
Mexico	**4.2**
Brazil	**9.7**
United Kingdom	**10.8**
India	**25.7**
France	**27.5**
Germany	**34.8**
South Korea	**52.5**
United States	**55.0**
Russia	**71.4**
Japan	**86.9**

Source: from Lawrence Rausch, *US Inventors Patent Technologies Round the World*, National Science Foundation, Washington DC, NSF 99-329, February 1999.

Of course, patents are not the only form of IPR, and for SMEs probably not the most significant sort. Trademarks, industrial designs and copyright are likely to be more important. Here, though, we encounter even graver statistical problems. If patent statistics in the ASEAN region are unreliable, trademark and industrial design statistics are even more so. Copyright statistics are almost non-existent. Consequently, the foundations on which a better understanding of the IPR situation as it affects SMEs in the ASEAN region are particularly weak.

It is clear from Table 3.5 that there are many more applications for trademarks in the ASEAN countries than there are for patents. It is also clear from the Australian comparator that ASEAN countries are as active as developed countries in trademark registration. And although applications to register trademarks in Singapore have grown rapidly in recent years, Singapore does not dominate in trademarks in the way that it does in patents. Table 3.6 indicates that residents are responsible for a much higher proportion of trademarks than of patents. Thailand has reached Australian levels, though Philippine participation in trademark registration may have plummeted.

Industrial design registration exhibits a not dissimilar pattern. Australian registrations still exceed those of any single ASEAN country, but no longer by much. ASEAN registrations of industrial designs are increasing rapidly (see Table 3.7), whereas Australian registrations are stagnant. Table 3.8 indicates that residents are responsible for most applications for industrial design registrations in ASEAN countries. Proportions in several ASEAN countries are similar to that found in Australia. The exception, once again, is Singapore, where it is evident that use of the system is dominated by foreigners.

Table 3.5. Applications for Trademark Registration in ASEAN Countries and in Australia

	1993	1998	1999	2000	2001	2002	2003
Australia	26127	30173	58789	71496	39052		
Thailand	15439	18409	22439	27077	26119*	30109*	
Singapore	10311	13021	15753	22394	3079	20075*	21287*
Philippines	4526*	9400*	10070	10780	9623*		
Vietnam	9010	2838	6520	8128	2422		
Cambodia	1521*	1609*	1303	2053*	1499		
Indonesia	42026*	23160*	23335*	31675*	38648*	42416*	
Lao PDR			609		577		

Source: WIPO. WIPO figures are used whenever available.

* national source

Table 3.6. Trademark Registrations in ASEAN Countries and in Australia, Residents and Non-Residents

	1994			1999			2001		
	residents	**non-residents**	**% residents**	**residents**	**non-residents**	**% residents**	**residents**	**non-residents**	**% residents**
Australia	7666	8664	46.9	16921	14401	54.0	17072	14172	54.6
Vietnam	1744	5066	25.6	1299	4516	22.3		2117	
Cambodia	3	1415	0.0	82	1140	14.9	246	1520	7.2
Indonesia	12054	5711	67.9						
Thailand	7088	5902	54.6	7230	8481	46.0	16712*+	9407*+	64.0
Lao PDR				33	509	6.1	18	513	3.4
Philippines	909*	2032*	30.9	205	969	17.5	232*	2601*	8.2

Source: WIPO. WIPO figures are used whenever available.

* national source

+ trademark applications rather than registrations

Table 3.7. Applications to Register Industrial Designs in ASEAN Countries and in Australia

	1994	1995	1996	1997	1998	1999	2000	2001
Australia	4348	4045	4415	4207	4105	4371	4255	4119
Philippines	595*	497*	839	878	726	767	819	393*
Thailand	962	904*	960	1148	1338	1721*	2697	2662*
Vietnam	716	1131	1646	1153	1057*	1036	1207	
Indonesia								1403*

Source: WIPO. WIPO figures are used whenever available.

* national source

Table 3.8. Applications to Register Industrial Designs in ASEAN Countries and in Australia, Residents and Non-Residents

		Australia	Philippines	Thailand	Vietnam	Indonesia	Singapore
1998	resident	2703	99	789	933*		
	total	4105	326	1338	1057*		
	%	65.8	68.8	59.0	88.3		
1999	resident	2959	515	1148*	899		
	total	4371	767	1721*	1036		
	%	67.7	67.1	66.7	86.8		
2000	resident	2674	479	1939	1110		
	total	4255	819	2697	1207		
	%	62.8	59.5	71.9	92.0		
2001	resident		152*	1970*		1092*	231*
	total	4119	393*	2662*		1403*	1597*
	%		38.7	74.0		87.8	14.5
2002	resident						241*
	total						1701*
	%						14.2
2003	resident			2415*		2496*	481*
	total			3237*		2868*	2120*

	%	74.6	87.0	22.7
2004 (Jan- July)	resident		2313*	
	total		2591*	
	%		89.3	

Source: WIPO. WIPO figures are used whenever available.

*national source

Because Singapore is outstanding among ASEAN nations in IPR activity, it might be assumed that Singapore is a hub for ASEAN IPR, attracting applications from throughout the ASEAN region. In fact, it is no such thing. As Tables 3.9, 3.10 and 3.11 show, other Asian countries, and especially Japan, are much more likely to be active in registering their IPR in Singapore than ASEAN countries. The only significant ASEAN activity in Singapore is the registration of trademarks.

