Uncovering Trade Secrets: Protection of Undisclosed Information in East and Southeast Asia, and Around the World

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Abstract

This paper considers trade secret protection in a sample of East and Southeast Asian economies using a ground-breaking new indicator of the stringency of trade secret protection, the Trade Secrets Protection Index (TSPI). This indicator, developed under the auspices of an OECD research project, is based on a detailed comparative legal analysis that reduces trade secret law to a series of quantifiable components, enabling the creation of a numerical indicator of trade secret stringency. The TSPI permits meaningful comparisons of trade secret protection among countries as well as economic analysis of key relationships between trade secret stringency and key economic indicators.

The paper finds that trade secret protection has generally increased in East and Southeast Asia over the past two decades. Yet, there remains significant variation in the levels of protection among the economies in the region. In some cases, stringency varies notably across the key aspects of protection within a given economy. A short economic assessment -- including qualitative and quantitative elements -- highlights the generally positive association of the stringency of trade secrets protection to certain economic performance indicators (e.g. R&D, FDI and trade). Nonetheless, it should be noted that care is needed in the interpretation of these findings in that the analysis does not demonstrate causality and is based on a specific sample of economies for a certain time period.

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1. Introduction[1]

1. Protection for trade secrets has emerged as an area of rising concern for governments and businesses around the world. Using an empirical approach, this paper considers the protection of trade secrets in the dynamic East and Southeast Asia region in comparison with a global sample of countries. The assessment covers the period since 1985, an era of wide-ranging reforms with respect to protection of trade secrets. The objective is to consider the stringency of available protection and its evolution in association with certain relevant aspects of economic performance.

2. The paper begins by introducing the international legal framework and an indicator for the stringency of trade secrets protection, the Trade Secrets Protection Index (TSPI). The assessment of the stringency of protection is based on a methodology developed as part of a project of the Organisation for Economic Co-operation and Development (Schultz and Lippoldt, 2014). The paper then provides an international comparative legal analysis highlighting specific similarities and differences in the regimes for protection of trade secrets among East and Southeast Asian economies, and in comparison to global norms. A short economic assessment -- including qualitative and quantitative elements -- highlights the association of trade secrets protection with innovation and international economic indicators (e.g. R&D, FDI and trade). The conclusions sum up the empirical findings with a particular emphasis on the situation in East and Southeast Asia. This paper aims to provide transparency and supporting evidence for the analysis via ample footnotes, references and annexes detailing data sources and economy-specific considerations.

2. International Framework

3. In recent decades a wave of reform of trade secrets protection resulted in increased availability and average stringency of protection, though with considerable differences between countries in the means used to achieve this result and significant remaining variation in the levels of protection that are afforded. The World Trade Organisation's (WTO) *Agreement on Trade-Related Aspects of Intellectual Property Rights* (TRIPS) Agreement was an important catalyst in these developments, being the first multilateral agreement to directly address trade secrets protection in an enforceable manner. The TRIPS Agreement addresses trade secrets based on the notion that protection against unfair competition should include

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protection for undisclosed information.[2] In presenting this approach, the TRIPS Agreement makes reference to the prior-existing protection against unfair competition as presented in the Paris Convention for the Protection of Industrial Property, a convention that is administered by the World Intellectual Property Organization.[3]

4.   Guided by the provisions of Article 39 of the TRIPS agreement (see Annex 1, below), many countries have adopted a three-part definition of trade secrets. As noted by Schultz and Lippoldt (2014, pp. 7-8), countries' laws typically define a trade secret as information that is secret, has commercial value as a result, and is subject to reasonable efforts to maintain the secrecy. They further point out that "The concepts tend to be applied as follows:

- *Secrecy.* The information protected must actually be secret. Secrecy need not be absolute. Secrecy requires that the information must not be readily publically accessible and that it is revealed to others only under conditions that maintain secrecy with respect to the broader public.[4] Thus, the trade secret owner may share the information with employees and business partners.

- *Commercial Value.* The information must have economic value as a result of its being secret and must derive some utility from being kept secret.

- *Reasonable Efforts to Maintain Secrecy.* The information must be the subject of reasonable efforts on the part of the rights holder to maintain its secrecy. By its nature, a trade secret claim arises when measures to protect the secret have failed. Thus, the law tends not to require one who claims a trade secret to be entirely successful at protecting it. In national laws, the necessary effort is often broadly described as "reasonable," in keeping with Article 39 of TRIPS.[5]

Trade secrecy provides a conditional right to the exclusive use of information developed and protected by the owner. Another party who independently develops the information or obtains it fairly may freely utilise it. If the information enters the public domain, trade secret protection ceases. Thus, unlike patented inventions or copyright-protected content, trade secrets are not protected for a statutory time limit and they can last indefinitely, but most likely will run out in the regular course of competition as they become obsolete or common knowledge.

5.   The scope of trade secrets varies somewhat by country, but broadly covers three categories of information: (1) technical information; (2) confidential business information; and (3) know-how. Technical information concerns such matters as industrial processes, blueprints and formulae, among other

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[2]   For descriptive convenience this paper will employ the term "trade secrets" as encompassing "undisclosed information."

[3]   Schultz and Lippoldt (2014, section 2) provide further details on the international framework for the protection of trade secrets.

[4]   Moreover, as Pooley (1997) notes, the idea need not be unique to its owner. Several competitors could have developed the same idea via independent innovation and sought to protect it as a trade secret. This possibility is one factor that differentiates trade secrets from patents.

[5]   However, some countries impose more specific, additional obligations, which might be characterized as a particular implementation of the broad reasonableness requirement. For example, some common law countries require that the defendant have a contractual or implied obligation to keep the information secret. Other countries require written agreements with recipients and confidentiality notices.

possibilities. Confidential business information typically includes customer lists (provided that they include truly non-public information), financial information, business plans and similar types of non-public information regarding the operation of a business. Know-how includes information about methods, steps and processes for achieving efficient results. Most countries recognise the first two categories, often without differentiating them. Know-how is a term commonly used both in discussion of proprietary information and in agreements, but it enjoys less formal recognition as a separate, defined category of trade secrets and tends to be subsumed into the category of technical information.

6.   The TRIPS Agreement does not provide much guidance on the specifics of the national systems to be put in place to protect trade secrets. Consequently, countries employ a broad range of means to provide the TRIPS-mandated protection. In some instances, countries have implemented legislation expressly addressing trade secrets protection or have well-established common law protection. In others, the obligation is met by laws that concern misappropriation via such means as breach of contract, inducement of others to breach contracts and acquisition by third parties of information known to be disclosed dishonestly or where it was negligent not to know. This variation in approach can affect the ways businesses and workers conduct their affairs and thus there are reasons to believe that the specifics of the available legal protection for trade secrets may have important economic effects.

3.   Trade Secrets Protection Index - Taxonomy of elements of protection

7.   In order to measure the extent of the variation in stringency of available protection for trade secrets, Schultz and Lippoldt (2014) developed the Trade Secrets Protection Index (TSPI). Chart A.1 presents the detailed composition of the index and its scoring. The index is structured around five main components:

1. Definitions and coverage

2. Specific duties and misappropriation

3. Remedies and restrictions on liability

4. Enforcement, investigation and discovery; data exclusivity

5. System functioning and related regulation.

The approach to scoring provides up to one point for each of the five main components of the index and a maximum total score for the index of five points. However, as can be seen in Chart 1, the number of elements covered by each of the main components of the index varies widely. For example, the definition and coverage of trade secrets protection comprises 13 elements, whereas the system functioning and related regulation comprises 4 elements. In order to maintain balance across the five components of the index, the scoring for the various elements under each of the five main components was normalized to ensure equal weighting (see Box 1, below). In other words, the elements for each main component add up to a maximum score of one.[6] Overall, the index is designed to capture information on the stringency of the available protection in a manner that is internationally comparable.[7]

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[6]   For example, component 4 *Enforcement, investigation and discovery; data exclusivity* is comprised of six elements. The value for the Component 4 score can range from 0 to one. In the final calculation of the score for the overall component, the scores for any given element would be no more than 1/6 of one point. This would be the case, for example, for data exclusivity for drugs or data exclusivity for agricultural chemicals (each would contribute no more than 1/6 of one point to the component score).

[7]   The development of the TSPI index is a pioneering effort to advance analysis based on international comparisons of a broad range of alternative protections available for trade secrets. It should be noted

8. As Schultz and Lippoldt (2014) noted, the TSPI's design is guided by a number of considerations that aim to enhance its reliability as a meaningful, useful and objective indicator.

- First, the components of the TSPI represent key aspects of protection of trade secrets where there is some variation across countries that may influence the stringency of protection.

- Second, the elements of the TSPI were structured to enable scoring based primarily on objective criteria. The index thus relies on observable, verifiable facts such as laws on the books. However, this material is supplemented in some limited cases by qualitative information in the form of credible, expert opinion where such information is necessary to better reflect operational realities (e.g. where commentators observe that a particular remedy is not in fact available or that courts impose additional requirements for protection that are not apparent on the books).

- Third, in order to ensure coherence across the components and an assessment that reflects an accumulation of factors, the index employs an integrated index approach rather than presenting separate indicators for each component.

- Fourth, the presentation of the index emphasises transparency, with scores supported by a text chart for each country supported by references to the primary sources and the relevant literature (published in Schultz and Lippoldt, 2014, and Lippoldt and Schultz, forthcoming).

- Fifth, the index is designed to effectively convey comparative information about trade secrets by providing a neutral, detailed and purely descriptive indicator of the stringency of available protection. As a measurement tool, the TSPI simply measures its target subjects, unobscured by normative conclusions or judgments about the subject. Any given score is an accumulation of elements typically employed in and relevant to trade secret protection rather than an assessment of the appropriate level of protection. The scores that the TSPI produces are neither grades nor ratings, but rather measurements. Observers are enabled to draw their own conclusions from the objective information presented.

4. Overview of the Sample

9. The assessment presented in this paper is based on a diverse global sample of 37 economies from around the world (Chart 1), covering where possible the time period from 1985 to 2010 in five year increments (i.e. with observations at five-year intervals). This is an unbalanced panel in that not all economies are covered in all periods. The underlying database includes detailed textual data on the various dimensions of protection of trade secrets, prepared in a structured and standardized fashion. This information is scored using the methodology for the Trade Secrets Protection Index (TSPI). For the following analysis, the TSPI database has been merged with a newly constructed database of quantitative

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that a variety of similar indices exist in the literature covering other types of intellectual property and even certain aspects of trade secrets protection. For example, Park (2008) employed laws-on-the-books approaches to examine protection of patents, trademarks and copyright. Pugatch et al. (2014) developed an empirically based index of the strength of IPR protection, which also incorporated industry perspectives. Png (2012a and b) developed an indicator for use in his analytical work on trade secrets protection in the United States. Also, the Fraser Institute and World Economic Forum, among others, have developed substantial sets of relevant systemic indicators for use in economic analyses. Certain of these indicators have been utilized in related studies conducted by the OECD on patents, trademarks and copyright, e.g. see: Park and Lippoldt (2008); and Cavazos, Lippoldt and Senft (2010).

indicators reflecting economic conditions and performance (see Annex 2 for a detailed listing and sources).

10. The focus of this paper is on a subset of economies in East and Southeast Asian economies, which are considered in comparison to the overall sample. A total of 15 economies in the East and Southeast Asia region are covered in at least a general manner, with detailed assessments included for 11 of these economies. Figure 1 presents the TSPI scores by country and component for the full sample of 37 economies for which data are available.[8] The Figure presents the sample economies in rank order based on the total TSPI scores for each economy as of 2010. The East and Southeast Asian economies can be found distributed across the breadth of the figure, with scores ranging from 2.45 for Philippines to 4.27 for Japan. The average score for the East and Southeast Asian economies is 3.35, which is somewhat lower than the overall average of 3.57 for all the economies shown in the figure.

