PhAMA

'Innovative Medicines for Malaysia'

Intellectual Property, Innovation And Competitiveness :

PART 2

CONTENTS

PhAMA
'Innovative Medicines for Malaysia'

Executive Summary

A strong IP regime is critical for Malaysia as a developing country to boost its competitiveness, especially to attract FDI while at the same time encouraging innovation. On a micro level, strong IP rights granted to innovators have enabled innovators to reap the fruits of their innovation. On a macro level, IP rights have encouraged innovators to create inventions that have benefitted mankind and society.

In relation to the pharmaceutical industry, IP rights granted to pharmaceutical companies have allowed them to flourish, and in the process have also enabled these companies to continuously innovate in the field of health and science, improving the quality of life of the average human being.

In Malaysia's quest to become a high-income nation, Malaysia has to be able to attract FDI and at the same time, encourage technological advancement and innovation. As studies have shown that there is a positive correlation between the strength of IP rights and FDI, policymakers will have to bear in mind that weak IP rights make the country less attractive for foreign investors.

However, Malaysia must not focus on merely attracting FDI – the country must attract high quality FDI with more R&D expenditure and value added exports. FDI will provide more benefits to Malaysia if the investors apply advanced technology as opposed to less technologically intensive applications.

Since technological advancement lies at the heart of economic growth, policy makers have been giving priority to R&D. The proposition that IP rights will only benefit patentees from developed countries and are detrimental to local entities is flawed because such an argument undermines the ability of locals to innovate, and fails to take into account the technology transfer or diffusion that occurs when foreign entities, bringing with them intellectual capital, invest in the country. A weak IP regime will not only deter FDI in high technology sectors, it will also tilt the focus of FDI projects from manufacturing to distribution.

South Korea and Taiwan are two examples of conscious effort by the government to develop local technological capabilities instead of relying substantially on foreign FDI. South Korea and Taiwan first started off as imitators of Japanese and American technology, however, today they have emerged as innovators in their own right. The South Korean and Taiwanese experience is something that the Malaysian government should consider emulating as Malaysia is still lagging behind in terms of innovation and R&D spend.

Malaysia has achieved so much in the past 50 years, and is not lacking in companies or talented individuals capable of innovation. It is well-positioned to make the progress from an upper-middle income economy to a high income economy with the right policy and implementation in place, which must include strengthening its present IP regime, and not tolerating any call to dilute or weaken the existing rights that are already in place.

2.1 Innovation and the Pharmaceutical Industry

The impact of IP rights cannot be studied in isolation and much of its effects are related to economics - IP rights are, after all, proprietary, with an objective to "create incentive that maximize the difference between the value of the intellectual property that is created and used and the social cost of its creation, including the cost of administering the system."[1]

In this part of the Position Paper, it will be shown that a strong IP regime is critical for Malaysia as a developing country to boost its competitiveness, enabling her to better compete with other countries, particularly countries with the same "developing" status, especially for foreign direct investment (FDI) and at the same time encourage innovation.

The case studies highlighted provide an insight into how IP rights have enabled innovators in the pharmaceutical industry reap the fruits of their innovation. IP rights and patents in particular, are critical to the development of new drugs and are key enablers to incentivize pharmaceutical companies to invest in R&D. Even the most hardened critic will have to admit that the pharmaceutical industry has contributed towards making life more livable for the average person, increasing the average person's lifespan and quality of life.

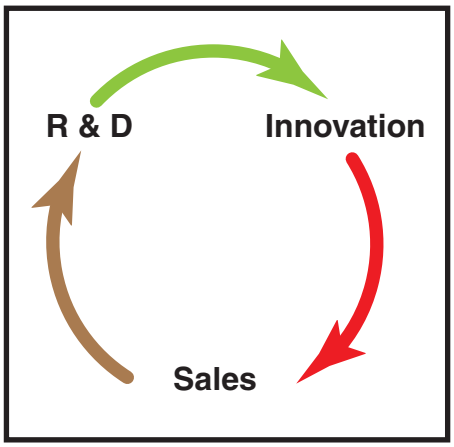


Figure 1 The R & D cycle of a typical innovator pharmaceutical company

Similar to other industries, pharmaceutical companies also rely on IP rights to capitalize on their innovation. However, IP rights, especially patents, are of particular significance to innovator companies in the pharmaceutical sector.

A strong IP regime which supports innovation contributes to overall increase in the quality of life and life expectancy of the average human being by motivating and enabling pharmaceutical companies to innovate and create new breakthrough drugs to treat diseases. The stories about the pharmaceutical companies, their researchers and drugs below will show how a strong IP regime has contributed not only to combating diseases but also significantly improved the livelihood of the inventors, researchers and workforce of the pharmaceutical companies as well as society at large.