Table 3.9: Patent Applications Filed in Singapore, 2002-3

ASEAN	**2002**	**2003**
Brunei	0	0
Indonesia	3	1
Malaysia	6	16
Philippines	0	3
Singapore	632	626
Thailand	3	3
Vietnam	0	0
Selected Other ASIAN		
Hong Kong SAR	17	7
Japan	1582	1271
Republic of Korea	101	63
Taiwan	73	137
All Countries	*8070*	*7908*

Source: Intellectual Property Office, Singapore, 2003/4

Table 3.10: Trademark Registrations in Singapore, 2002-3

ASEAN	**2002**	**2003**
Brunei	6	7
Indonesia	50	83
Malaysia	319	292
Philippines	2	10
Singapore	3344	4254
Thailand	84	89
Vietnam	13	20
Selected Other ASIAN		
Hong Kong SAR	289	205
Japan	1719	1859
Republic of Korea	129	175
Taiwan	275	226
All Countries	*20075*	*21286*

Source: Intellectual Property Office, Singapore, 2003/4

Table 3.11: Industrial Design Registrations Filed in Singapore, 2002-3

ASEAN	**2002**	**2003**
Brunei	0	0
Indonesia	3	4
Malaysia	12	22
Philippines	0	3
Singapore	241	481
Thailand	0	3
Vietnam	0	0
Selected Other ASIAN		
Hong Kong SAR	40	32
Japan	567	679
Republic of Korea	9	7
Taiwan	85	14
All Countries	1701	2120

Source: Intellectual Property Office, Singapore, 2003/4

D. SME POLICIES IN THE ASEAN REGION

SMEs account for over 90% of all private sector firms within ASEAN and employ between 75 and 90% of all domestic workers across member countries. Differences in definitions of a SME, and consequently in national data collections, make comparisons difficult. However, there are some general observations that can be made about the contributions of SMEs to ASEAN economies:

- ASEAN SMEs contribute primarily to local markets with only a small proportion involved in export markets;
- SME exports are concentrated in a narrow range of low value-added products, principally food products, handicrafts, textiles, furniture, wood products, and leather goods; and
- ASEAN SMEs tend to be owned by families and founding entrepreneurs.

In many industrialised economies, SMEs are crucial sources of innovative ideas, products and services. Their relationships with larger firms are essential to a dynamic economy. Business networks and industrial clusters are an evident part of this activity. However, there is an industrial weakness in ASEAN economies in that they lack mid-size enterprises (Asasen and Asasen, 2003). Particularly in the newer member countries this remains a major barrier for development.

In **Indonesia**, before the 1997 economic crisis, almost two-thirds of small business were in the agricultural sector, over 17% in trading (including restaurants and hotels), over 7% in processing industries, 5% in the service sector, 2.5% in consultancy and 4% in other sectors (Dhungana, 2003). SMEs may account for more than 90% of all the companies in Indonesia, but their share in the Indonesian economy is insignificant. Some 80% of GDP is produced by large corporations. SMEs account for 70% of employment in the industrial sector in **Thailand,** and 4.7% of total manufacturing value added. About 98% of establishments in the manufacturing sector in Thailand are SMEs. The main industries dominated by SMEs include metal and steel, plastic products, rubber and garments.

Through the 1970s and 1980s, **Singapore** recognised the inherent technological limitations of its domestic firms (largely SMEs) and encouraged technological upgrading and restructuring that focused on large foreign firms in appropriate industries. Semiconductor manufacturing and software have benefited from government policy that explicitly targets sectors seen as strategic to the economy. In addition to encouraging investment by foreign firms, policy has also been directed towards modernisation of the indigenous sector through the Local Industry Upgrading Programme, which is intended to increase the rate of technology transfer to locally-owned firms. Singapore has no statistics specifically for SMEs, but it is estimated that SMEs account for over 40% of manufacturing production and over 25% of value added in manufacturing.

SMEs in **Malaysia,** defined as companies having paid-up capital of less than M$25 million with not more than 150 full-time employees, are primarily involved in manufacturing, engineering and printing. SMEs contribute almost 30% of total output, 17.6% of value added, and 17.5% of employment in the manufacturing sector. Only 20% of SMEs export. With policy similar to that of Singapore, the Malaysian government has tried to promote technological advance in indigenous firms that belong to subcontracting networks centred on foreign firms (largely from Japan or East Asian NICs) that have manufacturing operations in Malaysia. Through *keiretsu*-like structures, Malaysian SMEs are meant to gain resources to upgrade their technological skills and reduce Malaysia's high level of dependence on labour-intensive operations. A cluster in Penang, built on disk-drive firms that had migrated from Singapore, has been viewed as especially successful.

In the **Philippines**, SMEs account for 99% of all enterprises, 45% of employment and 28% of value added in the manufacturing sector. Under the leadership of the Department of Trade and Industry (DTI), the Arroyo Administration adopted the National Small and Medium Enterprises Development Plan (NSMEDP). It aimed to provide a comprehensive and integrated strategy for the development and competitiveness of SMEs. Specifically, the NSMEDP sought to provide a strong domestic supply base for globally-competitive SMEs, better access to government services, and supply-side push through liberal financing arrangements.

The key challenges for the development of SMEs in ASEAN can be summarised as follows (Asasen and Asasen, 2003):

- building human resource capabilities, particularly in business management and entreprenourship;
- building on links with public-sector agencies to establish internal business capabilities;
- gaining access to financial resources;
- gaining access to information about markets and business opportunities;
- establishing networks or clusters to consolidate SMEs in key niches along the value chain in value-adding industry sectors; and
- enhancing technological capability.

Most countries have introduced policy measures to meet these challenges. For example, soft loans and technological assistance is provided in the **Philippines** based on the size of the enterprise. In general, SMEs enjoy statutory privileges not enjoyed by larger firms. Concerted efforts are being made in **Thailand** to support SMEs through: (a) strengthening technological and management capabilities; (b) developing skills and knowledge; (c) enhancing market accessibility; (d) strengthening the financial support system; (e) establishing a conducive business environment; (f) commercialisation and incubation programmes; and (g) developing networks and clusters. The Department of Industrial Promotion of Thailand encourages entrepreneurs to set up SME associations to foster cooperation among SMEs, and to provide training courses and joint venture promotion. A SME Promotion Fund can be used for lending to SMEs and for funding the SME projects of government departments, other government agencies, state enterprises and private sector organisations. In **Indonesia**, a number of Technical Service Units were established to enhance the technological capability of SMEs. These units have been established to build closer links between public and private sector enterprises, to promote innovation, and to raise the technological capability of SMEs, particularly in small-scale industrial estates.

These challenges are not unique to ASEAN. SMEs in other parts of Asia have confronted similar issues and constraints. **Taiwan** has established a comprehensive assistance system encompassing financing, management, production technology, research and development, information management, industrial safety, pollution prevention, and marketing. It has also organised a credit guarantee fund for SMEs. In the **Republic of Korea**, SME policies have focused on fostering competitiveness, accelerating the shift towards a more sophisticated and value-added industrial structure through automation, and providing assistance for technology development and quality improvement. SMEs have been encouraged to form cooperative ties with large companies to enhance their competitiveness at home and abroad. Short-term policies have focused on ensuring stability for SMEs in, for example, access to credit, particularly in the wake of the financial crisis. In addition, sanctions against unfair transaction practices between large companies and SMEs have been strengthened. SME policies also place emphasis on promoting exports.