Chart 1. Coverage of the Present Study

East and Southeast Asia (covered in qualitative & quantitative assessments)	Countries in Other Regions (covered in the quantitative assessment)
China	Argentina
Chinese Taipei	Australia*
Hong Kong, China	Brazil
Indonesia	Bulgaria
Japan*	Canada*
Korea*	Colombia
Malaysia	France*
Philippines	Germany*
Singapore	Ghana
Thailand	India
Vietnam	Ireland*
	Israel*
Southeast Asian countries (covered in the qualitative assessment)	Italy*
	Latvia
Brunei	Lithuania
Cambodia	Mexico*
Laos	Netherlands*
Myanmar	New Zealand*
	Peru
	Russia
	South Africa
	Spain*
	Sweden*
	Turkey*
	United Kingdom*
	United States*

Note: * OECD Countries indicated with an asterisk.

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[8]   Economies only covered in a qualitative manner are not included in Figure 1 or other parts of the quantitative analysis.

11. Figure 1 and Annex Table A.1 present the scores for each of the components of the TSPI (see Box 1 for a discussion of the weighting of these components). A comparison of the average component scores for the East and Southeast Asian region and the overall sample, reveals that the biggest differences concern *Enforcement, investigation and discovery; data exclusivity* (with an average of 0.52 in the region versus an overall average of 0.63) and *Duties and misappropriation* (with a regional average of 0.78 versus an overall average of 0.85). There is considerable diversity in the scores for each group. This is a reflection of the range of approaches employed in providing trade secret protection. Even for economies with similar scores, various combinations of component scores can be found. For example, Malaysia and Thailand have similar scores (3.48 and 3.42, respectively). Yet, Malaysia arrives at that level in part through comparatively stringent *Enforcement, investigation and discovery* provisions (e.g. including emergency search, which Thailand lacks), whereas Thailand has comparatively strong *Definition and coverage* provisions (including coverage of trade secrets in criminal law, which Malaysia lacks).

Box 1. Alternative Weighting Approaches

As noted above, the TSPI is constructed using equal weighing among the index components. Yet, industry concerns often focus in particular on enforcement and remedies.[9] Thus, the robustness of the rankings in the standard TSPI rankings was tested using two alternative weighting schemes: a doubling of the weight for enforcement and related elements and a doubling of the weight for remedies and related elements. Weights for the other index components were reduced in each case. The results are presented in Table A.2.

The robustness of the equal-weight rankings is notable, with relatively little change in the rankings under each of these two weighting adjustments. The correlation coefficients between the original series and the adjusted series were 0.94 in the case of the enforcement adjustment and 0.96 in the case of the remedies adjustment (a coefficient of 1 would indicate a perfect correlation). The Spearman Rank correlation between the original series and the adjusted series was 0.92 in the case of the enforcement adjustment and 0.96 in the case of the remedies adjustment. In addition, despite some modest variation due to the adjustments, under each weighting scheme the average score for East and Southeast Asia remained smaller than the overall average score for the entire sample.[10]

As a result, of this consistency across the alternatives, the authors opted for use of an equal-weighting approach. This avoids the risk of introducing a subjective distortion via an alternative weighting approach and it preserves the simplicity of the construction of the index.

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[9]   E.g., a recent article in *Intellectual Property Watch* ("How To Safeguard Trade Secrets: Think ROI", by Pamela Passman, 17.03.2014) notes that even in the Asian context where laws have been strengthened, there remain challenges in practise to effective enforcement and availability of adequate remedies: http://www.ip-watch.org/2014/03/17/how-to-safeguard-trade-secrets-think-roi/ (accessed 05.09.2014).

[10]   While the difference between the East and Southeast Asia average and the overall average for the equal-weighted sample was 0.32, the margin for the enforcement over-weighted series was 0.30 points and in the remedies over-weighted series the margin was 0.15.

Figure 1. Trade Secrets Protection Index, By Economy and Component, 2010

- 1. Definition and coverage
- 3. Remedies and restrictions on liability
- 5. System functioning and related regulation
- 2. Duties and misappropriation
- 4. Enforcement, investigation and discovery; data exclusivity
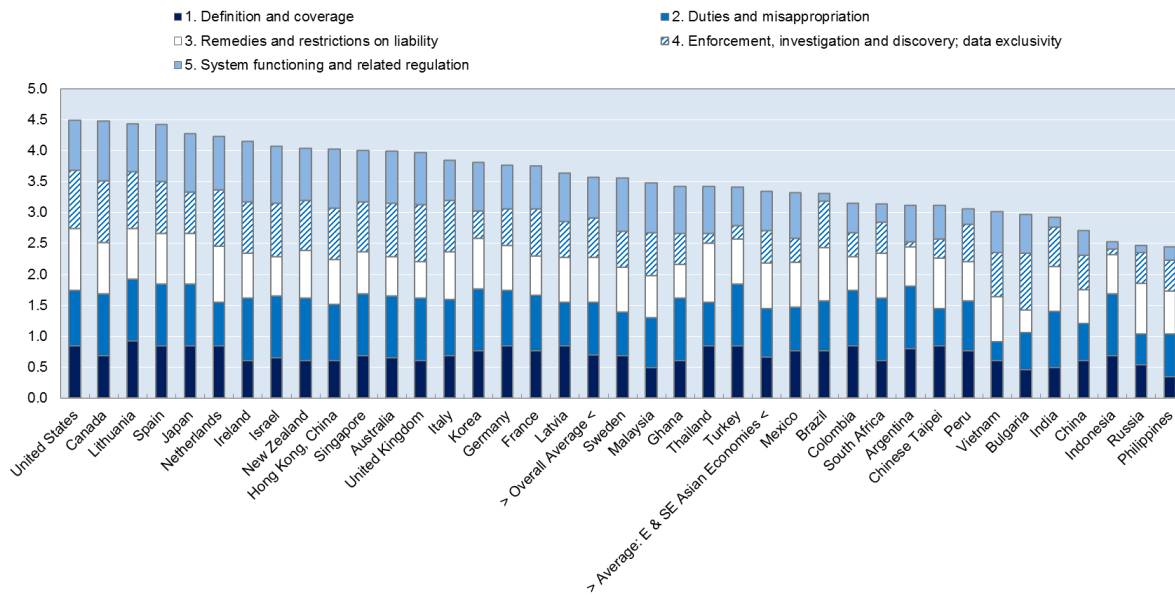
Figure 2. Trade Secrets Protection Index, by country group and year

(Balanced panel comparison of economies for which data are available for all years shown)

- Selected E & SE Asian Economies (10)
- Sample Economies (32)
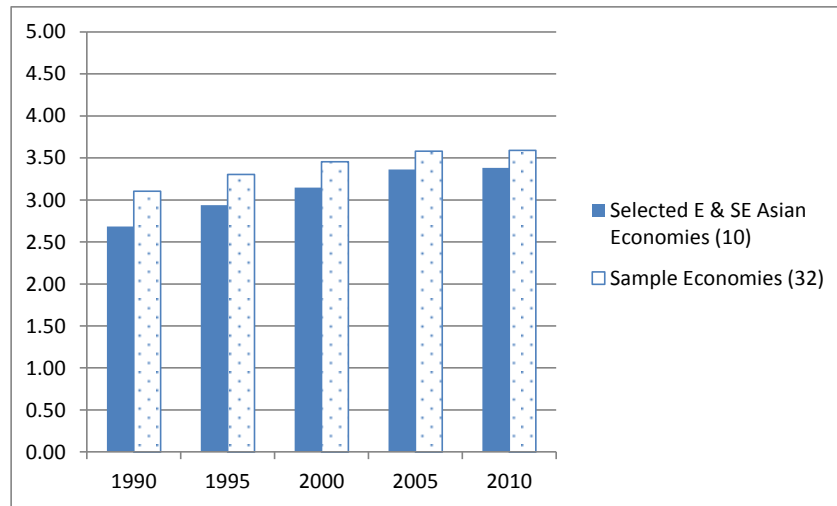
Notes:

i) All East and Southeast Asian economies covered in each year - China, Chinese Taipei, Hong Kong - China, Indonesia, Japan*, Korea*, Malaysia, Philippines, Singapore, Thailand.

ii) All sample economies covered in each year - Argentina, Australia*, Brazil, Canada*, China, Chinese Taipei, Colombia, France*, Germany*, Ghana, Hong Kong-China, India, Indonesia, Ireland*, Israel*, Italy*, Japan*, Korea*, Malaysia, Mexico*, Netherlands*, New Zealand*, Peru, Philippines, Singapore, South Africa, Spain*, Sweden*, Thailand, Turkey*, United Kingdom*, United States*.

iii) * = OECD countries.

12. In order to provide a sense of the evolution of the stringency of trade secrets protection over time as measured by the TSPI, Figure 2 presents the average strength of protection in East and Southeast Asia in comparison to the overall average for the sample.[11] As can be seen, the period around the entry into force of the WTO TRIPS Agreement in 1995 witnessed an increase in the average stringency of protection of trade secrets in the region and for the overall sample. On average, East and Southeast Asia experienced greater gains than the overall average for the sample, winding up in 2010 just 0.2 points below the overall average. These averages, however, mask considerable underlying variation. Further detail by country over time is presented in Annex Figure A.1 and Annex Table A.3. The country-level data reveal some striking developments in the evolution of the stringency of trade secrets protection in the region. Economies such as China, Chinese Taipei, Korea and Thailand reinforced the protection in a striking manner, each increasing their TSPI scores by more than 1 point between 1990 and 2010 (though from different starting points). Indonesia registered notable increases as well. The Philippines on the other hand registered a notable decrease in protection early in the period, before stabilising later on. The next section of the paper will consider the concrete legal developments underpinning these changes.

5. Regional Legal Developments

13. Few generalizations regarding trade secret law in East and Southeast Asia are appropriate given the diversity of this group of economies and their political and legal systems. One notable observation can be made with respect to timing: on a global scale, these Asian economies are relative latecomers to trade secret protection. Even Japan, which had the region's first comprehensive statutory protection for trade secrets, enacted this law in 1991.[12] Since the early 1990s, however, as noted above, a number of Asian economies have dramatically increased the stringency of their trade secret protection. To the extent that some countries score lower or higher than others on the TSPI, the reasons vary greatly. These Asian economies do not differ from the rest of the world in this respect.

14. This section assesses the trade secret laws of 15 countries in Asia, summarizing the research and findings on which the TSPI is ultimately based. The Section provides a comparative assessment, giving an overview of trade secret law in Asian countries with respect to a number of provisions. Country-by-country summaries of key features of each country's trade secret laws are provided in Annex 3. The summary presented draws on the substantial body of information collected in the authors' underlying database.[13]

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[11]   The Figure only includes those economies for which data is available in all years; that is, to ensure comparability over time it presents a balanced panel.

[12]   Unfair Competition Prevention Act (Act No. 47 of 1993) (up to the revisions of Act No. 62 of 2011, Effective 1 December 2011); unofficial translation available as of 8 May 2014 at: http://www.wipo.int/wipolex/en/text.jsp?file_id=254517.

[13]   More detailed analyses are provided in the authors' earlier work: Schultz, M. F. and D. C. Lippoldt (2014); Lippoldt, D. C. and M. F. Schultz (forthcoming), "Uncovering Trade Secrets: An Empirical Assessment of Economic Implications of Protection for Undisclosed Data", OECD. The TSPI is based on the more detailed, nuanced analysis provided in these prior works and unpublished updates prepared for the present paper.

5.1. Comparative Assessment of Trade Secret Laws in East and Southeast Asia

15. This comparative assessment considers trade secrets protection in the region as of 2010, with subsequent developments noted in some cases in the associated country notes (Annex 3). The assessment highlights the availability of various elements of trade secrets protection grouped into five main categories: 1) types of trade secret protection available, 2) scope of available trade secret protection, 3) means of investigation and litigation of trade secret claims, 4) remedies available pursuant to trade secret law and 5) related policies. These are each treated in turn. For purposes of brevity, short summary tables provide cross-country overview comparisons for the elements considered for each category. In scoring the TSPI for each economy, the situation with respect to each of these elements is taken into account. Due to the limited nature of trade secrets protection in Brunei, Cambodia, Laos and Myanmar, these countries are only covered in the discussion of the first element (types of protection). These four countries – three of which figure on the UN's official list of Least Developed Countries (LDCs) – do not generally offer the other elements of protection and are not scored in the current TSPI rankings.