[1] Stanley M. Besen and Lep J. Raskind, "An introduction to the Law and Economics of Intellectual Property",(1991) 5 Journal of Economic Perspectives 3 at page 5

Pfizer Inc.[2]

The story of Pfizer began with two cousins, Charles Erhart, a confectioner and Charles Pfizer, a chemist in a two story brick building on Bartlet Street in Brooklyn, New York. The company's venture into R&D resulted in a process for fermenting citric acid by the fermentation of sugar, a process known as SUCIAC (sugar to citric acid conversion), making lemons unnecessary in the production of citric acid. Since then, Pfizer has made various contributions to the medical world as a result of its R&D success, and gave the world, inter alia, the anti-inflammatory drug Feldene (piroxicam), Glucotrol (glipizide), a drug for diabetes, and Zoloft (Sertaline hydrocholode), a drug treating depression.

Lloyd Conover[3]
Invention: Tetracyline

One of Pfizer's many inventions and discovery was the antibiotic Tetracycline, discovered by a member of Pfizer's research team, Lloyd Conover. He joined Pfizer from the University of Rochester to explore the chemistry of the antibiotics Terramycin and Aureomycin. Tetracycline was discovered by Lloyd Conover in 1952 by chemically transforming Aureomycin. This invention was subsequently patented. As a result of this discovery, a new avenue opened for antibiotic research as most subsequent antibiotic discoveries have been made by chemically modifying prototype antibiotics. For the next 60 years, the strategy for the discovery of new tetracyclines has not substantially changed, and eventually led to the creation of the important and now generic antibiotics doxycycline and minocycline.[4]

[2] Story on Pfizer extracted from Joseph G. Lombardino "A brief history of Pfizer Central Research" (2000) 25 Bull. Hist. Chem. 1 at pages 10 -15

[3] Story on Lloyd H Conover extracted from "Inductee: Lloyd H Conover, Tetracycline" *< http://invent.org/inductee-detail/?IID=32 >* accessed 25 November 2014

[4] Andrew G Myers Research Group " Tetracyclines" *< http://faculty.chemistry.harvard.edu/myers/pages/tetracyclines >* accessed 25 November 2014

2.2 The Malaysian Economy

The suitability of policies in relation to IP is based on multiple factors; hence, to put things in perspective, some facts and figures on Malaysia's economy are as presented below[5] :

The World Bank categorizes Malaysia as a "highly open upper-middle income economy"[6] – Malaysia has recorded impressive growth rates, with an average growth rate of more than 7 per cent per year for 25 years or more[7] . Moving forward, the Malaysian government has aspirations to turn Malaysia into a high-income nation, as put forth in its 10th Malaysia Plan (2011 to 2015).

Facts and Figures of Malaysia Economy

GDP	USD 312.5 billion (2013)
GDP per capita	USD 10,500 (2013)
Exports / GDP	83 percent (2013)
Doing Business 2015 Ranking	18th (out of 189 economies)
Poverty Rate (share of households below the national poverty line)	1.0 percent (2014)
Gini coefficient (income)	0.41 (2014)
Unemployment rate	2.7 percent (October 2014)

(Source: World Bank)

However, as pointed out by Jimenez et al., while Malaysia has surpassed the income per capita of Indonesia and the Philippines (at one point the income per capita of the three countries was comparable), there is no indication that Malaysia is catching up with high income economies like South Korea and Japan[8]. Malaysia is now in the "middle income trap" – it is easier to move from a low-income to middle income economy than to move from a middle income to a high income economy[9]. To get out of this "trap", Malaysia has to change what it has been doing economically for the past 40 years.[10]

[5] The World Bank "Malaysia Overview" (23 January 2015) < *http://www.worldbank.org/en/country/malaysia/overview*> Accessed on 26 January 2015

[6] ibid

[7] The World Bank "The Growth Report : Strategies for Sustained Growth and Inclusive Development" (Commission on Growth and Development, World Bank, 2008) page 1

[8] Emmanuel Jimenez et al, "Stuck in the middle? Human Capital Development and Economic Growth in Malaysia and Thailand" (Policy Research Working Paper 6283, World Bank, 2012)< *http://elibrary.worldbank.org/doi/pdf/10.1596/1813-9450-6283* > accessed 19 September 2014

[9] Michael Schuman "Escaping The Middle Income Trap" Times (10 August 2010) <*http://business.time.com/2010/08/10/escaping-the-middle-income-trap/*> accessed 19 September 2014

[10] ibid


bal economy

2.3 Foreign Direct Investment

The Malaysian government has recognized the importance of FDI in Malaysia's economic growth and in fact, Malaysia has been heavily reliant on FDI in its acceleration of economic growth. Shapiro and Marthur have found that the inflow of FDI is shown to have a strong, positive effect on a country's growth, productivity and incomes[11]. With the rise of other countries, particularly China, India and the nations within the ASEAN region, is Malaysia still a good place for investors? Will the trend of attracting foreign investors to Malaysia continue?

WEAK IP RIGHTS PROTECTION INCREASES THE PROBABILITY OF IMITATION, MAKING A COUNTRY LESS ATTRACTIVE OR PROFITABLE FOR FOREIGN INVESTORS.