The manufacturing sector in **Hong Kong** is still dominated by low-technology industries, such as textiles. As both labour and land costs in Hong Kong have increased, locally-based manufacturing activities have been priced out of the market. Instead, a number of Hong Kong concerns have become ‘hollow’ firms, which maintain their administrative and development activities in Hong Kong, but have transferred their factories further afield, primarily into adjacent parts of China. On the other hand, there has been substantial upgrading in the consumer electronics industry as a number of Hong Kong firms have switched from sole reliance on original equipment manufacture (OEM) contracts to export their own brands.

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IV. IPR AND SMES IN THE ASEAN CONTEXT

A. PHILIPPINES CASE STUDY

As no ASEAN country collects IPR statistics on SMEs, the project team chose an ASEAN country case study to explore in detail a sample of applications for IPRs. The Philippines was chosen for this laborious exercise as the project team had comparatively ready access to data. There were two objectives for the case study: (1) to assess the level of difficulty in collecting and reviewing such data, and (2) to gain a general overview of IPR relevance for SMEs in different industries. SMEs contribute 68.3% of total jobs generated by all types of business establishments in the Philippines (Yushita, 1996). More than 90% of all enterprises are SMEs, accounting for approximately 20% of total output (Salazar,1996).

Sampling of applications filed with the Intellectual Property Office indicates that very few SMEs apply for IPRs. Most patent and trademark applications are from large multinationals. However, many industrial design applications are made by individuals rather than by firms, and Filipinos predominate here. In some cases, the inventor of an industrial design is employed by a company which uses the industrial design and reaches an informal arrangement with the inventor (Ancog, 2004). Interviews were also conducted with a small sample of SME representatives and technology support agencies. In summary, these interviews found that locally-developed tools and equipment transferred by government to assist SMEs are often modified and improved by the SMEs. Although such modifications support SME competitiveness, they are not necessarily covered by IPR.

The most common mode of technology transfer from foreign companies to SMEs in the Philippines is through suppliers of machinery and equipment. This is particularly prevalent among SMEs in the metal working industry. In the garment industry, the most important mode of technology transfer to SMEs is through subcontracting arrangements, where the mother company gives local subcontractors guidelines on the use of sewing machines for a given product, and specifies quality requirements. In the food industry, SMEs acquire technology through learning-by-doing. In most instances, the mother company in a subcontracting arrangement is simply a provider of raw materials and marketing information rather than technology (Patalinghug, 2003).

Generally for SMEs, patents and industrial designs are not perceived as important for success in business. For instance, in the manufacturing and marketing of houseware, gifts, accessories, and even furniture (where design must respond to consumer preferences and is always short term), SMEs prefer to go into production without IPR so that they can capture a market quickly. IPR cannot be acquired in less than 12 months, and entrepreneurs choose to devote their energies to scouting for markets, and enhancing their products to meet consumer demand before competitors can copy their products. Regional data indicate that most SMEs are either unaware of IPR opportunities, or are reluctant to secure IPR protection because of the costs and bureaucratic burden of registering IPRs.

> Based on experiences in dealing with SME owners, IPR is not their main concern but rather what technologies can be accessed and how the technologies can assist productivity. (Regional Director of Department of Science and Technology (DOST), Cebu City, September, 2004)

There appears to be consensus among regional directors of DOST that there is minimal awareness of the value of IPR among SMEs. IPR registration is not perceived as a priority. The main policy concern is providing SMEs with technologies that can be put to use in production and manufacturing processes to enhance productivity, expand the market and capture niches in the market. Firms are vying for the same markets and time spent on IPR applications is time not available for business activities. While trademarks are perceived by some SMEs to be crucial in gaining a foothold in their markets, the perception of the application process as long and tiresome is an obstacle to greater use of their IPR.

Box 7: Pharmaceuticals in the Philippines

Altermed is a subsidiary enterprise of Pascual Laboratories, a pharmaceutical company in the Philippines. It is a medium-sized firm which adopted herbal medicine technologies developed by Filipino scientists involved in the government's traditional medicine research and development programme. Altermed manufactures *lagundi,* an anti-asthma medicine, and *sambong,* which is a diuretic and a remedy for urolithiasis. Pascual Laboratories is headed by Abraham Pascual, a risk-taker who has strong entrepreneurial skills, and is achievement-oriented. Furthermore, he is well informed about indigenous pharmaceutical products and visits other countries to observe and learn about pharmaceutical developments. He supports the commercialisation of Filipino technologies and feels that there is a market for high-quality medicines developed from local raw materials.

The Assistance to Inventors' Program of the Technology Application and Promotion Institute (TAPI) of DOST provides help in documenting inventions, filing of applications for patents, utility models or industrial design, technical advice concerning loans with liberal terms from the Development Bank of the Philippines, endorsement of qualified inventors for exemptions from duties, and modest grants for the commercialisation of inventions. The agency's experience confirms the need for a close link between IPR actions, business strategy and other forms of SME support.

Box 8: The Patenting Process and Manufacturing Confidence

Engineer Jesselito V. Baring, is a chemical engineer and inventor of the Rotating Biological Contactor. This invention was one of the finalists in National Inventors' Week in the Invention Commercialization Award Category in 1998. The device makes wastewater treatment flexible and is capable of treating biologically degradable solvents, oil, seepage and other organic materials. TAPI provided a loan to enable him to finance his machine shop equipment, and purchase materials to produce additional units. Baring believes that patenting his invention was important in that it gave him confidence that his industrial product has passed the tests required for a patentable invention. On the other hand, he admits that very few of his colleagues who are inventors apply for a patent because of the cost of registration and the waiting period before the patent is approved.