5.1.1 Type of Trade Secret Protection Available

16. Chart 2 summarises and compares the types of trade secret protection available in the sample of 15 East and Southeast Asian economies. Of those examined, 11 have at least some sort of comprehensive civil or criminal protection for trade secrets provided under statutory or common law. Among those with such protection, all of them except the Philippines offer civil protection and about half of them offer criminal protection. The remaining four countries – Brunei, Cambodia, Laos and Myanmar – offer only limited protection by means of contract.

17. Globally, criminal trade secret prosecutions are not common, but some observers point out that they can be an important tool for enforcing trade secrets.[14] The availability of criminal remedies may have deterrent effects. Also, prosecutors empowered by criminal statutes generally have wider investigative powers than civil plaintiffs, which may allow them to conduct more resource-intensive investigations and take advantage of greater capabilities to obtain evidence. Six of the 15 sample economies in the East and Southeast Asia region offer general criminal protection of trade secrets.

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[14]   For example, see the discussion of the case of Germany here: Hogan Lovells (2012), Study on Trade Secrets and Parasitic Copying (Look-alikes), MARKT/2010/20/D, Appendix 2, available here (as of 16 November 2014): http://ec.europa.eu/internal_market/iprenforcement/docs/trade-secrets/120113_study_en.pdf. Further discussion in the case of the United States can be found here: Peter Toren, An Analysis of Economic Espionage Act Prosecutions: What Companies Can Learn From It and What the Government Should Be Doing About It!, 84 BNA *Patent, Trademark & Copyright Journal* 884, at 3 (21 September 2012).

Chart 2. Type of Trade Secret Protection Available, 2010

Economy	Protection by means of enforcement of contracts	General civil protection of trade secrets by means of statute or common law	General criminal protection of trade secrets
Brunei	X		
Cambodia	X		
China	X	X	X
Chinese Taipei	X	X	X
Hong Kong, China	X	X	
Indonesia	X	X	X
Japan	X	X	X
Korea	X	X	X
Laos	X		
Malaysia	X	X	
Myanmar	X		
Philippines	X[15]		Limited X[16]
Singapore	X	X	
Thailand	X	X	X
Vietnam	X	X	

5.1.2   Scope of Trade Secret Protection

18. Chart 3 summarises and compares the scope of trade secret protection available in these economies. There are essentially two ways to infringe a trade secret: (1) using or disclosing it in breach of a duty to keep it secret; and (2) misappropriating it by committing a crime, tort or other wrongful act.

19. Breach of duty usually applies to employees and business partners, while misappropriation typically applies to unrelated third parties. There are two types of duties to keep secrets – express and implied. Some countries only recognize a breach of duty in the presence of an express contract, while others will imply a duty in the absence of an express agreement – typically with respect to employees and managers. Recognition of implied duties is significant, as not all industries or situations enable a party to obtain an express agreement easily.

20. Sanctioning of misappropriation is also an important form of trade secret protection. It deters and discourages acts of industrial espionage. Otherwise, trade secret owners may be vulnerable to eavesdropping and various forms of illicit gathering of information.

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[15]   Very limited protection is available via statute in the Philippines, effectively requiring a contractual obligation.

[16]   Employees and managers may be criminally liable for breach of duty in the Philippines (Rev. Penal Code, Art. 292). There is also a very specific provision sanctioning unauthorized interception of documents.

21. Across the economies covered in Chart 3, trade secrets are generally protected with respect to breach of duty in the presence of an express contractual obligation. The legal systems in seven of these economies also recognise breach of implied duties. Nine of them offer some form of protection against misappropriation of trade secrets by third parties.

Chart 3. Scope of Trade Secret Protection, 2010

Economy	Breach of duty by breach of express contract	Breach of implied duty (e.g. employees and managers)	Misappropriation by third parties (e.g. protection against industrial espionage)
China	X		X
Chinese Taipei	X		X
Hong Kong, China	X	X	X
Indonesia	X	X	X[17]
Japan	X	X	X
Korea	X	X	X
Malaysia	X	X	
Philippines	X		
Singapore	X	X	X[18]
Thailand	X		X
Vietnam	X	X	X

5.1.3   Investigation and Litigation of Trade Secrets

22. Chart 4 summarises and compares the laws in the region with respect to investigating trade secret infringement, conducting pre-trial discovery, and protecting trade secrets during litigation. Trade secret owners may find it difficult to obtain the information necessary to prove their claims. By their nature, trade secrets are capable of concealment and information regarding them is kept confidential. Evidence of infringement is thus unlikely to be publically available, and any evidence of wrongdoing is likely to be held closely in a defendant's hands. That potential defendant may also find it possible to conceal or destroy evidence of wrongdoing. Therefore, procedures for investigating trade secrets play an important role in trade secret enforcement.

23. One procedure available in many countries is a preliminary search to preserve evidence (often called an "Anton Piller Order" in countries with legal systems having origins in the United Kingdom). Such searches take place before or at the start of litigation in order to prevent the destruction of evidence. This type of search is particularly effective if ex parte, because surprise deprives the defendant of the opportunity to conceal evidence. Preliminary searches are available in six of the economies, with ex parte search available in five cases.

24. The availability of pre-trial discovery also varies. Two of the regional economies allow for extensive pre-trial discovery, but in others the opportunity is either limited (typically limited to producing

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[17]   Indonesia recognises misappropriation only for fraud and not for corporate espionage.

[18]   Although information must generally be imparted in confidence, courts in Singapore have waived this requirement, at least where defendant engaged in tortious or criminal act to obtain information that the defendant could not obtain legally.

documents) or does not exist. Lack of discovery may leave a plaintiff unable to prove a case and deter it from brining a case at all.

25. Trade secrets are also fragile, and thus their protection during litigation is important to the owners. A plaintiff may face a situation where trade secrets have been misappropriated, but not made public. Litigation may put the secret at further risk of disclosure to other competitors and the world unless the court system offers sufficient safeguards. Where safeguards are insufficient, a trade secret owner may face the unattractive choice of letting a single competitor get away with trade secret infringement or litigating and losing the trade secret entirely. The chart below details differences among countries with respect to this issue. Only five of the economies offer broad protections during litigation, while five offer limited protection and one offered none as of 2010.

Chart 4. Investigation and Litigation of Trade Secret Claims, 2010

Economy	Preliminary search ("Anton Piller Order")	Ex Parte preliminary search	Pre-trial discovery	Protection of trade secrets during litigation
China	X	X		Limited
Chinese Taipei				Yes.
Hong Kong, China	X	X	X	Limited.
Indonesia				Limited
Japan	Limited		Limited	Yes in civil None in criminal
Korea			Limited	None[19]
Malaysia	X	X	Limited.	Yes.
Philippines			X	Yes
Singapore	X	X	Limited	Yes
Thailand			Limited	Limited
Vietnam	X	X		Yes

5.1.4   Remedies Available Pursuant to Trade Secret Law

26. Chart 5 summarises and compares the laws of the East and Southeast Asian economies with respect to remedies. There are three primary types of remedies available in trade secret cases: injunctions, damages and criminal sanctions. Of the three, the availability of an injunction may be most important to a trade secret owner. Trade secrets are fragile – secrecy is easily destroyed, and with it, the trade secret. Thus, trade secret owners seek swift injunctions to remove the secret from the hands of a competitor who may misuse it or reveal it to others. Because the speed of injunctions is important, the availability of ex parte relief is also particularly important. The chart below summarises and compares these components of trade secrecy. It is notable that the largest economies in the region lack ex parte preliminary injunctions: China, Chinese Taipei, Indonesia, Japan and Korea. On the other hand, all of the economies provide for payment of damages. Seven of the economies provide for criminal sanctions, plus one offers similar administrative remedies (Vietnam).

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[19]   In 2012, legislation added protection in Korea with respect to the case record.

Chart 5. Remedies Available Pursuant to Trade Secret Law, 2010

(Excludes Contractual Remedies)

Economy	Ex parte preliminary injunctions	Preliminary injunctions	Damages	Criminal sanctions
China			X	X
Chinese Taipei		X	X	X
Hong Kong, China	X	X	X	
Indonesia		X	X	X
Japan		X	X	X
Korea		X	X	X
Malaysia	X	X	X	
Philippines	X	X	X (Limited to compensatory)	X
Singapore	X	X	X	
Thailand	X	X	X	X
Vietnam	X	X	X	Administrative remedies are available.

5.1.5   Related Policies

27. Chart 6 presents the situation with respect to key policies that influence the protection of trade secrets: validity of non-competition clauses; data exclusivity; and technology transfer regulations. Such policies may draw on concepts from the TRIPS Agreement, which references unfair competition and protection of undisclosed test and other data.

28. Non-competition clauses restrict the ability of an employee (or sometimes a business) to compete with a business after the end of an agreement (Box 2). They are most typically applied to employees and managers who are likely to retain sensitive information and know-how after they leave employment, thus the close relationship to trade secret law. They can be an effective tool for protecting trade secrets against breach of duty because they may prevent a former employee from obtaining a position where the individual may breach the duty. However, these clauses may impair the ability of an individual to earn a living, and thus are often treated sceptically under legal systems. Globally, such clauses are typically enforceable, if at all, only if necessary and only if reasonable with respect to duration, geographic scope, and restrictions on the subject's ability to make a living. Some countries restrict such clauses even further or prohibit them outright. The situation among Asian economies is typical of the world-wide situation in that most allow non-competes, conditioned on reasonableness, while a minority limit them or ban them outright (including Malaysia and Vietnam).

29. Data exclusivity applies to test data submitted for regulatory approval of pharmaceuticals or agricultural chemicals. Data exclusivity clauses typically prohibit other companies (e.g. generic drug companies) from relying on the originator's data to obtain regulatory approval for their equivalent pharmaceutical or agricultural chemical. The duration of available protection varies by country. Such provisions have become increasingly common in recent years, but they are still the subject of some controversy. The situation among Asian countries is similar to the global situation: Many countries grant data exclusivity, but a significant minority does not, notably China, Indonesia and Thailand. Philippines does not provide data exclusivity with respect to pharmaceutical products.

30. Finally, the chart tracks technology transfer regulations. Technology transfer regulations are typically aimed at foreign investors and seek to ensure the transfer of technology and know-how to the domestic economy. Such policies were common in the past, but have fallen from favour in recent decades. They often pose a threat to an investor's trade secrets, because they may prohibit or limit the term of obligations not to use know-how and other proprietary information after the term of the agreement. They thus also tend to serve as a disincentive to foreign direct investment (FDI). Most countries have eliminated such provisions, but a few have kept them. Some countries have made the provisions far less onerous, requiring simple registration of the agreement without substantive review. Some countries retain substantive review. Among the Asian economies studied here, almost half maintain some technology transfer provisions. This is a higher proportion than in most other regions. Chinese Taipei, Indonesia and the Philippines require substantive reviews of proposed technology agreements.

Chart 6. Related Policies

Economy	Validity of non-competition clauses	Data exclusivity	Technology transfer
China	Limited		Registration of technology agreements only.
Chinese Taipei	X	X	Substantive review of technology agreements.
Hong Kong, China	X	X	
Indonesia	X		Substantive review of technology agreements.
Japan	X	X	
Korea	X	X	
Malaysia		X	
Philippines	X	None for pharmaceuticals; but, available for agricultural chemicals	Substantive review of technology agreements.
Singapore	X	X	
Thailand	X		
Vietnam		X	Registration of technology agreements only.