Two conditions must be met in order for investors to invest abroad. First, the foreign country must offer location advantages that make it more profitable to locate the business in that country, and secondly, it must be more profitable for the commercial entity to internalize production instead of selling or licensing its intellectual assets to local entities in the foreign country[12]. Weak IP rights protection increases the probability of imitation, making a country less attractive for foreign investment.

Maskus came to the conclusion that while there is evidence showing that strengthening IP rights can be effective in inducing additional inflow of FDI, it is only a factor amongst several other important factors[13]. Although a strong IP regime is not the only factor which will increase an inflow of FDI, indications are that stronger IP rights positively affect trade and FDI. In a study conducted by Gold and Gruben it was shown that strengthening IP rights provides a more affirmative path to economic growth as countries liberalize their trade regimes[14].

The study by Shapiro and Mathur[15] on the benefits of respecting IP rights of foreign pharmaceutical producers in India is an interesting study, not least because India is known to offer weak patent protection in relation to pharmaceuticals in the past. This is, however, rapidly changing in light of India's accession to the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS).

In that paper, the authors first examined the FDI in total and in relation to pharmaceutical sector in India from 1991 to 2013, and found that from the year 1995 to 2005, India saw a four-fold increase in the annual average FDI compared to the period from 1991 to 1995[16]. The increase in annual average FDI for the drugs and pharmaceuticals is even more drastic, with an increase of $1,203 million during the period 2005 to 2013 compared to the period from 1991 to 1995. This is significant because India adopted the TRIPS requirements in 2005 with that year being the end of the transition period for adopting the requirements.

What is even more notable about this study is that the authors showed that if India had adopted an IP regime comparable to China, the annual FDI in pharmaceuticals in India would increase by an estimated 33 per cent, and if India had adopted IP rights similar to the United States, FDI flows should see an estimated increase by 83 per cent annually[17]. In a nutshell, the study on the Indian pharmaceutical and drug sector shows that with stronger IP rights, the inflow of FDI into India for the sector had increased and provides the basis for the assertion that further overnment has recognized the importance of FDI in Malaysia's economic growth and in fact, Malaysia has been heavily reliant on FDI in its acceleration of economic growth. Shapiro and Marthur have found that the inflow of FDI

In comparison to India (3.76 out of a possible 5), Malaysia scored lower (3.48 out of a possible 5) in terms of the strength of patent rights[18]. Therefore it is submitted that with improvement to Malaysia's IP and patent regime, there should be a corresponding increase in FDI inflow into the country including in the pharmaceutical sector.

There is increasing evidence to show that IP rights have a positive impact on FDI decisions. Whilst the relationship between a strong IP regime and FDI decisions may not be straightforward given that there are other factors involved, the basic premise is that countries with stronger IP regimes will be in a better position to attract knowledge-related FDI[19].

FDI WILL PROVIDE HIGHER BENEFITS TO MALAYSIA IF THE INVESTORS APPLY ADVANCED TECHNOLOGIES AS OPPOSED TO LESS TECHNOLOGICALLY INTENSIVE APPLICATIONS.

In line with the 10th Malaysia Plan to turn Malaysia into a high income nation, policy makers should also pay particular attention to the quality of the FDI inflow which the country is attracting. FDI will provide higher benefits to Malaysia if the investors apply advanced technologies as opposed to less technologically intensive applications[20]. By strengthening IP protection, more benefits can be derived from FDI. R&D expenditure, the value added and exports created also tend to rise with IP protection[21]. In high technology sectors which rely heavily on IP rights for protection, foreign investors tend to be deterred by a weak IP regime[22]. Additionally, a weak IP regime will also tilt the focus of FDI projects from manufacturing to distribution[23].

THE BASIC PREMISE IS THAT COUNTRIES WITH STRONGER IP REGIMES WILL BE IN A BETTER POSITION TO ATTRACT KNOWLEDGE-RELATED FDI.

Survey evidence from China reported that foreign companies are reluctant to locate R&D facilities in China for fear of misappropriation, patent infringement, enforcement problems and weak penalties; as a result, technologies transferred to China are not the latest, but technologies that were at least five years behind global standards[24]. As new technology, knowledge and ideas are crucial for a developing country like Malaysia, it is important not to slip into such a predicament.

[11] Robert J. Shapiro and Aparna Mathur "How India Can Attract More Foreign Direct Investment, Create Jobs, and Increase GDP: The Benefits of Respecting the Intellectual Property Rights of Foreign Pharmaceutical Producers" (Sonecon LLC, 2014) page 2 *<http://www.sonecon.com/docs/studies/FDI_IP_and_the_Pharmaceutical_Sector_in_India-Shapiro-Mathur-Final-January2014.pdf >* Assessed on 19 September 2014

[12] John H Dunning, "Explaining Changing Patterns of International Productions: In Defense of Eclectic Theory," 41 Oxford Bull. Econ & Stat. (1979) 269 and John H Dunning, "Explaining the International Direct Investment Position of Countries: Towards a Dynamic or Development Approach" (1981) 117 Rev. World Econ. 30 cited in Carlos A. Primo Braga and Carsten Fink "The Relationship Between Intellectual Property Rights and Foreign Direct Investment" (1998) 9 Duke J. Comp & Int'l L 163 at page 170