B. IPR AND TECHNOLOGY TRANSFER

A major purpose of intellectual property rights – some would say the only purpose - is to prevent others appropriating intellectual property without the consent of the owners of the IPR. Appropriation takes the form of copying, piracy, passing off and counterfeiting. The argument is that the incentive to create is reduced if the creator cannot appropriate the product of his creativity. In consequence, the economy is less innovative, and so less competitive, and so less prosperous. However, this may be an argument more suited to strategic decisions to invest in industrial R&D rather than to the human urge to be creative. Consider Macaulay's nice observation on the impact of copyright on Dr Johnson's productivity:

> Would it have stimulated his exertions? Would it have once drawn him out of his bed before noon? Would it have once cheered him under a fit of the spleen? Would it have induced him to give us one more allegory, one more life of a poet, one more imitation of Juvenal? (Anon, 1978)

It seems relevant to observe that innovation in SMEs generally takes place outside the IPR system. And if the IPR system is marginal to SME innovation, it follows that erosion of IPR by copying will hardly reduce the incentive of SMEs to be creative. Indeed, the IPR system can easily become a barrier to creativity. It is not surprising then that the most enterprising SMEs should seek ways to overcome this barrier. And it is not really surprising that copying should be prominent among these ways. While the IPR system may demand absolute novelty, innovation is simply what is new to the adopter. Thus, copying is essential for nearly all innovation; otherwise, the wheel would have to be invented again, and again, and again.

Even if it is accepted that the IPR system is indeed an obstacle to inventiveness in the SME, it can still be argued that the system facilitates technology transfer to the SME, and hence stimulates its innovation. It is argued that the SME has only to consult the various IPR databases to find out what new technology is available, and has then but to take out a licence from whoever owns the IPR to use the new technology quite legally. But there are problems with this argument too. One limitation of the IPR system is that, while it is a repository of information about innovation, it tends to collect this information for its own purposes rather than those of firms (Macdonald and Lefang, 1997). The inexperienced, in which category most SMEs reside, have particular trouble finding patent information and then using what they find to innovate (Arundel and Steinmuller, 1998). Of course, technology transfer is not supposed to be accomplished by licence alone; the licensor must go to great lengths if technology is to be transferred successfully to the licensee, often sending individuals knowledgeable in the art to convey tacit information. This is not the sort of hand-holding that can generally be afforded by individual SMEs, even though SMEs are the very organisations that require the most assistance.

In short, the IPR system is unlikely to be an efficient means by which technology is transferred to SMEs. This may be why they sometimes disregard it in their copying. On the face of it, such copying is a cost to the owner of the IPR. But owners of IPR can also benefit from copying. New products usually have no market until one is created, a process in which copying can be an effective mechanism. In the case of fashion products, where demand tends to be related to demand itself rather than to price, copying may boost sales of a whole range of both exclusive and popular fashion products. Though they may benefit from copying, those whose IPR has been infringed by copying still tend to complain, often observing that stricter regulation is required and that compensation would be in order. Yet, cases in which the market is confused between the copy and the genuine article are probably the exception. For most goods, there is clear product differentiation and market segmentation. The copied goods produced by the SMEs of ASEAN are unlikely to be taken for the real thing; those who own the IPR do not usually claim that the fake is as good as the genuine article. They insist instead that their market is being eroded. Yet, the market that pays a few dollars for copied goods is usually quite distinct from the market that pays a few hundred dollars. What copying

does do, though, is allow SMEs to establish a basic competence through technology transfer on which they can build with their own innovation – something at which SMEs are inherently good.

Box 9: Copying and Adaptation

SMEs in East Java now produce good quality leatherware. At one time, they simply copied Western designs. Their employees would watch the carousels at the airport, waiting for examples of the latest designs from the most fashionable designers. They made exact imitations, copying the brand name too. After warnings from the Indonesian government, they changed their brands so that these merely resembled fashionable brands. They have now begun to adapt the designs as well, and with change in design, they have also begun to use their own brand names.

Though TRIPS is supposed to bring benefits to the developing world in terms of technology transfer, it is hard to see how these benefits are to be realised by the SMEs of the developing world. Just how, in practice, does the IPR system assist the transfer of new technology from, say, a large American firm, to an Indonesian SME? Probably the only practical way by which the SME can acquire new technology is by copying. Even were the SME to take out a licence, it could hardly expect individual support from the IPR holder and would probably still have to resort to copying to secure technology transfer.

Copying has long played an important and not dishonourable part in technology transfer. It was probably the major means by which the innovation of the agricultural and then the industrial revolutions of the 18th and 19th centuries spread from Britain to Continental Europe (Macdonald, 1993). Then, British firms often welcomed imitators, arguing both that copying extended their market and that their rate of innovation outpaced the rate at which copies could be made. Indeed, copying was seen as not just the means by which innovation could be brought about through technology transfer, but also the means by which new innovation would be stimulated in firms that had been copied. This is reminiscent of the style of thinking in modern SMEs: it is very different from the thinking in many large companies. The modern manager is trained to value information as a fundamental resource. The logic is that something so valuable should be owned by the organisation and suitably guarded so that it is not seized by others. The IPR regime, as an instrument of knowledge management, is seen as having an important role to play here (Macdonald, 2004).

The irony is that many of the countries now so strident in defending the IPR of their own companies, and in attacking infringement by foreign companies, were once themselves guilty of allowing their own firms to copy and to infringe the IPR of others (see Asasen and Asasen, 2003). These countries permitted their nationals to disregard foreign IPR throughout most of the 19th century, and often allowed their citizens to claim foreign IPR as their own (Chang, 2002). As long as technology elsewhere was more advanced, it seemed sensible to focus on its acquisition and IPR was seen as an obstacle, not an aid, to this acquisition. Only once these countries had acquired a technological infrastructure, in part through illicit copying, did they become interested in exploiting IPR to deter the copying of others. The US did not acknowledge foreign copyright until 1891. It was pressure from the more developed countries that resulted in the Paris Convention of 1883 on patents and the Berne Convention of 1886 on copyright, both declaring that signatories must provide the same IPR as they offered their own citizens. It is important to appreciate how new is this switch in policy. Pharmaceutical firms may insist that patents are essential to their survival, but many developed countries did not allow the patenting of pharmaceutical inventions until very recently: France in 1960, Ireland in 1964, Germany in 1968, Japan in 1976, Switzerland in 1977, Italy and Sweden in 1987, and Spain in 1992 (Dutfield and Suthersanen, 2005).