Box 2. A Question of Balance: Trade Secrets, Employment Obligations and Non-Competes

Evidence from case studies and surveys cited in the literature indicates that loss of trade secrets often takes place when employees depart a firm. Employers thus seek to reduce such risks through post-employment obligations on employees. These obligations take two forms, post-employment *duties of confidentiality* and specific *non-competition agreements.* In some countries, the law imposes such obligations, at least to a degree. Even more commonly (almost universally for certain types of employees in some industries), employers further impose or supplement such duties through contractual agreements with their employees. The stringency of such obligations can influence the functioning of the labour market with respect to job placement and employee mobility. Governments generally aim to strike a balance of interests in this regard. This balance considers protection of an ex-employee's ability to earn a living through use of their general skills and knowledge against the need for protection of an employer's trade secrets against inappropriate use or disclosure by former employees.

In the event of an employee separation, a number of legal principles may be applicable with respect to undisclosed information: i) protecting trade secrets, ii) the fiduciary duties of employees, iii) freedom of contract, iv) policies against restraint of trade, v) protecting an employee's ability to earn a living and vi) policies against wasting human capital. The first three may be invoked in support of post-employment protections for employers, while the second three may be engaged in support of limiting employee obligations to former employers. In practice, these competing principles are balanced through legal doctrines, positive laws, and policies governing the post-employment duties of confidentiality and non-competition agreements. Where such post-employment obligations exist in Asia, they are often subject to requirements aimed at ensuring they are "reasonable" in terms of their scope and duration.

5.1.6   Summing Up

31. With the exception of the three LDCs in the sample and Brunei, the foregoing comparisons highlight the existence of a fair degree of convergence in most of the East and Southeast Asian economies with respect to the types of available protection (with the exception of criminal law), certain elements in the scope of available protection (e.g. breach of contractual duties), availability of certain remedies (e.g. preliminary injunctions and damages), as well as certain related policies (e.g. validity of non-competition clauses). It is in the application of these shared approaches via investigation and litigation that considerable variability – and in some cases, gaps – remain. In economies where plaintiffs encounter limitations in the discovery process, risk loss of trade secrets to the public during trials, or lack recourse to ex parte search and injunctions, the functioning of trade secrets protection is significantly weakened. In such cases, even where the other elements of the system of protection are available, it may be difficult to prosecute the abuse of a trade secret.

6.   Why does it matter?

32. The variation in trade secrets protection matters, in part, because it appears to be related to certain aspects of economic performance. This section of the paper presents two illustrative exercises to explore the relationships. The first exercise is a simple scatter plot comparison of TSPI results for the East and Southeast Asian economies seen in comparison to selected indicators of economic performance. The second is a set of regression runs considering the association over time between the TSPI scores for individual economies in the global sample and relevant indicators of their economic performance, controlling for other factors.

33. Three specific dimensions of economic performance have been selected for this assessment based on indications from the literature. These represent cases where trade secrets protection may be hypothesised to play a role in incentivising positive economic responses. First of all, such incentives might motivate increased investment in innovation, for example, by offering improved prospects for the innovator to capture benefits from such investment thanks to trade secrets protection (e.g. Lemley, 2011; CREATe, 2012). Indeed for some types of innovation, trade secrets may afford protection in cases when other forms of intellectual property protection such as patents are not available (e.g. for formulae or tacit know-how) (e.g. Maskus, 2000, and Friedman et al., 1991). A second channel for economic effects might be incentives to transfer technology directly such as via partnerships or wholly owned international investments; such an effect might arise because the holders of a trade secret may be more willing to share their trade secrets in cases where they can be defended (Kitch, 1980; Freidman et al., 1991). A third channel for economic performance effects could arise in cases where trade secrets protection enables the sale of goods or services across national borders, especially in cases where the sale involves transfer of tacit know-how or other trade secrets (e.g. Maskus, 2000; CREATe, 2012; also with respect to intellectual property rights more broadly, Park and Lippoldt, 2008). These three examples are intended to be illustrative and the list is not exhaustive.

6.1   Scatter plots

34. A first rough examination of the data for the East and Southeast Asian economies can be made using simple scatter plots of the TSPI scores for the sample in comparison with certain economic indicators by country and year for the period from 1985 to 2010. Annex Figure A.2 highlights the relationship of TSPI scores to R&D expenditure as a percentage of GDP (Panel A), Foreign Direct Investment (Panel B) and services imports (Panel C). These plots illustrate simple association and do not control for other factors, but they can provide a visual indication of possible relationships. For illustrative purposes, selected country data are highlighted in the figures.[20]

35. In each of the plots, the relationship between trade secrets protection and the economic performance indicators is positive, as indicated by the slope of the trend line. The plotted relationships only account for between 21 and 35% of the variation. Other factors appear to drive much of the variation, but as the relationship to trade secrets protection is positive and non-negligible a more robust assessment will be made in the next section.

6.2   Regression Assessment

36. Regression analysis provides a means to perform a more rigorous assessment controlling for other factors (see Annex 2 for source information on the control variables).[21] For illustrative purposes, the relationship of the stringency of trade secrets protection to R&D indicators, FDI and imports of services and goods is assessed in separate regression runs (shown in Annex Table A.4). The runs are made using an ordinary least squares approach, with various control variables and country fixed effects. The variables are entered as natural logarithms (which means that the coefficients in the table show the approximate percentage change in the dependent variable for each percent of change in the independent variable).

37. The runs are conducted drawing on the full database for 37 economies, in order to maximise the number of observations and ensure greater statistical robustness. The assessments are run as pooled regressions with an unbalanced panel in that data are not available for all economies in all years. In each regression run (columns 1 through 6 in the table), the available data permit inclusion of between 20 and 24 economies. The geographic coverage for each run is shown in the notes to the table. As can be seen, each run includes between 4 and 5 East and Southeast Asian economies.

38. Columns 1 and 2 of the table highlight the relationship of specific aspects of trade secrets protection to R&D inputs including R&D expenditure per capita and R&D personnel as a % of the labour force. The TSPI is tested using two different formulations. In the first run, the TSPI is lagged 1 period as a test controlling for endogeneity. In the second run, the TSPI is combined with an indicator of the strength of patent rights. The rationale for this combination is that trade secrets may play a role in providing protection for R&D during the early stages of innovation, but then in some cases patent protection may be used to protect the innovation in later stages of development. In both runs, the indicators for trade secrets protection are positive and statistically significant. The controls for GDP are also positive and highly significant in both runs (total GDP in the first run and GDP per capita in the second).

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[20]   Scatterplots facilitate a rough visual first assessment of the sample data for the region. Due to the small sample size, the data for East and Southeast Asia were not assessed separately using regression analysis. Rather, where possible the data were included in the global, pooled sample for the regression assessment discussed in the next section.

[21]   Further analytical work on this topic is presented in Lippoldt and Schultz (2014).

39. Column 3 considers the relationship of the stringency of trade secrets protection to the volume of FDI, controlling for total GDP, market regulation (as measured by an indicator developed by the Fraser Institute), and the share of the labour force with tertiary education. In this run as well the relationship of the TSPI to the economic performance indicator (FDI) is positive and statistically significant, as is also the case for the coefficients for each of the control variables. The coefficient for FDI is relatively large compared to the other runs, meaning that FDI appears to be particularly responsive to variation in the stringency of trade secrets protection. The flows of FDI are particularly interesting in terms of technology diffusion, because along with the inflows of capital FDI often entails transfer of trade secrets in the form of tacit knowledge and know-how.

40. Columns 4 through 6 highlight the relationship of trade flows including services imports, foreign technological services imports (e.g., licensed technologies), and merchandise imports. In the case of services and foreign technological services, the regressions were run to examine first differences (i.e., the relationship of change in the TSPI to change in the variables of interest).[22] In each case the coefficient for stringency of trade secrets protection is positive and statistically significant. The GDP control variables are also significant. The positive relationship of TSPI to foreign technological services is notable, as this may reflect responsiveness in terms of transfer of technology, which can be growth enhancing.

6.3   Economic Assessment: Summing Up

41. In sum, the scatter plots and regression runs shown in the figure and table provide an indication of a positive relationship of the stringency of trade secret protection to key economic performance variables. It should be noted that this analysis considers association, but does not measure causality. Moreover, the results are the product of an empirical examination of the relationship for a specific sample and period of time. The results cannot necessarily be extrapolated and may vary under other conditions. Thus, care needs to be taken in consideration of these findings. Nevertheless, the results provide a promising indication of positive associations with the strengthening of trade secrets protection over the period examined here.

7. Conclusions

42. The analysis presented in this paper highlights the development of increased stringency of trade secrets protection over the past two decades in a broad sample of East and Southeast Asian economies. While the level of protection has increased, the regional average remains somewhat below that of the broad global sample of economies surveyed around the world.

43. There has been some convergence in the region with respect to increased availability and stringency for some aspects of protection such as certain types of available protection (e.g. under civil law), certain elements in the scope of available protection (e.g. breach of contractual duties), availability of certain remedies (e.g. preliminary injunctions and damages), and certain related policies (e.g. validity of non-competition clauses). On the other hand, there remains significant variation across these economies with respect to investigation and litigation, as well as some remedies (e.g. ex parte preliminary injunctions, ex parte search, and certain aspect of pre-trial discovery). In some economies, weakness in legal regimes with respect to these latter areas may influence the effectiveness of trade secrets protection.

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[22]   In the case of services imports and foreign technological services imports, the relationship of the level of stringency of trade secrets protection to the levels of imports was positive but not statistically significant. Rather, it appears that TSPI change may be influence change in these import levels.

44. The changes in the region and the global sample of economies with respect to the stringency of trade secrets protection appear to be associated with positive development in some indicators of economic performance such as R&D activity, FDI and trade imports. While the analyses do not demonstrate causality, they may provide an indication of positive developments associated with the investments made in the region to introduce or reform protection of trade secrets during recent decades.

ANNEX 1. THE TRIPS AGREEMENT ARTICLE ON UNDISCLOSED INFORMATION

Protection of undisclosed information is addressed in Article 39 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) of the World Trade Organization (WTO). This agreement entered into force on 1 January 1995 and established an international standard requiring WTO Members to protect undisclosed information including agricultural and pharmaceutical test data.

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Section 7: Protection of Undisclosed Information, Article 39
[of the TRIPS Agreement]

1. In the course of ensuring effective protection against unfair competition as provided in Article 10bis of the Paris Convention (1967), Members shall protect undisclosed information in accordance with paragraph 2 and data submitted to governments or governmental agencies in accordance with paragraph 3.[1, 2]

2. Natural and legal persons shall have the possibility of preventing information lawfully within their control from being disclosed to, acquired by, or used by others without their consent in a manner contrary to honest commercial practices[3] so long as such information:

   (a) is secret in the sense that it is not, as a body or in the precise configuration and assembly of its components, generally known among or readily accessible to persons within the circles that normally deal with the kind of information in question;

   (b) has commercial value because it is secret; and

   (c) has been subject to reasonable steps under the circumstances, by the person lawfully in control of the information, to keep it secret.

3. Members, when requiring, as a condition of approving the marketing of pharmaceutical or of agricultural chemical products which utilize new chemical entities, the submission of undisclosed test or other data, the origination of which involves a considerable effort, shall protect such data against unfair commercial use. In addition, Members shall protect such data against disclosure, except where necessary to protect the public, or unless steps are taken to ensure that the data are protected against unfair commercial use.

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1. These paragraph references refer to paragraphs 2 and 3 of Article 39 of the TRIPS Agreement.

2. In protecting Trade Secrets, the TRIPS Agreement references the protection provided in the Paris Convention against unfair competition. Article 10bis of the Paris Convention highlights the nature of protection against unfair competition. Signatories are bound to assure to nationals of such countries effective protection against unfair competition, including against acts such as those intended to create confusion or mislead the public or promulgate false allegations.

3. At this point in the original text, there is a footnote, numbered 10, that states:

   For the purpose of this provision, "a manner contrary to honest commercial practices" shall mean at least practices such as breach of contract, breach of confidence and inducement to breach, and includes the acquisition of undisclosed information by third parties who knew, or were grossly negligent in failing to know, that such practices were involved in the acquisition.

Source: Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), WTO.