[13] Keith E. Maskus, "The Role of Intellectual Property Rights in Encouraging Foreign Direct Investment and Technology Transfer" (1998) 9 Duke J. Comp & Int'l L 109 at page 152

[14] David M. Gould & William C. Gruben, "The Role of Intellectual Property Rights in Economic Growth" (1996) 28 J.Dev.Econ. 323, at pages 338 -46 cited in Keith E. Maskus, "The Role of Intellectual Property Rights in Encouraging Foreign Direct Investment and Technology Transfer" (1998) 9 Duke J. Comp & Int'l L 109 at page 145

[15] Supra Note 11

[16] Supra Note 11 at page 17

[17] Supra Note 11 at page 19 and 20

[18] Walter G. Park "International Patent Protection - 1960 -2005" Research Policy 37 (2008) 761 at pages 762-763. However, do note that this Index was calculated in the year 2005 (we were unable to locate an updated index)

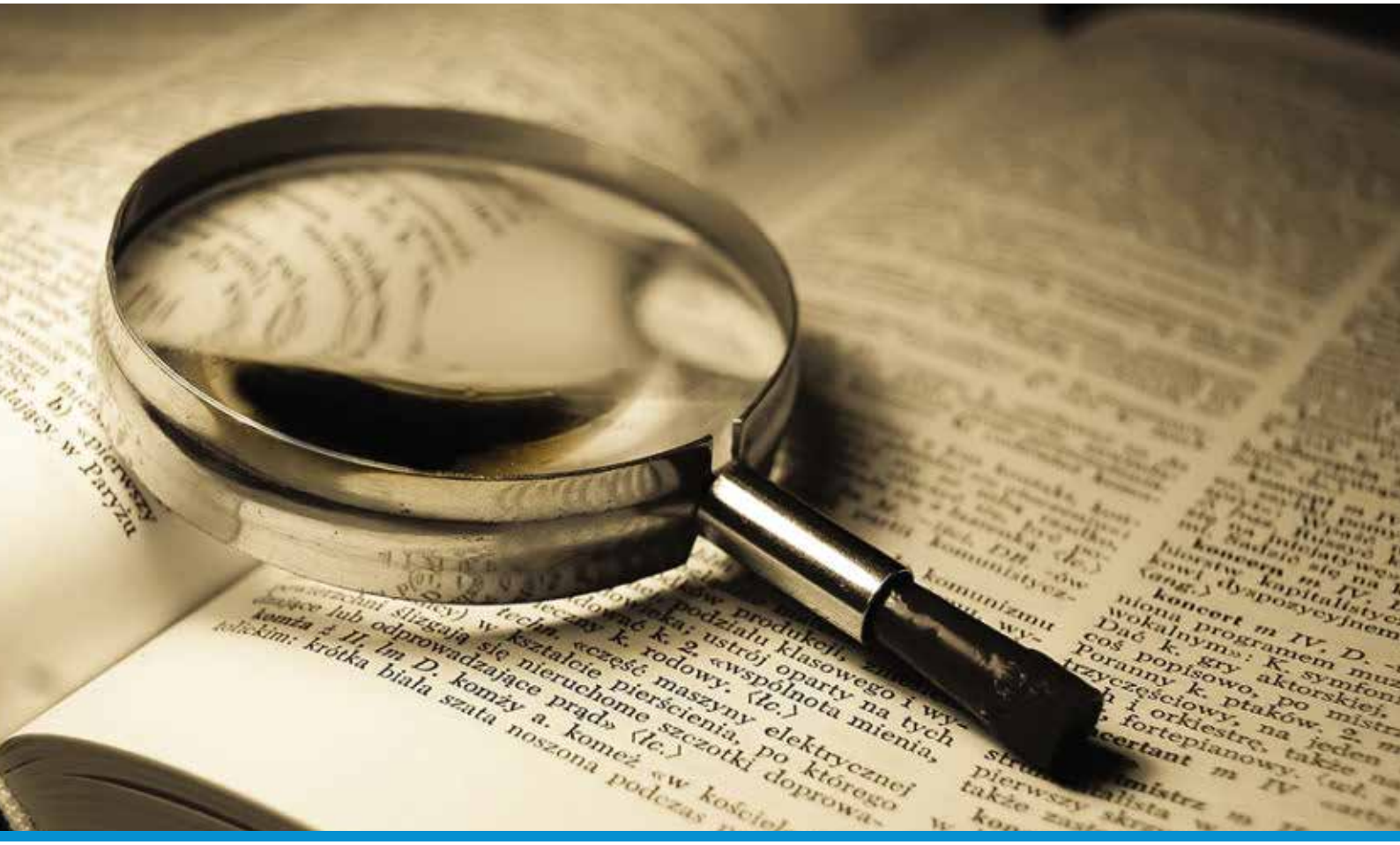
[19] Carlos A. Primo Braga and Carsten Fink "The Relationship Between Intellectual Property Rights and Foreign Direct Investment" (1998) 9 Duke J. Comp & Int'L 163 at 181