Some observers have detected more than a whiff of hypocrisy in the current attitude of the developed world to the use of IPR to transfer technology to the developing world (e.g., Dutfield and Suthersanen, 2005). Having found IPR a hindrance to their own acquisition of new technology, developed countries now declare that the IPR system will actually assist technology transfer to the countries that are currently developing. Having copied themselves to acquire new technology in defiance of IPR, they seem determined that the modern developing world will not take the same course to development. The harmonisation offered by TRIPS may prove to be an obstacle to the discretionary application of IPR that has been fundamental to the development of those very countries. The demonisation of copying reflects an attitude to innovation more appropriate to the R&D programmes of large, high technology companies from the developed world (Kingston, 2004): it ill suits the methods of technology transfer upon which ASEAN SMEs depend for their innovation and competitiveness (see Turner, 1998). Take, for example, the attitude of Singapore Microsoft to software piracy:

> You might think software theft hurts only those of us who create software, but the truth is, the damage goes much further, impacting jobs, wages, taxes, and retail sales right in your community [sic]. …And, as more software is produced, more is pirated each year. It is simply wrong…. Let's work together to reduce piracy and its harm to us all. (www.microsoft.com/singapore/mssg_docs/1839.aspx, accessed December 2004).

But maintaining competitiveness through preventing technology transfer and restricting the flow of information, as the United States has attempted with export controls since the 1980s (Macdonald, 1990), is fundamentally different from maintaining competitiveness through innovation. Copying is endemic in many developing countries. It is especially prevalent among the SMEs of these countries, but also extends to large organisations and to government departments, sometimes even those responsible for administering IPR. As a means of technology transfer, it has much to recommend it and might be openly espoused – as it was by the Japanese after World War II – were it not for the need to see the IPR system as preventing this sort of activity (see Spero, 1990). As long as the IPR system is intended to facilitate technology transfer, it is hard to be critical of copying by ASEAN SMEs.

C. SUMMARY OF FINDINGS

It is difficult to gain insights into the performance of SMEs and their use of IPR from existing databases. Similarly, it is difficult to view the position of SMEs across different manufacturing sectors and their use of different forms of IPR. Nevertheless, there is evidence that much can be done to align IPR systems with national development strategies for SME development. It is important to note, however, that given the diversity of firms and levels of industry development across ASEAN, the evidence strongly points to the reality that there is no single solution for all SMEs.

The evidence drawn from the literature and our survey of firms and agencies in ASEAN and elsewhere draws attention to the varying levels of importance of different forms of IPR for SMEs in different countries and in different industrial contexts. For example, Japan and Korea are extremely active in patenting in the region. Their patenting is dominated by large firms, but a consequence is that many SMEs are part of their industrial value chain. It is a business necessity for many of these SMEs that they are also engaged in IPR activity through licensing and other formal arrangements.

In many ASEAN countries, SMEs are simply not in this game. Their competitiveness relies on business strategy, deft marketing and building strategically on niche opportunities. For this group of firms, long term sustainability requires building on core competencies and establishing longer-term business strategies rather than responding simply to short-term opportunities. For this category of firms, the trademark can be a useful tool. Although the

available data are patchy, analysis points to notable differences between countries that make greater use of trademarks and those making less use of trademarks.

Box 10: Assessing the Cost

This case is of an SME employing 13 people and manufacturing equipment for treating water. Its owner-manager previously worked for a bigger company and knows about trademarks from this experience. Consequently, he had registered trademarks for his own company. He estimated that it cost about $US1,000 to register a trademark in Indonesia, a cost he could ill-afford, and that was generally beyond the means of Indonesian SMEs. He had no interest in any other form of IPR, and made no use at all of the information available from the IPR system.

If the IPR system is to enhance the competitiveness of SMEs in ASEAN, action is required in five key areas.

1. There is a need for more user friendly information about IPR. This needs to be presented in the context of current and potential firm strategy and business plans.
2. There is a need to involve industry associations/professional bodies in preparing and disseminating such information.
3. There is a need to generate confidence among SME managers in (a) the *value* of IPR for their business strategy, and (b) the capacity of the system to protect their IPR.
4. In preparing and providing information and advice for SMEs on IPR issues, there is a need to focus on the role of SMEs in the value chain and in industrial clusters and networks in order to identify where and when they can most benefit from different forms of IPR.
5. There is a need to develop a regional database on the current uptake of IPR by SMEs and the sectors and types of business activity in which they are most engaged.

In the following chapter, recommendations are outlined as a starting point for responding to these needs. Some of these are directed toward a regional ASEAN response, some toward national IP offices, and others toward SMEs themselves.

V. RECOMMENDATIONS FOR ASEAN

The following recommendations are aimed at overcoming some of the difficulties that ASEAN SMEs confront in using IPR in order to enhance their competitiveness. SMEs are not a homogenous group; they vary widely, as do their industries and the circumstances in which they find themselves. Such diversity must always mean that there can be no single IPR route to innovation and enhanced competitiveness for ASEAN SMEs. It is important to remember that much of the economic value of SMEs lies in their diversity. IPR must not be used as a mould to press SMEs into uniformity, no matter how much policy may be concerned with pushing SMEs into growth, internationalisation or high technology.

The analysis presented in this report carries the underlying message that the vast majority of SMEs currently makes little use of IPR. However, this does not mean the IPR system cannot contribute to their competitiveness. Indeed, given the growing importance of IPR in the rest of the world, it is doubtful whether ASEAN SMEs have the option of remaining passive in IPR matters. The recommendations offered in his report take this observation as a starting point. They are directed toward different agencies and have different time frames. Most recommendations are framed with a view to aligning IPR more closely with SME business strategies. While a key role is identified for ASEAN and national governments in these recommendations, they are likely to bear fruit only if professional and business associations are closely involved.

Recommendation 1

Problem: SME managers know very little about how to use IPR.

Solution: Education in the business use of IPR

SMEs in the ASEAN region need information about how they might use the IPR system both for their own IPR and to exploit legally that of others. Education should be provided by groups with interests in the development of SMEs rather than IPR. The former are likely to see the problem from the perspective of SMEs: the latter from the perspective of the IPR world.