ANNEX 2. SOURCES FOR ECONOMIC DATA AND POLICY CONDITIONS

1. OECD (2013 and 2014), *OECD.Stat*, (database); doi: 10.1787/data-00285-en.

- GDP real in USD (2005) converted at purchasing power parity exchange rates

2. World Bank (2013 and 2014), *World Development Indicators*, on-line edition, http://data.worldbank.org/data-catalog/world-development-indicators

- GDP deflator (for use in calculations of constant value)
- Population (for per capita calculations)
- Researchers in R&D, per million people (NB: 1996 data assumed constant, used for 1995)
- Resident and non-resident patent application data
- R&D as a percent of GDP
- Share of the labour force with tertiary education

3. Park (2008) and correspondence with the author, Walter Park, American University

- Patent rights index, an indicator of the strength of protection based on laws on the books: https://www.american.edu/cas/faculty/wgpark/upload/IPP-Research-Policy-May-2008-3.pdf

4. UNCTAD http://unctadstat.unctad.org/ReportFolders/reportFolders.aspx?s RF_ActivePath=P,5,27&sRF_Expanded=,P,5,27

- Foreign direct investment data

5. International Monetary Fund, Balance of Payments Statistics http://elibrary-data.imf.org/finddatareports.aspx?d=33061&e=170784

- Services imports, by sector

6. UN Comtrade Database http://comtrade.un.org/

- Merchandise trade data

7. Fraser Institute, *Economic Freedom of the World* dataset, 2013, http://www.freetheworld.com/release.html

- Chain-linked indices: Legal Structure and Property Rights (area 2), Freedom to Trade (area 4), and Regulation (area 5)

**ANNEX 3. ECONOMY-BY-ECONOMY SUMMARY OF
TRADE SECRET PROTECTION IN EAST AND SOUTHEAST ASIA**

1. **China**

The situation for trade secret protection in China is mixed. Over the past twenty years, China has enacted fairly comprehensive, modern trade secret laws providing for civil, criminal and administrative protection. The definitions it applies and the remedies it offers appear in principle to be generally aligned with certain post-TRIPs global standards. However, China has one of the lowest scores on the TSPI. This result is due to several well-documented aspects of its laws that clearly contradict otherwise theoretically strong protections.

The most notable challenge to enforcing trade secrets in China is the difficulty of obtaining evidence and proving one's case. China does not provide significant opportunities for discovery, yet the courts prefer documentary and physical evidence. This combination of factors is particularly difficult for a trade secret owner, since trade secret theft tends to be easily concealed and evidence is often in the hands of the defendant.

An expert commentator describes the situation thus:

> The evidentiary requirements for court actions in China are very stringent. Little weight is generally accorded to affidavits and witness testimonies while physical evidence and documentary evidence are favoured. Such evidence is difficult to obtain in trade secret infringement cases. This problem is compounded by the problems relating to the lack of a discovery process in the PRC. In the PRC system, each party needs to adduce sufficient evidence to prove its claims. Although the court has the power to assist parties to gather evidence, such power is rarely used. Particularly when a rightholder is trying to gather evidence of infringement from an established infringer where it is often difficult to gain entry, there may be undue hardship for the rightholder.[23]

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[23] Terrence F. MacLaren, Chiang Ling Li, 1 Trade Secrets Throughout the World § 8.52 (2012) (hereafter "MacLaren, Trade Secrets Throughout the World").

These evidentiary challenges lead experts to consistently recommend confidentiality agreements as absolutely necessary to protect trade secrets.[24] As another expert elaborates:

> Because there is no U.S.-style discovery in China, plaintiffs must collect and submit their own evidence to meet their burden of proof regarding, inter alia, trade secret misappropriation and damages. Chinese courts rarely accept evidence unless in its original form; therefore, documentary evidence is practically the only form of evidence that carries significant weight in a Chinese court. However, evidence obtained in violation of law is inadmissible in Chinese courts, and if admitted, it may constitute reversible error on appeal. Subsequently, it is essential to have a proper and thorough evidence gathering strategy to overcome the challenging evidentiary hurdles for a potential plaintiff in a trade secret misappropriation case. In some cases, it is challenging to obtain documentary evidence to prove misappropriation. In others, it may be difficult to prove that the potential defendant had access to confidential information.[25]

In the end, trade secret owners in China thus face a de facto requirement that trade secrets be reduced to writing accompanied by signed acknowledgements and other documentation. This limitation on the opportunity to protect trade thus effectively narrows both the scope and definition of trade secret law.

Another challenge for trade secret litigants is the rarity of preliminary injunctions against trade secret infringement in China. Experts observe that the standard is higher for preliminary relief in trade secret cases than for other forms of intellectual property. While remedies for copyrights, patents, and trade secrets were amended to comply with TRIPS, "trade secrets have not received similar treatment. No new civil remedy measure has been added. The old regulation of the 1991 Civil Procedure Law was left unchanged."[26]

The unavailability of preliminary relief is significant. Trade secrets are, by nature, fragile. A trade secret owner that is unable to promptly prevent use or disclosure of its trade secret may find the secret and its entire value destroyed.

Finally, it is worth noting that China is increasingly identified as an origin of threats to trade secrecy. For the sake of clarity, this issue should be distinguished from the protection of trade secrets within China, under Chinese law. The concern is more typically directed at Chinese entities targeting trade secrets outside of China. Thus, in February 2013, the Executive Office of the President of the United States released a report entitled "Administration Strategy on Mitigating the Theft of U.S. Trade Secrets."[27] The strategy collects other recent U.S. government reports, which identify China as posing a "pervasive threat" as one of the two most "aggressive collectors" (the other one identified was Russia) " of U.S.

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[24]   See ibid; MacLaren, Trade Secrets Throughout the World § 8.7 (2012); Shan Hailing, Protection of Trade Secrets Through IP and Unfair Competition Law, AIPPI Report Q215, China 10, 27, 34 (2010), available at https://www.aippi.org/download/commitees/215/GR215china.pdf.

[25]   Benjamin Bai & Guoping Da, Strategies for Trade Secrets Protection in China, 9 Northwestern Journal of Technology and Intellectual Property 351, 362 - 363 (2011).

[26]   Shan Hailing, Protection of Trade Secrets Through IP and Unfair Competition Law, AIPPI Report Q215, China 35 (2010), available at https://www.aippi.org/download/commitees/215/GR215china.pdf.

[27]   Executive Office of the President of the United States, Administration Strategy on Mitigating the Theft of U.S. Trade Secrets (February 2013).

economic information and technology."[28] Following release of the Administration Strategy, senior U.S. officials frequently cited China as a threat. Other governments have similarly singled out China as a source of trade secret theft.[29] For example, the head of Germany's military intelligence stated that one of his agency's main priorities was combatting industrial espionage from China and Russia.[30]

2. Chinese Taipei

Chinese Taipei first instituted statutory protection for trade secrets in two phases in 1992 and 1996. The trade secret law now provides a full array of remedies for both civil and criminal wrongs. Before 1992, any protection was purely contractual. Since the 1996 law, there have been some changes, but none that were particularly significant for purposes of this discussion until January 2013, when an amendment to the Trade Secrets Act introduced criminal liability for trade secret misappropriation and significantly increased fines for criminal violations.[31] One expert observed that "Prior to the recent amendments, there was only civil liability for trade secret theft in [Chinese Taipei], and the damages awarded were often too low to deter the misconduct."[32]

While many aspects of Chinese Taipei's trade secret laws reflect global standards, significant differences remain. The existence of an implied duty by employees and others to keep secrets is in doubt and has not been imposed by a court. This necessitates the use of written agreements with employees and business partners. Preliminary injunctions do not appear to be available on an ex parte basis.

The most significant issues that weaken trade secret protection in Chinese Taipei relate to investigation and discovery. Neither preliminary searches nor pre-trial discovery are available. It thus likely is difficult to obtain evidence necessary to prove a claim in many instances.

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[28]   Office of the National Counterintelligence Executive Report, Foreign Spies Stealing US Economic Secrets in Cyberspace 4 - 5 (2011).

[29]   Ibid at Appendix B-1.

[30]   Reuters, German Spy Chief Targets Russian, Chinese Industrial Espionage, 18 February 2013, http://www.reuters.com/article/2013/02/18/us-germany-spies-idUSBRE91H08C20130218.

[31]   Acts covered as crimes include: 1. Acquiring a trade secret by an act of theft, embezzlement, fraud, threat, unauthorized reproduction, or other wrongful means, or using or disclosing a trade secret so acquired; 2. Committing an unauthorized reproduction, usage, or disclosure of a trade secret known or possessed; 3. Failing to delete or destroy a possessed trade secret as the trade secret holder orders, or disguising it; 4. Any person who knowingly acquires, uses or discloses a trade secret known or possessed by others under the preceding 3 circumstances. Notably, under the amended law, breach of duty is not included in the list of acts covered as crimes.

    Fines for trade secrets theft can range from 1 million to 10 million New Taiwan Dollars and for using trade secrets in a foreign jurisdiction they can range from 3 million to 50 million New Taiwan Dollars. Jail terms can range up to 5 years for trade secrets theft and from 1 to 10 years for inappropriate use of trade secrets in a foreign jurisdiction.

[32]   Covington and Burling, LLP. The Case for Enhanced Protection of Trade Secrets In The Trans-Pacific Partnership Agreement. U.S. Chamber of Commerce. 20.

3. Hong Kong, China

Hong Kong, China, has no statutory protection for trade secrets, but provides well-developed civil law protection pursuant to common law. Since it has an English legal origin, Hong Kong's trade secret law is built on the same seminal trade secret cases as England's trade secret law, including *Coco v. A.N. Clark; Saltman Engineering Co. v. Campbell Engineering Company*; and *Exchange Telegraph Co. v. Central News Ltd.*[33]

Trade secret law in Hong Kong generally reflects modern norms, particularly as it follows updated English common law. For example, as the UK courts did in the case *Attorney-General v Guardian Newspapers Ltd (No.2) [1990] 1 AC 109*, Hong Kong's courts have expanded the scope of trade secret law beyond the older, traditional relationship-based view of trade secret law applied in older English cases. The 1994 case of *Linda Chih Ling Koo and John Ho Hung Chiu v. Lam Tai Hing*,[34] expanded the law to cover the actions unrelated third parties who misappropriate information. The law thus covers economic espionage, among other wrongful acts.

However, there are weaknesses. As in the United Kingdom, the largest omission is the lack of criminal sanctions. It also appears there are no standard, prescribed practices for protecting trade secrets in litigation.

4. Indonesia

Indonesia provides both civil and criminal protections for trade secrets in its statutory laws. In their broad scope and subject matter, these laws are near global norms, but there are significant uncertainties and omissions. Commentators complain that the law is too basic and underdeveloped. They criticize the lack of "[t]he elaboration of specific acts violating trade secret."[35] They also note that the law is vague and not fully applied:

> The current problem in our jurisdiction is that the regulation of trade secret protection in Law No. 30 of 2000 is very simple, not comprehensively provide rules for trade secret protection (only 19 Articles), therefore can cause uncertainty in business society, for IP protection. The legal system not fully applied and implemented as where are some factors such as legal culture, structure and substance influencing the law enforcement.[36]

Beyond this general critique, the law has some specific limitations. First, although it sanctions certain types of misappropriation by unrelated third parties, it does not reach all such instances. Thus, it sanctions procuring trade secrets through fraud, but not through the more common occurrence of corporate espionage. This arguably leaves businesses free to spy on competitors. Second, commentators note that ex parte preliminary injunctions are not, in fact, available.

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[33]   Coco v. A.N. Clark Eng'rs Ltd., [1969] RPC 41; Saltman Eng. Co. Ltd. v. Campbell Eng. Co. Ltd., [1968] 65 RPC 203; Exchange Telegraph Co. Ltd. v. Central News Ltd., [1897] 2 Ch. 48.

[34]   Linda Chih Ling Koo and John Ho Hung Chiu v. Lam Tai Hing, 1 HKLR 329 (1994) (holding that trade secrets are property rights and rejecting relationship-based view of trade secret duty).