[20] Peter Nunnenkamp and Julius Spatz "Intellectual Property Rights and Foreign Direct Investment: The Role of Industry and Host-Country Characteristics" (Kiel Working Paper No. 1167, 2003) *< http://papers.ssrn.com/sol3/papers.cfm?abstract_id=425240 >*

[21] Supra Note 20 at pages 38 and 39

[22] Beata K. Smarzynska "The Composition of Foreign Direct Investment and Protection of Intellectual Property Rights: Evidence from Transition Economies" (Policy Research Working Paper 2786, 2002) page 1 and 14 *<http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2002/03/08/000094946_02022604025132/Rendered/PDF/multi0page.pdf >* accessed 19 September 2014

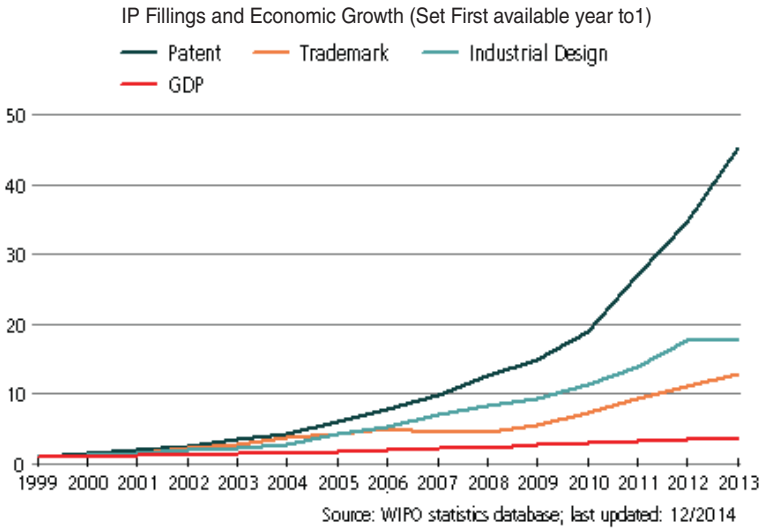
[23] Supra Note 22 at pages 12 and 14



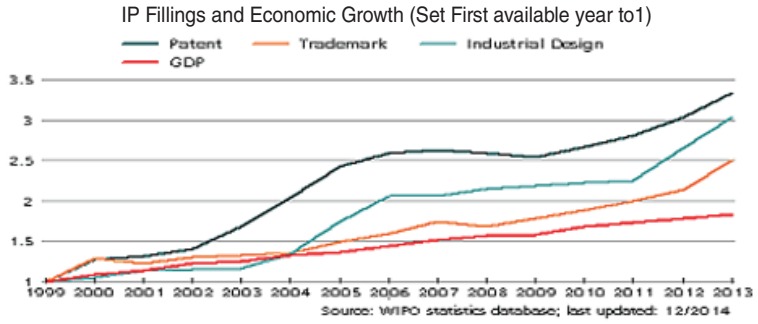
2.4 Rise of East Asia, GDP and Strength of IP Protection

Of late, there has been much discussion on the sharp acceleration of growth in countries in East Asia, including China (Mainland China, Hong Kong and Taiwan), Japan, Korea and Singapore. The rise of East Asia began with Japan, who, soon after World War II, rebuilt its infrastructure with the latest technology from abroad, transforming the country into the world's fastest growing economy between 1950s to the 1970s[25]. Japan is now considered a lead economy with Hong Kong, Taiwan and South Korea taking over many industries in which Japan specialized in in the 1960s.[26]

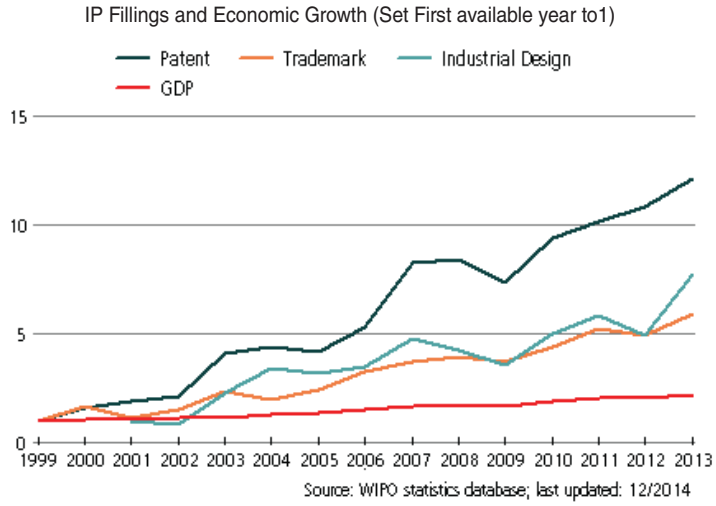
The graphs below show the IP filings and the gross domestic product (GDP) of China, South Korea, Singapore and Japan from 1998 to 2013, taken from the World Intellectual Property Organisation (WIPO) statistics database. While the IP filings in Japan seem to be a bit more erratic and uncertain, going up in one year and moving down in other years, South Korea and Singapore have seen a sharp rise in IP filings. China's increase in IP filings is even more rapid for the same period.