Information about the use of IPR should be provided in the context of innovation and competitiveness, and should emphasise how IPR can fit with SME business plans, when resort should and should not be made to IPR, what reliance to put on IPR, what sort of IPR to register (see Recommendation 2 below). ASEAN governments already have programmes in place to assist the development of SMEs, and this initiative should form part of these programmes. The information should focus on trademarks, industrial designs and copyright, rather than on patents, and should exploit case studies that demonstrate successful and failed exploitation of IPR. Use should be made of a wide variety of dissemination mechanisms: seminars, workshops, leaflets, websites, campaigns, information kits, business magazines, fairs, conferences, radio and TV.

Timescale: immediate

Funding: national governments

Responsibility: national departments of trade and industry

Recommendation 2

Problem: Limited capacity among SMEs to assess how IPR can fit into their business plans.

Solution: Development of an IPR assessment system, modelled on the Danish IPscore, and appropriate for SMEs; adapting this simplified IPscore for use with industrial designs; and adapting further this simplified IPscore for use with trademarks.

Denmark is a small firm economy whose government has long been concerned with increasing competitiveness through innovation. Because the Danish experience seemed pertinent to the current concerns of the ASEAN Secretariat, considerable effort has been expended examining Danish practices. While the Danish Patent and Trademark Office is exceptionally enterprising, contracting out various of its services to other patent offices, it is no part of Danish policy to make the IPR system central to SME innovation. It is appreciated that IPR has an important part to play, but only a part, and that to emphasise this part would be to risk distorting the role of IPR in SME innovation. To this end, the Danish Patent and Trademark Office stresses the business strategy in which IPR might play a role.

> The purpose is to contribute to improving Danish companies' opportunities to capitalise, use and report their intangible rights as an element of their overall business strategy …. some companies have a patent and trademark strategy, but …. very few systematically link this strategy with their general business strategy. (Danish Patent and Trademark Office, 2001).

More particularly, the Danish Patent and Trademark Office has developed IPscore, an interactive computer programme to help managers judge where a specific patent might fit in the overall strategy of a business. We have investigated this system and are impressed (see Nielsen, 2004). It sells for about €2000 in Denmark (about €3600 to foreign customers), and has been bought by large firms, national patent offices, and patent attorneys. The European Patent Office is currently considering making it available throughout the European Union, and making its application standard practice.

In its current form, IPscore is too complicated for SMEs. In any case, the patent is rarely used by ASEAN SMEs. However, IPscore does impress on its users that strategy, rather than patents, must be central to innovation. Its value lies in requiring the user to ask the right questions rather than in the user being able to answer these questions. For this reason, we recommend the purchase of IPscore by national patent offices in ASEAN so that patent officials might become more familiar with the importance of business strategy in the exploitation of IPR. We further recommend, probably in collaboration with the Danish Patent and Trademark Office:

- development of a much simplified IPscore appropriate for SMEs
- adapting this simplified IPscore for use with industrial designs
- adapting further this simplified IPscore for use with trademarks.

Timescale: medium term

Funding: ASEAN Secretariat then ASEAN Patent Office

Responsibility: ASEAN Secretariat/Patent Office then national governments

Recommendation 3

Problem: SME managers find applying for IPR confusing.

Solution: Simplification of the IPR application system for SMEs.

A hand-holding operation is necessary to make application for national IPR in the ASEAN countries as quick and simple as possible, and to explain to ASEAN SMEs the different procedures required by overseas IPR regimes, the Patent Co-operation Treaty (for patents), the Madrid System (for trademarks) and the Hague System (for industrial designs).

Timescale: immediate

Funding: national governments

Responsibility: national patent offices

Recommendation 4

Problem: SME managers make almost no use of the information publicly available in the IPR system.

Solution: Establish an IPR Information Service.

Effective means must be found to enable SMEs to use the information available in the IPR system. Existing IPR databases are designed to serve the information requirements of IPR professionals, which are quite different from the information requirements of SME managers. An intermediary is required between SME managers and IPR data bases. Appropriate intermediaries will have a background in SMEs rather than in patent offices, and the service should not be located in patent offices. The service should be subsidised by national patent offices on the grounds that the public has already paid for IPR information. The cost of customising the information should be paid by SME managers using the service.

Timescale: medium term

Funding: national patent offices and SMEs using the service

Responsibility: national departments of trade and industry

Recommendation 5

Problem: Legislation, regulation and enforcement vary within the ASEAN region, leading to confusion amongst those least familiar with the IPR system, especially SMEs. SMEs are least able to afford expert advice to understand the differences and their implications.

Solution: Revive plans for an ASEAN Patent Office.

An ASEAN Patent Office along the lines of the European Patent Office in Munich would provide benefits for the region. While single IPR for the region would not be an immediate aim, reconciliation of national differences would be, as would the development of compatible IPR policy and practice in the region.

Timescale: long term

Funding: ASEAN Secretariat

Responsibility: ASEAN Secretariat

Recommendation 6

Problem: IPRs are too expensive for SMEs.

Solution: Reduce the cost for SMEs of applying for, and maintaining, IPR.

The Singapore government already subsidises IPR application by its national SMEs, as does the government of South Korea. Many countries contribute to the costs of their SMEs applying for IPR overseas. An ASEAN fund, composed of levies on overseas firms patenting in the ASEAN region, might be established to subsidise SME applications for IPR in the ASEAN region and elsewhere.

Timescale: medium term

Funding: foreign firms with IPR in the ASEAN region

Responsibility: ASEAN Patent Office

Recommendation 7

Problem: SMEs lack the resources to defend their IPR. Unable to depend on their IPR, they are reluctant to use the system.

Solution: Assure SMEs that the value of their IPR can be protected. This can be achieved by:

1) providing greater clarity in what administrative penalties will be enforced against those who infringe IPR, and greater certainty in the enforcement of these penalties.

2) forming an ASEAN body to take action in selected cases where the IPR of ASEAN SMEs has been infringed. Action by such a body will help discourage others from infringing the IPR of SMEs in the region. Such a system is simpler and probably more effective than the various insurance schemes currently being considered elsewhere in the world.

Timescale: immediate

Funding: ASEAN Secretariat and national governments

Responsibility: ASEAN Secretariat and national governments

Recommendation 8

Problem: While there is considerable interest in the region in helping SMEs deal with IPR, little is heard from SMEs themselves.