[35]   Cita Citrawinda Noerhadi, Protection of Trade Secrets Through IP and Unfair Competition Law, AIPPI Report Q215, Indonesia 6-7 (2010).

[36]   Ibid.

The most significant issues that weaken trade secret protection in Indonesia relate to investigation and discovery. Neither preliminary searches nor pre-trial discovery are available. It thus likely is difficult to obtain evidence necessary to prove a claim in many instances.

Indonesia also has technology transfer regulations. License agreements must be registered with and approved by the government.

Finally, in addition to or because of the foregoing challenges, the law is not fully implemented or used. As of 2010, only one case had been brought under the Trade Secret Law.[37]

5. Japan

Among countries in Asia, Japan arguably has the longest history of protecting trade secrets. Before 1991, however, Japan protected trade secrets through its unfair competition laws and other statutes. It enacted its first comprehensive, express statutory protection for trade secrets in 1991. It added criminal penalties to the statute in 2003, although criminal sanctions were available by means of applying other statutory provisions prior to that date. There have been frequent revisions to these statutes in recent years, but only changes that will affect the TSPI score are discussed.

Japan's laws are comprehensive and strong, particularly relative to the rest of the region. However, a few caveats apply. Courts are slow to grant injunctions are slow and ex parte ones are not available:

> A holder of trade secret may exercise his right to seek injunction through a normal civil trial or the filing of a motion for preliminary injunction. However, in the case of a motion for preliminary injunction, it is legally necessary in principle that there is a court hearing with the presence of the respondent. Although the proceedings for preliminary injunction are faster than a normal civil trial, it usually takes several months before a ruling is made.[38]

Moreover, there are impediments to investigating infringement and gathering information. Both preliminary searches and pre-trial discovery are quite limited. It thus likely is difficult to obtain evidence necessary to prove a claim in many instances.

Trade secrets are also poorly protected during criminal litigation:

> At present, a challenge is how trade secretes should be protected in criminal proceedings in the case of a trial against a crime related to trade secret infringement. It is hoped that a system will be created to protect trade secrets in criminal proceedings, while respecting the constitutional requirements of openness of a trial.[39]

The lack of secrecy in criminal litigation discourages use of criminal proceedings:

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[37] Cita Citrawinda Noerhadi, Protection of Trade Secrets through IP and Unfair Competition Law, AIPPI Report Q215, Indonesia 6-7 (2010).

[38] Kazuo Ubukata, Question Q215: Protection of Trade Secrets Through IPR and Unfair Competition Law, AIPPI Report on Japan 8 (2010).

[39] Ibid at 19.

In reality, however, these criminal remedies are rarely used against the acts of trade secret infringement. One of the main reasons for this is that there is no system in place for preventing the publication of trade secrets to be tried in criminal proceedings, which is related to the fact that the openness of a trial is guaranteed by the Constitution.[40]

6. Korea

As Korea has become a leader in high technology manufacturing and innovation over the past two decades, it has greatly increased protection of trade secrets.[41] Before 1991, Korea provided very limited protection for trade secrets via enforcement of express contracts and other laws sanctioning wrongful acts incidental to trade secret theft. It enacted its first comprehensive, express statutory protection for trade secrets in 1991. It added criminal penalties to the statute in 2003, although criminal sanctions were available by means of applying other statutory provisions prior to that date.

Korea's laws now reflect global standards, but lag behind with respect to the conduct of litigation. There is no provision for an early, pre-litigation search to preserve proof. Moreover, pre-trial discovery is limited to production of documents at pre-trial hearings under the supervision of the court. Finally, there is very limited protection of trade secrets during the course of litigation. Hearings are not closed, and the only particular protection offered is the opportunity to protect the record, enacted in 2012. This lack of protection may lead to reluctance to litigate trade secret cases, at least where the infringed information is still kept confidential by the defendant and has not been revealed to the public or other competitors.

Finally, foreign businesses have noted a specific, subtle, but significant problem with how trade secrets are treated by Korean regulatory agencies. They complain that Korea requires particularly detailed disclosures for regulatory purposes, which they say have then leaked to competitors.[42] A 2011 Investment Climate Statement by the US Department of State observed:

> Korean laws on unfair competition and trade secrets provide a basic level of trade secret protection in Korea, but are insufficient in some instances. For example, some US firms, particularly certain manufacturers of chemicals, pet food, cosmetics, and food products, face continuing problems with government regulations requiring submission of very detailed product information, such as formula or blueprints, as part of registration or certification procedures. US firms report that, although the release of business confidential information is forbidden under Korean law, in some instances, government officials do not sufficiently protect this proprietary information, and trade secrets appear to have been made available to Korean competitors or to their trade associations.[43]

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[40]   Ibid at 9.

[41]   See also Hyun-Soo Kim, Trade secret law, intellectual property, and innovation: Theoretical, empirical, and Asian perspectives, PhD Thesis, University of Illinois (2011); Mirjana Stankovic, Trade Secrets: South Korea versus United States (2010), http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1678768.

[42]   AMCham Korea, Intellectual Property Rights (2004), http://www.amchamkorea.org/publications/2004ikbc/Intellectual%20Property%20Rights.doc.

[43]   2011 Investment Climate Statement – Republic of Korea, U.S. Department of State (March 2011), http://www.state.gov/e/eb/rls/othr/ics/2011/157359.htm.

7. Malaysia

Malaysia has no statutory protection for trade secrets, but provides civil law protection pursuant to common law. Since it has an English legal origin, Malaysia's trade secret law is built on the same seminal trade secret cases as England's trade secret law, including *Coco v. A.N. Clark; Saltman Engineering Co. v. Campbell Engineering Company*; and *Exchange Telegraph Co. v. Central News Ltd.*[44]

However, in contrast to Hong Kong and some other countries that share an English legal origin, the case law on trade secrets does not appear to have continued to develop along modern lines. As one commentator observed, "the applicable case law is not well developed. However, the broad principles established in the English cases and in particular *Coco v. Clark* may be equally applicable in Malaysia."[45] Beyond the uncertainty created by this lack of recent, local development, it also appears likely that Malaysia adheres to the older, traditional relationship-based view of trade secret law applied in older English cases. Therefore, the law would not apply to the actions of unrelated third parties who misappropriate information. The law thus covers employees and business partners, but does not sanction third party economic espionage, among other wrongful acts.

There are other omissions as well. There are no criminal sanctions. While Anton Piller orders appear to be available, discovery is somewhat restricted, as it is limited to documentary discovery under supervision of the court.

8. The Philippines

In theory, the Philippines provides statutory protection for trade secrets, but in practice commentators observe that trade secret owners must rely on express agreements to enforce trade secrets. There is no comprehensive statutory protection of trade secrets, and the existing provisions are specific and isolated to specific circumstances (e.g., duties of employees and professionals or interception of documents). Moreover, the existing statutes do not appear to be used according to expert commentary. The limited provisions that are directly applicable to trade secrets "are rarely cited for enforcement."[46] Although notable court cases have addressed and defined trade secrets, they have done so in tangential contexts, where trade secrets were protected in discovery or in a corporate control dispute.

Thus, experts discount the limited statutory protection that exists, and encourage parties to enter written agreements. A European Commission guide to trade secret protection for SMEs doing business in Asia describes the situation thus:

> There are laws that prohibit revelation of trade secrets (such as the Article 40 (e) of RA 7394 of the Consumer Protection act and Article 292 of the Revised Penal Code), however, these laws are rarely cited for enforcement. SMEs should take internal steps to protect any trade secrets by inserting confidentiality clauses into employee contracts, internally restricting access to sensitive information, and ensuring that confidential information is only revealed on a need-to-know basis.

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[44] Coco v. A.N. Clark Eng'rs Ltd., [1969] RPC 41; Saltman Eng. Co. Ltd. v. Campbell Eng. Co. Ltd., [1968] 65 RPC 203; Exchange Telegraph Co. Ltd. v. Central News Ltd., [1897] 2 Ch. 48.

[45] MacLaren, Trade Secrets Throughout the World § 25:7 (2012).

[46] European Commission, Guide on Trade Secrets: Protecting Your Trade Secrets in Southeast Asia (2013), available at http://www.asean-iprhelpdesk.eu/sites/default/files/publications/Trade-Secret-English.pdf

Given that laws on trade secrets are rarely brought to court in the Philippines, in the event that a criminal case is filed for violation of these laws, the Regional Trial Courts (RTC) – the highest trial courts in the Philippines – are unlikely to be familiar with this issue. In practice, parties tend to stipulate contractual obligations on trade secrets and, in the case of violations, resort to civil action for breach of contract and damages.[47]

The primary weakness of Filipino trade secret law thus lies in its fundamental definition and scope. There are no implied duties imposed on employees and business partners to keep secrets – all agreements must be express. Moreover, third parties cannot be liable for misappropriation of trade secrets.

Technology transfer provisions in the 1987 Constitution impose further challenges for foreign investors wishing to license or protect trade secrets. Foreign investments and joint ventures must be registered and are reviewed for approval. The particularly challenging provision, from the point of view of a foreign investor, is that restrictions on use of technology from foreign license may not run past end of agreement. Thus, every license agreement as well as every commercial or employment agreement with a confidentiality agreement amounts to a temporary form of protection, with a forced surrender of rights at the end of its term.

In sum, the situation is very difficult for foreign investors. They must rely on agreements to protect trade secrets. However, the obligation of the parties to those agreements to keep information confidential must end upon termination of the agreement. This situation makes investors very wary of entering into commercial relationships involving trade secrets. Several commentators describe the situation as protectionist, and not conducive to FDI.[48]

9. Singapore

The trade secret situation in Singapore is similar to other countries with English legal origins that have continued to develop and modernize their case law, such as Hong Kong. Singapore has no statutory protection for trade secrets, but provides well-developed civil law protection pursuant to common law. Since it has an English legal origin, Hong Kong's trade secret law is built on the same seminal trade secret cases as England's trade secret law, including *Coco v. A.N. Clark; Saltman Engineering Co. v. Campbell Engineering Company*; and *Exchange Telegraph Co. v. Central News Ltd.*[49]

Singapore's courts have expanded the scope of trade secret law beyond the older, traditional relationship-based view of trade secret law applied in older English cases. Although information must generally be imparted in confidence, courts have waived this requirement, at least where a defendant engaged in tortious or criminal act to obtain information it could not obtain legally. The courts have thus expanded the law to cover the actions of unrelated third parties who misappropriate information, at least where a tort or crime occurs.

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[47] European Commission, Guide on Trade Secrets: Protecting Your Trade Secrets in Southeast Asia (2013), available at http://www.asean-iprhelpdesk.eu/sites/default/files/publications/Trade-Secret-English.pdf

[48] Priscilla Tacujan (2013), Protectionist clauses in the Philippine Constitution restrict foreign direct investment, Journal of Political Risk, 1:1 (quoting several commentators).

[49] Coco v. A.N. Clark Eng'rs Ltd., [1969] RPC 41; Saltman Eng. Co. Ltd. v. Campbell Eng. Co. Ltd., [1968] 65 RPC 203; Exchange Telegraph Co. Ltd. v. Central News Ltd., [1897] 2 Ch. 48.

As a consequence, the law clearly covers many instances of economic espionage, among other wrongful acts. The doubt that remains is whether non-tortious economic espionage might be covered, as in the well-known U.S. case of *DuPont deNemours & Co. v. Christopher*,[50] where the defendant used extraordinary, but legal and non-tortious, means to "spy" on the plaintiff through aerial photography.

Trade secret law in Singapore generally reflects modern norms, particularly as it follows updated English common law. However, there are weaknesses. As in the U.K., the largest omission is the lack of criminal sanctions. There are also concerns regarding the protection of trade secrets in litigation. While standard practices exist for such protection (protective orders, closed hearings), there are concerns about the level of specificity with which trade secrets must be pled and revealed to the court and opposing parties.