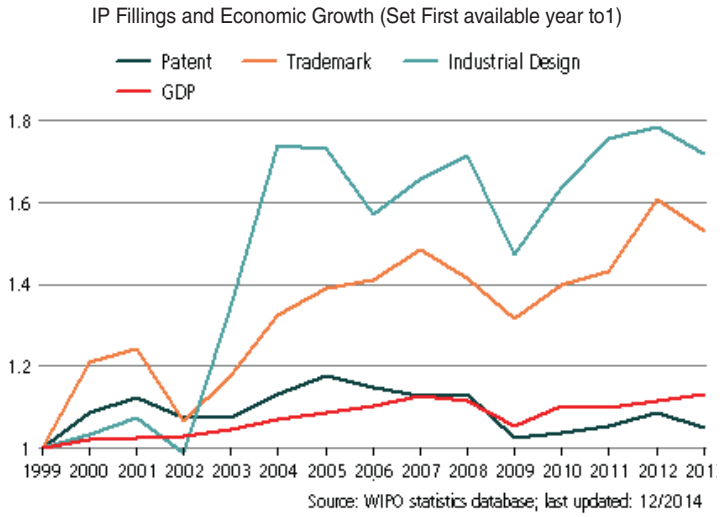
Graph 1: IP Fillings and Economic Growth in China[27]



Graph 2: IP Fillings and Economic Growth in Korea[28]



Graph 3: IP Fillings and Economic Growth in Singapore[29]



Graph 4: IP Fillings and Economic Growth in Japan[30]

Country	1960-1990	2005
South Korea	2.55	4.33
Singapore	1.64	4.21
China	1.33	4.08

Table 1 Ginarte-Parl Index for the Years from 1960 to 1990 and 2005 for South Korea, Singapore and China

Table 1 above shows the Ginarte-Park Index[31] for the years from 1960 to 1990 and 2005. The Ginarte-Park Index is used to indicate the strength of patent rights in a country and is the unweighted sum of the following five scores[32]:

(a) coverage (inventions that are patentable)

(b) membership in international treaties

(c) duration of protection

(d) enforcement mechanisms

(e) restrictions

As can be deduced from the index, all three countries, South Korea, Singapore and China, have seen a significant improvement in the strength of patent rights. Hence, there is reasonably a basis for saying that stronger IP rights have somewhat contributed to an increase in IP filings. For example, Hu and Jefferson came to the conclusion that the more patent-friendly environment was one of the factors which contributed to the surge in patenting in China[33].

Corresponding with the increase in IP filings in South Korea, Singapore and China, there is also an increase in GDP. Although it cannot be concluded that the increase in GDP is due mainly to the strengthening of IP rights or the increase in IP filings in the respective countries, Agenor et al has identified the ability to move from imitating and importing foreign technology to innovating local technology as one key factor to the success of East Asian economies[34]. As a result of the well-functioning, robust IP systems in place, these countries were able to protect their proprietary technologies and innovation through a strong patent system. East Asian countries have been very productive in generating innovation. Gill and Kharas have found that the patenting activity in Taiwan, after taking into account the size of the population, is comparable to that of Japan and the United States, whilst Hong Kong, South Korea and Singapore are catching up[35].

24 Keith E Maskus, Sean M Dougherty and A. Mertha in "Intellectual Property Rights and Economic Development in China," in Carsten Fink and Keith E Maskus (eds)"Intellectual Property and Development – Lessons from Recent Economic Research" (Oxford University Press/World Bank, 2005) page 314

25 Diego Valderrama "Can International Patent Protection Help a Developing Country Grow?" (FRBSF Economic Letter Number 2004-11, 14 May 2004)

26 Indermit Gill and Homi Kharas "An East Asian Renaissance: Ideas for Economic Growth" (World Bank, 2007) page 16

27 World Intellectual Property Organisation "Statistical Country Profiles: China" *<http://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=CN >* accessed 26 January 2015

28 World Intellectual Property Organisation "Statistical Country Profiles: Republic of Korea" *<http://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=KR >* accessed 26 January 2015

29 World Intellectual Property Organisation "Statistical Country Profiles: Singapore" *< http://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=SG >* accessed 26 January 2015

30 World Intellectual Property Organisation "Statistical Country Profiles: Japan" *< http://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=JP >* accessed 26 January 2015

31 Supra Note 18

32 Supra Note 18 at page 761

33 Albert Guangzhou Hu and Gary H Jefferson "A Great Wall of Patents: What is behind China's recent patent explosion?" (2009) 90 Journal of Development Economics 57 at page 61

34 Agenor, Canuto and Jelenic "Avoiding Middle Income Growth Traps" (Economic Premise No. 98, World Bank, 2012)

35 Supra Note 25 at pages 154 -155

2.5 Innovation

2.5.1 Technology Creation and Technology Transfer

As set out in Part 1 of this Position Paper, the general idea behind IP at the beginning of its history is to provide a reward system for innovators and creators, thus encouraging innovation. Technological advancement lies at the heart of economic growth, thus R & D and innovation have been given priority by policy makers. The relationship between IP rights and innovation may be examined through the impact of IP rights on technology creation (domestic innovation) and technology transfer (foreign innovation)[36].