Solution: Pressure groups concerned with expressing the interests of ASEAN SMEs in IPR. Pressure groups with a specific interest in the IPR issues that most affect SMEs should be encouraged. Such groups would help balance the influence currently exerted by pressure groups representing other IPR interests. The ACID (Anti Copying in Design) group in the UK, with some 800 members, is an excellent model for SMEs.

Timescale: medium term

Funding: ASEAN Secretariat

Responsibility: ASEAN Secretariat

Recommendation 9

Problem: There is no consistent series of IPR statistics for the ASEAN region. There is not even a common definition of a SME. Existing statistics take no account of the particular IPR behaviour of SMEs. Without IPR statistics that relate specifically to SMEs, it is difficult to gauge what use SMEs are making of the IPR system, and what changes in usage occur in response to new incentives.

Solution: Ensure that the ASEAN region has timely, reliable and compatible IPR data. Collection of compatible statistics will be aided by the new ASEAN Patent Office, but an initiative to measure the IPR behaviour of SMEs is urgent and should not await the establishment of the ASEAN Patent Office. A working party consisting of members from all the region's patent offices should be appointed as soon as possible to decide what data are available, what data should be available, and to make arrangements for their collection and publication.

Timescale: short to medium term

Funding: ASEAN Secretariat then ASEAN Patent Office

Responsibility: ASEAN Secretariat then national governments.

Recommendation 10

Problem: There is considerable diversity across ASEAN economies and it is difficult to develop a general strategy for IPR in support of SME competitiveness

Solution: Establish a priority strategy based on priority sectors for integration .

ASEAN discussions and moves toward building an ASEAN Economic Community have drawn attention to the level of industrial diversity within the region. One of the strategies for establishing economic integration has been to identify a set of eleven priority sectors. While these are not targeted specifically as sectors for development, they are areas with strong potential to drive economic integration. It is instructive to consider each of these areas and the potential of various forms of IPR to contribute to SME activity within each sector. These are set out in the following table. Interests in economic sectors, and thus in forms of IPR, will vary among countries. For example, trademarks might be crucial in developing competitiveness in air travel and tourism. On the other hand, patents are likely to be of more relevance in electronics and automotive assembly.

Table 5.1 Priority Sectors for Integration and Potential IPR Strategy

Priority sector for integration	Priority target IPR categories	Countries targeted (examples only)
Wood-based products	Designs/trademarks	Indonesia/Myanmar/Thailand/Lao PDR
Automotive	Patents/designs	Thailand/Vietnam
Rubber-based products	Trademarks/designs/patents	Malaysia
Textiles and clothing	Designs/Trademarks	Indonesia/Vietnam/Cambodia
Agro-products	Trademarks/ patents	Thailand/ Malaysia/Philippines

Fish	Trademarks	Vietnam,/Thailand
Electronics	Patents/ designs/trademarks	Singapore/Malaysia
e-ASEAN	Trademarks	Singapore/Brunei
Health care	Patent/ trademarks	Philippines/Singapore
Air travel	Trademarks	Thailand/Indonesia/Singapore
Tourism	Trademarks	Thailand/Indonesia/Singapore

Timescale: medium term

Funding: ASEAN Secretariat

Responsibility: ASEAN Secretariat

There are two additional areas where further research could help align the IPR system with SME business strategies. The first concerns the role of SMEs in the value chain. Targeted case studies would shed additional light on how IPR can increase technological capacity through intangible benefits that might flow to SME suppliers along the chain. The second area concerns the delivery of IPR information to SMEs. If the recommendations made in this report are acted upon, it will be important to monitor the impact of these initiatives. One way of doing this would be to develop a sample of SMEs that become involved in these initiatives. Surveys of these SMEs might relate their particular characteristics to their ability to use IPR in their business strategy, and hence to use IPR to increase their competitiveness.

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APPENDICES

APPENDIX 1. SURVEY GUIDING QUESTIONS

Questions explored with IP Office Officials

1. What form of IP is most appropriate for SMEs?
   (*Explore why*).

2. What form of IPR protection do SMEs most utilise?

3. What are their expectations?

4. What might be done to further the integration of national IPR systems.?

5. What might be done to further the integration of national IPR systems within ASEAN?

6. Has IPR utilisation by SMEs changed over the past 7-8 years? (ie Post TRIPs and East Asia financial crisis)?

7. Does your agency engage other organisations to carry out the searching functions on your behalf or do you carry out searching functions for others elsewhere?

8. How does your office gain insights and information about business and business and strategy?

9. What policy measures would you propose for ensuring better value for SMEs seeking to gain protection of IP assets?

10. Would an ASEAN patent office be of benefit to SMEs?

Questions explored with industry and trade officials or representatives.

11. What are the main benefits for SMEs derived from the IPR system?

12. What are the barriers to achieving benefit?

13. How do SMEs generally get access to information about the IPR system?

14. Are you aware of any stories where SMEs have successfully (or unsuccessfully) exploited their IP assets?

15. To what extent and how has IPR regulation and management contributed to increases in (a) collaboration between SMEs and larger firms and (b) cross border cooperation?

16. What policy measures would you propose for ensuring better value for SMEs seeking to use the IPR system?

17. What impact has TRIPs had on the IPR system in your country?

Questions explored with SME Associations or Chambers of Commerce

18. What are the main benefits for SMEs derived from IPR system?

19. What are the barriers in achieving benefit?

20. Are you aware of any stories where SMEs have successfully (or unsuccessfully) exploited their IP assets?

21. To what extent and how has IPR regulation and management contributed to increases in (a) collaboration between SMEs and larger firms; and (b) cross border cooperation?