One commentator describes how recent case law raises this concern:

> The Court in *Johnson Pacific Pte Ltd v. Hogberg Fred Rickard Robin [2004] 4 SLR 200* held that in respect of breach of confidence, the plaintiffs must provide all the particulars sought of the allegations of breach of confidence in their statement of claim as it is only fair that the defendants know the information they are attacked for using. As to secret process that is alleged to be used by the defendant, the Court held that a defendant is entitled to particulars as to what features of the process are alleged to be secret. The court may order an inspection of the process by an expert as a substitute for such particulars with a duty to explain to the expert what elements are claimed to be secret and why. In an action for misuse of trade secrets it is necessary for the plaintiff to specify what secrets are relied upon.[51]

The need to make such specific disclosure may deter plaintiffs from using the court system. However, it should be noted that this is a nearly universal concern in trade secret litigation, and appears to be only slightly heightened by the marginally higher level of disclosure required by courts in Singapore.

10. Thailand

Trade secret protection is a relatively new phenomenon in Thailand. Commentators date the start of Thai trade secret protection to 2002. Before that date, the primary protection for trade secrets was express contract.

The Trade Secret Act provides comprehensive civil and criminal protection that in many ways reflects global standards, but significant omissions remain. First, the scope of the law is limited in some important respects. It does protect against both breach of duty by related parties and third party misappropriation by unrelated parties. However, a party with authorized access to a trade secret (e.g., a business partner or employee) will not be said to have breached its duty in the absence of an express, written agreement. Therefore, employees and business partners without express contractual duties to keep secrets may not be liable, even in situations where they abuse positions of trust.

Thailand provides for criminal sanctions. However, the defendant must intend to inflict damage on the business of the trade secret owner. This may slightly narrow the scope of criminal protection from what is

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[50]   E.I. DuPont deNemours & Co. v. Christopher, 431 F.2d 1012 (5th Cir. 1970).

[51]   MacLaren, Trade Secrets Throughout the World § 33:33 (2012).

more typical, as it is possible for a trade secret defendant to intend to make a profit or reduce costs for itself rather than harm its competitor. This might particularly be the case where the trade secret is "negative knowledge" – e.g., knowledge about processes and materials that do not work well. It can be costly for the owner to acquire such information through trial and error, and beneficial for a misappropriator to enjoy the short cut of avoiding the process of acquiring it, but there likely would be no intent to harm the plaintiff's business.

The most significant issues that weaken trade secret protection in Thailand relate to investigation and discovery. Preliminary searches to preserve proof are not available, and pre-trial discovery is limited. It thus likely is difficult to obtain evidence necessary to prove a claim in many instances.

Expert commentary does not express confidence in the administration of the law. They note that application of the Trade Secrets Act has been limited in practice and report that as of 2010, there had been no prevailing plaintiffs:

> only a few cases have been brought before the courts for the breach of confidentiality obligations. In those few cases, it was determined by the court that the parties who brought the cases had failed in their duty to keep their trade secrets confidential and as a result the subject matter was no longer a trade secret, thus, there was no violation.[52]

Another commentator observed that "although IP Prosecutions are very high, corruption and cultural climate of leniency can complicate some phases of case administration."[53]

11. Vietnam

Trade secret protection in Vietnam is a new phenomenon. Vietnam instituted trade secret protection in two phases, with a 2000 law providing a definition and creating a right to administrative remedies. More extensive protection came with a 2005 allowing for civil actions. Before 2000, trade secrets were not covered by law in Vietnam. While it may have been possible to protect them via contract, it is hard to say whether such a contract would have been effective because Vietnam began a transition to a more open economy in the 1980s and 1990s, but that transition was still in early stages.

Vietnam provides comprehensive civil and administrative protection of trade secrets. In theory, there may be criminal protection,[54] but in practice, there is not. As one commentator put it, "infringement can be criminalised. However, due to lack of guidance and the inconsistency in the legal system, criminal action is not usually feasible in practice."[55] Nevertheless, the relatively unusual provision for administrative protection may, in many cases, serve as similar function to criminal prosecution. Although jail sentences are not available as administrative remedies, state agencies possess the power to investigate and fine violations, much as a prosecutor and criminal court would do.

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[52]   Say Sujintaya, *Protection of Trade Secrets through IP and Unfair Competition Law*, AIPPI Report Q215, Thailand 8 (2010).

[53]   *Thailand: Country Study Guide*. (International Business Publication, USA) 2008 4th ed.

[54]   Although Article 212 of IP Law 50/2005 states that "Individuals who have committed acts of infringement of intellectual property rights having factors that constitute a crime shall be liable to the criminal liabilities in accordance with the criminal laws and regulations," there are no provisions defining trade secret infringement as crimes. In any event, experts observe that criminal remedies are not used.

[55]   European Commission, ASEAN IPR SME Helpdesk, IP Country Factsheet: Vietnam 1 (2013)

The most significant shortcoming with respect to trade secret law in Vietnam most likely is the difficulty in investigating and obtaining evidence of infringement. Preliminary searches to preserve evidence are available, but a procedure has not yet been specified. Most significantly, pre-trial discovery is not available. This difficulty in obtaining proof is likely to limit the use of civil actions.

In addition, so far, experience with trade secret enforcement in Vietnam is very limited. As one commentator observed recently: "It is worth noting that, as trade secrets are a relatively new addition to Vietnamese IP law, the Vietnamese authorities have not yet to date dealt with any infringement cases relating to trade secrets."[56]

12. Other Countries

Laos. Laos enacted an Intellectual Property Law in 2011. At this time, experience and implementation, as well as commentary on the law, is too limited to give a full account of the law.[57]

Brunei, Cambodia[58] and Myanmar. These countries have yet to develop trade secret laws as such. Some limited protection may be provided by means of express agreements with employees and business partners. Such protection does not impose implied duties on employees and business partners without express agreements. Moreover, it does not reach third parties who misappropriate trade secrets through tort, crime, or other surreptitious means. Cambodia is currently considering a draft law.

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[56] European Commission, ASEAN IPR SME Helpdesk, IP Country Factsheet: Vietnam 7 (2013).

[57] ASEAN IPR SME Helpdesk, Guide on Trade Secrets: Protecting Your Trade Secrets in Southeast Asia (2013).

[58] Cambodia is currently considering a new draft IP Law that would cover trade secrets. European Commission, ASEAN IPR SME Helpdesk, Guide on Trade Secrets: Protecting Your Trade Secrets in Southeast Asia (2013).

ANNEX 4. CHART, TABLES AND FIGURES

Chart A.1. Trade Secrets Protection Index

Components and scoring	Score range	Normalised score
1. Definition and Coverage	**0-13**	**0-1**
a) Scope		
• If scope covers all confidential business information, subject to: 1) deriving value from secrecy and 2) the owner's reasonable efforts to maintain secrecy, score = 1; If scope also subject to requirement that information is imparted to the recipient in confidence, score = ½	0, 1	
b) Additional Elements of Definition		
• Inventory of trade secrets required (requirement=0; no requirement=1)	0, 1	
• Must be reduced to writing (requirement=0; no requirement=1)	0, 1	
• Must be identified as a trade secret to recipient (requirement=0; no requirement=1)	0, 1	
• Written notice to recipient required (requirement=0; no requirement=1)	0, 1	
c) Acts covered as civil infringement:		
• Breach of duty (not covered=0, partially covered=½ [59], covered=1)	0, 1	
• Wrongful acquisition or misappropriation (not covered=0, covered=1)	0, 1	
• Third party liability for acquisition with knowledge or reason to know (not available=0, available=1)	0, 1	
• Third party liability for acquisition without knowledge - enjoin "innocent parties" (not available=0, available=1)	0, 1	
d) Acts covered by criminal law		
• Breach of duty (not covered=0, partially covered=½, covered=1)	0, 1	
• Wrongful acquisition or misappropriation (not covered=0, covered=1)	0, 1	
• Third party liability for acquisition with knowledge or reason to know (not available=0, available=1)	0, 1	
• Third party liability for acquisition without knowledge, enjoin "innocent parties" (not available=0, available=1)	0, 1	

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[59]   E.g. the duty of confidentiality might be imposed on employees, fiduciaries and third parties with access to information. Partial coverage might arise if under a country's legal regime licensees cannot be covered.

Components and scoring	Score range	Normalised score
2. Specific duties and misappropriation[60]	**0-5**	**0-1**
• Commercial relationship (covered if arising from: express agreement ½ + implied duty ½)	0, 1	
• Current employment relationship (covered if arising from: express agreement ½ + implied duty ½)	0, 1	
• Past employment relationship (covered if arising from: express agreement ½ + implied duty ½)	0, 1	
• Restrictions on post-relationship duty of confidentiality (if any restrictions on matters beyond general skills and knowledge, by relationship: commercial ½ + employment ½)	0, 1	
• Validity of contractual restrictions on competition (if unenforceable=0, significant limitations=½ (e.g., limited by time or place for either commercial or post-employment situations), generally enforceable=1)	0, 1	
3. Remedies and Restrictions on liability	**0-11**	**0-1**
a) Restrictions on liability		
• Additional elements of proof in infringement claims (if none: civil=½ + criminal=½, criminal ½ point; score 1 if there no criminal law and civil score is ½)	0, 1	
b) Civil remedies		
• Preliminary injunction (if available = 1, if not = 0)	0, 1	
• Ex parte action available under preliminary injunction (if available = 1, if not = 0)	0, 1	
• Permanent injunction (if available = 1, if not = 0)	0, 1	
• Injunction to eliminate wrongful head start (if available = 1, if not = 0)	0, 1	
• Delivery or destruction of infringing materials (if available = 1, if not = 0)	0, 1	
• Compensatory damages (direct or out of pocket damages or consideration of profits or other damages= 1)	0, 1	
• Yielding of defendant's profits (if available = 1, if not = 0)	0, 1	
• Availability of punitive or statutory damages (if available = 1, if not = 0)	0, 1	
c) Criminal remedies		
• Fines, damages or loss of assets (if not available = 0, if minimal per expert opinion= ½, if substantial = 1)	0, 1	
• Jail sentence (if available = 1, if not = 0)	0, 1	

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[60] The treatment of duties is split within this framework. General coverage of duties is scored under index component 1 (Definitions & Coverage). Component 2 responds to the availability of recourse for specific duties. This permits a detailed assessment, ensuring the indicator responds to variation in key elements.

Components and scoring	Score range	Normalised score
4. Enforcement, investigation and discovery; data exclusivity a) Enforcement, investigation and discovery	**0-6**	**0-1**
• Emergency search to preserve and obtain proof (unavailable=0, available but with significant restrictions= ½ (e.g., conducted solely by an official or 3rd party expert), readily available=1)	0, 1	
• Ex parte emergency search availability (unavailable=0, available but with significant restrictions=½, readily available=1)	0, 1	
• Pre-trial discovery (unavailable=0, documentary only or strict limitations = ½, ready availability of documentary and interrogatories = 1)	0, 1	
• Protection of confidentiality of trade secrets in litigation (none=0, partial= ½, fully available=1)	0, 1	
b) Data exclusivity		
• Drugs (years: 0=0; 0.1-3=1/3; 3.1-7.9=2/3; >8=1)	0, 1	
• Agricultural chemicals (years: 0=0, 0.1-4.9=1/3; 5-8=2/3; > 8=1)	0, 1	
5. System functioning and related regulation	**0-4**	**0-1**
• Technology transfer: registration requirement (none=1; one or more = 0)	0, 1	
• Technology transfer: substantive review or regulation (none=1; one or more = 0)	0, 1	
• Fraser Institute score for *Legal System and Security of Property* Rights (score ranging from 0 to 10, divided by 10)[61]	0, 1	
• Expert characterisation of the operation of the protection in practice (NB, based on internationally recognised or peer-reviewed sources; see country charts for details) (Negative = 0; none = ½; positive = 1)	0, 1	
		=======
Index Total		**0-5**

Source: Schultz and Lippoldt (2014).