In the 1970s, the general consensus amongst policy makers in relation to IP rights is that IP rights will only benefit patentees from developed countries as less developed countries do not have the ability to create IP[37] . In the same vein, there is also an assumption that stronger IP protection will be detrimental to local firms as it will reduce the ability of local firms to imitate foreign technology. The inherent problem with this view is that it not only underestimates the ability of locals to innovate, but it also does not take into account the technology transfer or diffusion that occurs when foreign multinationals, bringing with it intellectual capital, enter the country.

Technology diffusion may be encouraged by IP protection[38]. Maskus identified 5 main channels of technology transfer through market mediated mediums[39]:

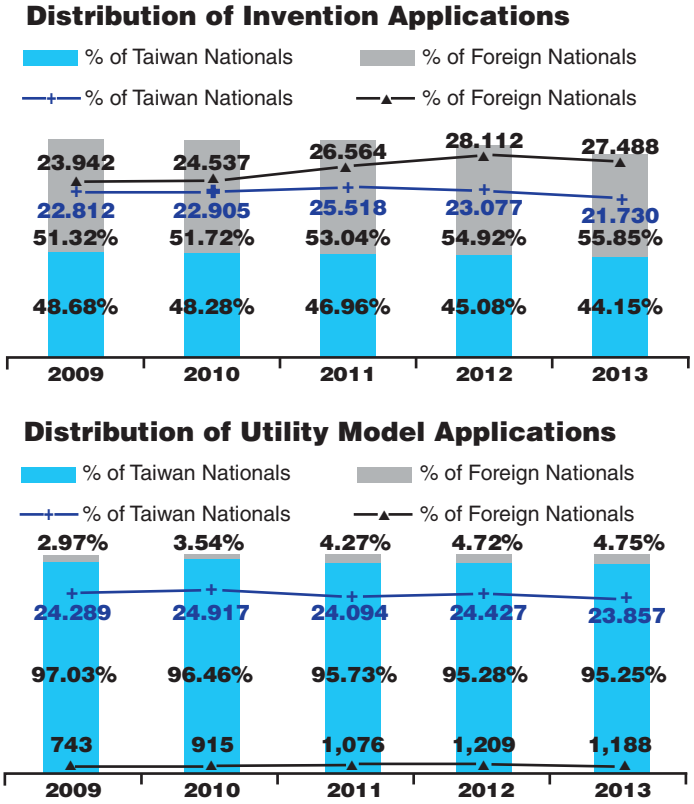
1. Trade in goods and services
2. FDI
3. Joint venture
4. Cross-border movement of personnel
5. Licensing

The correlation between FDI and a strong IP regime has already been discussed earlier. Other than FDI, foreign technology may also be transferred through technology licensing. Stronger IP rights will increase the propensity of foreign firms to license as the risk of imitation by a third party or defection by a licensee will decrease with stronger IP rights[40]. Empirical analysis by Park and Lippoldt concluded that there is general support for the proposition that the strengthening of IP rights has had a net positive effect on international licensing between unaffiliated parties during the 1990s[41]. Better protection also implies that licensing and royalty contacts will be better enforced[42] and licensing has an advantage in technology transfer as it also benefits domestic firms. It enables access and the exploitation of technology and know-how[43], which might be more difficult to achieve with the other methods of technology diffusion.

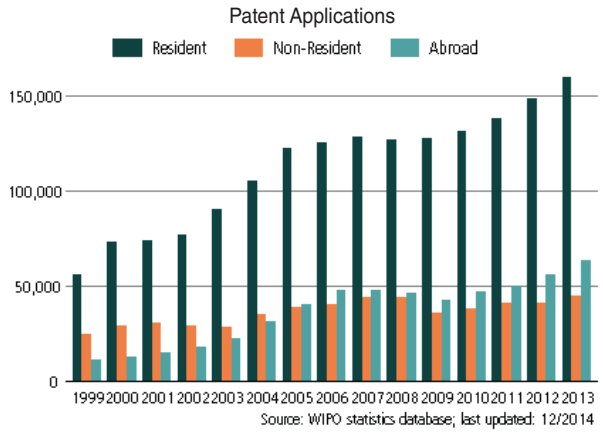
EMPIRICAL ANALYSIS BY PARK AND LIPPOLDT HAS CONCLUDED THAT THERE IS GENERAL SUPPORT FOR THE PROPOSITION THAT STRENGTHENING OF IP RIGHTS HAS HAD A NET POSITIVE EFFECT ON INTERNATIONAL LICENSING BETWEEN UNAFFILIATED PARTIES DURING THE 1990S.