22. What needs to change to enable SMEs derive better value from the IPR system?

APPENDIX 2. PERSONS INTERVIEWED

1. Dr Ta Quang Minh, Legislation and Management Division, National Office of Industrial Property of Vietnam
2. Ms Mai Van Son, Deputy Director, International Relations, National Office of Industrial Property of Vietnam.
3. Dr Nguyen van Giap, Head of Legal and Trademark Section, Patent Trademark Bureau, Vietnam
4. Mr Nguyen Thanh Tung, National Institute for Science, Technology Policy and Strategy Studies, Vietnam
5. Mr Makha Chanthala, Director, IP Division, Intellectual Property Office, Vientianne, Lao PDR
6. Mr Khemadhat Sukondhasingha, Chairman, MTEC Board, National Science and Technology Development Agency, Bangkok, Thailand
7. Ms Emma Francisco, Director General, Intellectual Property Office, Philippines
8. Ms Ireneo Galicia, Deputy Director General, Intellectual Property Office, Philippines
9. Ms Brenda Nazareth, Regional Director, Department of Science and Technology (DOST), Philippines
10. Dr Constancio Canete, Regional Director, Department of Science and Technology (DOST), Philippines
11. Mr Angelito Alulod, Regional Director, Department of Science and Technology (DOST), Philippines
12. Dr.Ben Ladilad, Regional Director, Department of Science and Technology (DOST), Philippines
13. Mr Tom Brinas, Chief of Division, Technology and Promotion and Application Institute DOST, Philippines
14. Ms Isabela Palanca, Philippine Women's Business Council.
15. Mr Aniano Bagabaldo, President, Philexport, Philippines
16. Ms Leny Abella, Vice President, Philexport, Philippines
17. Bp Zaenuddin, Assistant Deputy for Marketing and SME Networks, SME Ministry, Jakarta, Indonesia
18. Dr F.G. Winarno, Chairman, M-Brio, Jakarta, Indonesia
19. Dr Andi Eka Sakya, Assistant Deputy to the Minister for Priority and Strategic Research Program, Indonesian Ministry of Research and Technology, Jakarta, Indonesia
20. Ir Masfadjar Dasur, Deputy Minister, Marketing and Business Networking, Ministry of Cooperatives and SMEs, Jakarta, Indonesia
21. Mr. Halomoan Tamba, Deputy for Business Information, Ministry of Cooperatives and SMEs, Jakarta, Indonesia
22. Mr. Gary Kichenside, Director, Business Directions and International Cooperation, IP Australia, Canberra, Australia

23. Professor Peter Drahos, Australian National University, Canberra, Australia.
24. Ms Serene Koh, Head of Enterprise Technology and Support Services, SPRING, Singapore
25. Mr Khor Aik Lam, Assistant Director, Enterprise Development Department, Intellectual Property Office of Singapore
26. Mr Ismail Josoh, Malaysian Patent Office, Kuala Lumpur, Malaysia
27. Professor William Kingston, School of Business, Trinity College Dublin, Eire
28. Professor Stephen Hill, Director, Regional Office for Science Technology, East Asia, UNESCO, Jakarta, Indonesia
29. Dr Derry Pantjadarma, Head, Program Development, BPPT, Jakarta, Indonesia
30. Ir Texin Sirait, Managing Director, Enviro, Bekasi, Indonesia.
31. Mr Chin Ren, Assistant Registrar of Industrial Design, Intellectual Property Corporation of Malaysia, Kuala Lumpur, Malaysia.
32. Professor Martin Kretschmer, Department of Law, Bournemouth University, United Kingdom.
33. Ms Sarah Petherick, Managing Director, Sarah Petherick Ltd, Melton Mowbray, England.
34. Dr Nigel Clarke, Internet Promotions, European Patent Office, Vienna.
35. Atty. Cesar Cruz, Patent Attorney, Manilla, Philippines
36. Atty. Augusto San Pedro, Patent Attorney, Manilla, Philippines
37. Atty. Benjamin Santos, Patent Attorney, Manilla, Philippines
38. Atty, Andrew Michael Ong, Patent Attorney, Manilla, Philippines
39. Ms Dids Macdonald, Chief Executive, ACID (Anti-Copying in Design), London, United Kingdom
40. Mr Steffen Rebein, Director, Planning Division, Danish Patent and Trademark Office, Copenhagen, Denmark.
41. Mr John Horsted, Counsellor for Industrial Policy Projects, Danish Patent and Trademark Office, Copenhagen, Denmark.
42. Mr Arif Syamsudin, Head of Industrial Design, Indonesian Patent Office, Jakarta,Indonesia
43. Dr Puay Tang, Senior Research Fellow, Science Policy Research Unit, University of Sussex, United Kingdom
44. Dr Waldemar Kutt, Technical Assistance Unit, European Commission, Luxembourg
45. Dr Adrian White, International Intellectual Property Section, Department of Foreign Affairs and Trade, Canberra, Australia.
46. Ms Ieva Viluma, Legal Division, Latvian Patent Office, Riga, Latvia
47. Dr Martin Meyer, Research Director, Finnish Institute for Enterprise Management, Helsinki
48. Mr Karl Whitfield, Policy Directorate, UK Patent Office, Newport, United Kingdom.
49. Mr Thierry Consigny, Vice-President, Japan, Derwent, Tokyo, Japan
50. Professor Fortunato de la Pena, Undersecretary DOST, Manilla, Philippines

51. Ms Angle Tam, Hong Kong Intellectual Property Office, Hong Kong
52. Mr P Y Chu Kong, Intellectual Property Services Center, Productivity Council, Hong Kong
53. Miss Peggy Ng, Intellectual Property Services Center, Productivity Council, Hong Kong

APPENDIX 3. THE AUTHORS

Stuart Macdonald is Professor of Information and Organisation at the University of Sheffield. His research has long been concerned with the role that information plays in innovation and in change more generally. Most of the research is strongly empirical, generally involving long-term investigation within organisations. An approach that makes information central to enquiry does not fit comfortably within the boundaries of a single discipline and has necessarily been pursued in several. This is reflected in publication in journals of many disciplines - economics, physics, geography, history, engineering, electronics, agriculture, management. Inevitably, the research has become inter-disciplinary and multi-disciplinary. Much of it has been carried out overseas, a great deal in Australia. He currently has collaborators in many parts of the world.

Professor Tim Turpin is currently Acting Director of the Australian Expert Group in Industry Studies (AEGIS) at the University of Western Sydney. His research interests and experience over the last fifteen years have focused mainly on the processes through which knowledge is produced, managed and diffused. Most of this work has been concerned with cultural change taking place within universities, research institutes and other social institutions involved in the production of knowledge. He is currently undertaking a series of projects investigating the careers of scientists, and the impact of global and local pressures on relationships between scientists and the institutions with which they work.

Dr Amelia Ancog is a scholar and lawyer specialising in intellectual property and science, technology and innovation policy. She is currently living and practicing in the Philippines. She has worked extensively across the Asia and pacific region providing training and consulting services. She previously held senior positions in the Philippines government with responsibilities for the development of science and technology policy.