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[61] The Fraser Institute (2012, pp. 3 and 273-5) score for *Legal System and Security of Property Rights* is a composite indicator produced annually. Scores can range from 0 to 10. Based on objective indicators and expert assessments, it takes into account judicial independence, impartiality of courts, protection of property rights, military interference in the rule of law and politics, integrity of the legal system, legal enforcement of contracts, regulatory restrictions on the sale of real property, reliability of the police and business costs of crime. For details see Annex 1 of the present report and http://www.freetheworld.com/reports.html.

Table A.1. Trade Secrets Protection Index, by economy and index component, 2010

Components and scoring	1. Definition and coverage	2. Duties and misappropriation	3. Remedies and restrictions on liability	4. Enforcement, investigation and discovery; data exclusivity	5. System functioning and related regulation	Totals
Normalised range	0-1	0-1	0-1	0-1	0-1	0-5
Argentina	0.81	1.00	0.64	0.08	0.60	3.12
Australia	0.65	1.00	0.64	0.86	0.84	3.99
Brazil	0.77	0.80	0.86	0.75	0.13	3.31
Bulgaria	0.46	0.60	0.36	0.92	0.62	2.96
Canada	0.69	1.00	0.82	1.00	0.97	4.48
China	0.62	0.60	0.55	0.55	0.40	2.71
Chinese Taipei	0.85	0.60	0.82	0.30	0.55	3.12
Colombia	0.85	0.90	0.55	0.39	0.47	3.15
France	0.77	0.90	0.64	0.75	0.70	3.76
Germany	0.85	0.90	0.73	0.58	0.71	3.76
Ghana	0.62	1.00	0.55	0.50	0.77	3.43
Hong Kong, China	0.62	0.90	0.73	0.83	0.95	4.03
India	0.50	0.90	0.73	0.64	0.16	2.92
Indonesia	0.69	1.00	0.64	0.08	0.11	2.52
Ireland	0.62	1.00	0.73	0.83	0.97	4.15
Israel	0.65	1.00	0.64	0.86	0.93	4.08
Italy	0.69	0.90	0.77	0.83	0.65	3.85
Japan	0.85	1.00	0.82	0.67	0.94	4.27
Korea	0.77	1.00	0.82	0.44	0.78	3.81
Latvia	0.85	0.70	0.73	0.58	0.79	3.64
Lithuania	0.92	1.00	0.82	0.92	0.78	4.44
Malaysia	0.50	0.80	0.68	0.69	0.80	3.48
Mexico	0.77	0.70	0.73	0.39	0.74	3.32
Netherlands	0.85	0.70	0.91	0.92	0.85	4.22
New Zealand	0.62	1.00	0.77	0.80	0.85	4.04
Peru	0.77	0.80	0.64	0.61	0.25	3.06
Philippines	0.35	0.70	0.68	0.50	0.22	2.45
Russia	0.54	0.50	0.82	0.50	0.11	2.47
Singapore	0.69	1.00	0.68	0.80	0.83	4.00
South Africa	0.62	1.00	0.73	0.50	0.30	3.14
Spain	0.85	1.00	0.82	0.83	0.92	4.42
Sweden	0.69	0.70	0.73	0.58	0.86	3.56
Thailand	0.85	0.70	0.95	0.17	0.75	3.42
Turkey	0.85	1.00	0.73	0.22	0.62	3.41
United Kingdom	0.62	1.00	0.59	0.92	0.84	3.97
United States	0.85	0.90	1.00	0.94	0.80	4.49
Vietnam	0.62	0.30	0.73	0.72	0.65	3.01
Overall Average	0.70	0.85	0.72	0.63	0.65	3.57
Average: East & Southeast Asian Economies	0.67	0.78	0.74	0.52	0.63	3.35

Table A.2. Trade Secret Protection Index: statistics scoring using alternative weights, 2010

	Total Scories, by Weighting Scheme		
	Equal weights: 20% for each component	40% for enforcement, investigation, discovery and data exclusivity; 60% divided equally amon the other components	40% for Remedies and restrictions on liability; 60% divided equally among the other components
Argentina	3.12	2.45	3.14
Australia	3.99	4.07	3.79
Brazil	3.31	3.42	3.56
Bulgaria	2.96	3.37	2.68
Canada	4.48	4.61	4.38
China	2.71	2.72	2.71
Chinese Taipei	3.12	2.72	3.36
Colombia	3.15	2.84	3.04
France	3.76	3.75	3.61
Germany	3.76	3.55	3.73
Ghana	3.43	3.20	3.25
Hong Kong, China	4.03	4.06	3.93
India	2.92	2.99	3.10
Indonesia	2.52	2.00	2.69
Ireland	4.15	4.15	4.02
Israel	4.08	4.13	3.85
Italy	3.85	3.93	3.85
Japan	4.27	4.04	4.22
Korea	3.81	3.41	3.88
Latvia	3.64	3.46	3.64
Lithuania	4.44	4.47	4.35
Malaysia	3.48	3.48	3.46
Mexico	3.32	2.97	3.40
Netherlands	4.22	4.31	4.31
New Zealand	4.04	4.04	4.00
Peru	3.06	3.06	3.09
Philippines	2.45	2.46	2.69
Russia	2.47	2.48	2.87
Singapore	4.00	4.01	3.86
South Africa	3.14	2.98	3.27
Spain	4.42	4.36	4.34
Sweden	3.56	3.40	3.58
Thailand	3.42	2.77	3.76
Turkey	3.41	2.83	3.47
United Kingdom	3.97	4.12	3.71
United States	4.49	4.55	4.62
Vietnam	3.01	3.16	3.17
Average for E and SE Asia	3.35	3.17	3.43
Overall Average	3.57	3.47	3.58
Max	4.49	4.61	4.62
Median	3.56	3.42	3.61
Min	2.45	2.00	2.68
Standard Deviation	0.59	0.69	0.52
Coefficient of Variation	0.17	0.20	0.15
Correlation Coefficient (equal weight scores versus alternate schemes)		0.94	0.96
Spearman Rank Correlation (equal weight scores versus alternate schemes)		0.92	0.96

Table A.3. Trade Secrets Protection Index, by economy and year, 1985-2010

	1985	1990	1995	2000	2005	2010
Argentina	2.16	2.19	2.18	3.16	3.12	3.12
Australia	3.81	3.81	4.00	4.01	4.00	3.99
Brazil	2.27	2.28	2.27	3.15	3.30	3.31
Bulgaria			2.65	2.64	2.63	2.96
Canada	4.12	4.14	4.43	4.44	4.42	4.48
China		0.90	1.78	2.22	2.69	2.71
Chinese Taipei	2.10	2.10	2.57	2.88	3.00	3.12
Colombia	2.84	2.84	2.83	2.92	3.15	3.15
France	3.40	3.71	3.70	3.72	3.71	3.76
Germany	3.26	3.77	3.78	3.78	3.78	3.76
Ghana	3.24	3.32	3.33	3.29	3.41	3.43
Hong Kong, China	3.87	3.86	4.03	4.01	4.03	4.03
India	2.83	2.82	2.86	2.86	2.89	2.92
Indonesia	1.77	1.78	1.75	2.50	2.52	2.52
Ireland	3.76	4.01	4.04	4.04	4.15	4.15
Israel	3.59	3.53	3.59	3.82	4.08	4.08
Italy	3.54	3.56	3.53	3.56	3.85	3.85
Japan	4.06	4.07	4.17	4.17	4.17	4.27
Korea	2.16	2.19	3.08	3.69	3.82	3.81
Latvia			2.70	3.32	3.65	3.64
Lithuania			3.22	4.11	4.44	4.44
Malaysia	3.46	3.46	3.47	3.44	3.48	3.48
Mexico	1.67	1.95	3.34	3.32	3.33	3.32
Netherlands	3.87	4.21	4.22	4.24	4.23	4.22
New Zealand	3.59	3.60	3.62	3.62	4.04	4.04
Peru	2.64	2.66	2.93	2.98	2.99	3.06
Philippines	2.75	2.41	2.48	2.47	2.46	2.45
Russia			1.19	1.63	2.47	2.47
Singapore	3.76	3.76	3.79	3.79	4.01	4.00
South Africa	3.08	3.04	3.12	3.13	3.15	3.14
Spain	2.61	2.85	4.32	4.32	4.42	4.42
Sweden	2.28	3.54	3.55	3.55	3.55	3.56
Thailand	2.28	2.29	2.27	2.28	3.44	3.42
Turkey	3.22	3.19	3.20	3.21	3.43	3.41
United Kingdom	3.47	3.83	3.85	3.98	3.98	3.97
United States	4.11	4.11	4.12	4.54	4.50	4.49
Vietnam					3.01	3.01
> Overall Average <	3.08	3.12	3.22	3.41	3.56	3.58
> Average: East & Southeast Asian Economies <					3.33	3.35

Table A.4. Illustrative modelling of the relationship of TSPI to selected economic performance indicators (all variables entered as natural logarithms)

	(1) Real R&D, per capita (constant USD, 2005)	(2) R&D personnel, as % of the labour force	(3) Real FDI inflows (constant USD, 2005) *variables entered as first differences*	(4) Change in real services imports, per capita (constant USD, 2005); all *variables entered as first differences*	(5) Change in real foreign technological services imports (e.g., licencing & royalty payments for intangibles), constant USD (2005); all *variables entered as first differences*	(6) Real merchandise imports (constant USD, 2005)
TSPI	0.469547 **		1.494783 ** *0.608775*	0.551834 ** *0.228515*	1.380278 ** *0.568653*	0.664822 ** *0.258105*
TSPI lagged 1 period	0.195527					
Interact (TSPI x Patent Rights Index)		0.583355 ** *0.248242*	2.047991 *** *0.313472*			
GDP per capita (real, USD 2005)		0.782631 *** *0.293873*				
GDP (real, USD 2005 ppp)	1.170749 *** *0.128488*	0.279946	2.472000 *** *0.279946*		1.419025 ** *0.697704*	1.231150 *** *0.097923*
Market Regulation (Fraser Institute)	-0.174773		1.412879 ** *0.664468*		0.857275 *0.426688*	
Share of labour force with tertiary education	0.304992		0.778480 *** *0.219858*		0.682397 *0.285595*	
Country Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Periods included	4	5	5	5	5	5
Years	1995-2010	1990-2010	1990-2010	1990-2010	1990-2010	1990-2010
Adjusted R2	0.987531	0.902006	0.953125	0.421721	0.407905	0.971826
Countries Covered (see note)	24	20	23	23	23	24
N	80	82	64	109	93	110

Notes: Standard errors are shown above in italics. For each regression run (1 to 6), the country coverage is shown below (with East and Southeast Asian countries shown in bold);

(1) Australia, Canada, **China**, Colombia, France, Germany, India, **Indonesia**, Ireland, Israel, Italy, **Japan, Korea,** Mexico, Netherlands, New Zealand, Russia, **Singapore,** South Africa, Spain, Sweden, Turkey, United Kingdom and United States.

(2) Australia, Canada, **China**, France, Germany, Ireland, Israel, Italy, **Japan, Korea,** Mexico, Netherlands, New Zealand, Russia, **Singapore,** South Africa, Spain, Sweden, Turkey and United Kingdom.

(3) Australia, Canada, **China**, Colombia, France, Germany, **Indonesia,** Ireland, Israel, Italy, **Japan, Korea,** Mexico, Netherlands, New Zealand, Russia, **Singapore,** South Africa

Figure A.1. Trade Secrets Protection Index, by economy and year (economies sorted by rank in 2010)

Legend: ■ 1985 ■ 1990 ☐ 1995 ☐ 2000 ▨ 2005 ▤ 2010

Economies (top to bottom): United States, Canada, Lithuania, Spain, Japan, Netherlands, Ireland, Israel, New Zealand, Hong Kong, China, Singapore, Australia, United Kingdom, Italy, Korea, Germany, France, Latvia, › Overall Average ‹, Sweden, Malaysia, Ghana, Thailand, Turkey, › Average: E & SE Asian Economies ‹, Mexico, Brazil, Colombia, South Africa, Argentina, Chinese Taipei, Peru, Vietnam, Bulgaria, India, China, Indonesia, Russia, Philippines