2.5.2 Evolution From Reliance On Foreign Technology To Homegrown Innovation

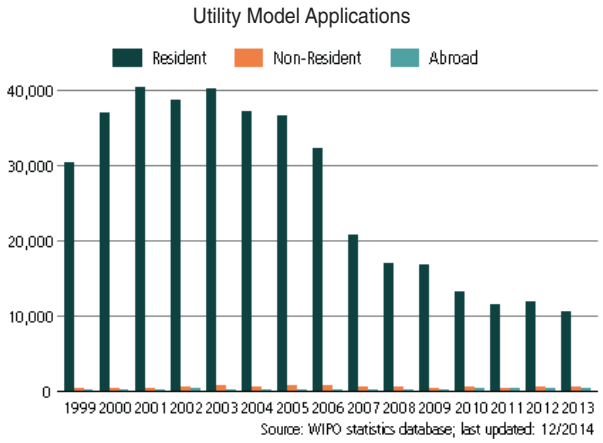
Although the governments of Singapore and China have been very welcoming of FDI, this has not been the case in the transformation of Japan, South Korea and Taiwan (China) from middle-income, developing economies to high-income, developed economies[44]. The three countries have been relatively restrictive in allowing the inflow of FDI. In South Korea and Taiwan, there has been a focus on licensing and the development of local technological capabilities[45]. Such an approach to encourage innovation has seen results for both countries. The charts below showing the patent and utility model applications filed in Taiwan, South Korea and Malaysia by nationals as opposed to foreign applicants present a stark contrast. More than 40% of patent and utility model applications in South Korea and Taiwan are applied for by their own nationals, whilst in Malaysia applications by foreigners far outnumber the applications by locals.



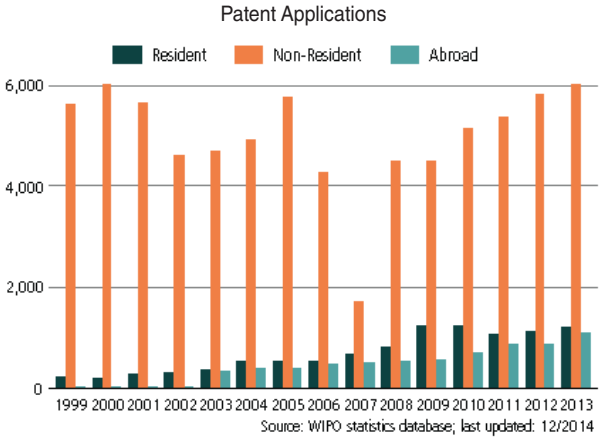
Graph 5: Distribution of Inventions and Utility Model Applications in Taiwan [46]



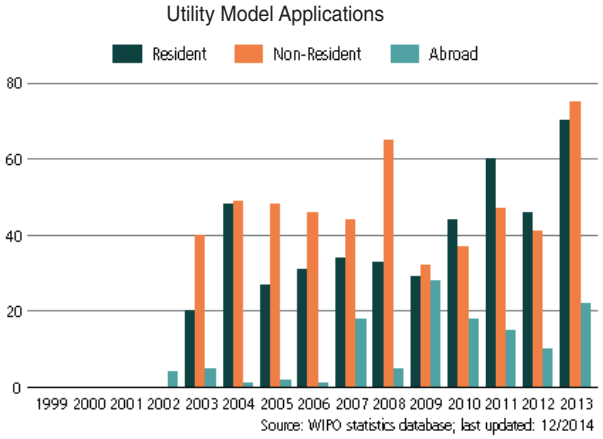
Graph 6: Patent Applications according to filing applications by residents, non-residents and applications filed by the country's resident aboard in South Korea.[47]



Graph 7: Utility Model Applications according to filing applications by residents, non-residents and applications filed by the country's resident aboard in South Korea.[48]



Graph 8: Patent Applications according to filing applications by residents, non-residents and applications filed by the country's resident aboard in Malaysia .[49]



Graph 9: Utility Model Applications according to filing applications by residents, non-residents and applications filed by the country's resident aboard in Malaysia.[50]

South Korea and Taiwan have moved from being imitators of foreign technology to innovators in their own right[51]. Technology diffusion, particularly from Japan and the United States contributed to the success of South Korea and Taiwan[52] – initially importing foreign innovation, both counties are now patenting their own technology, as seen in the graphs above.

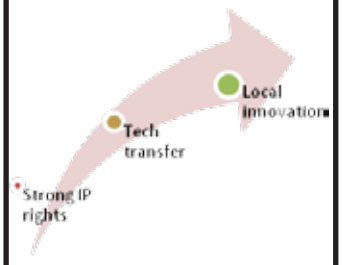


Figure 2 Some East Asian countries have been able to create technology locally by virtue of precursor technologies that has been transferred into the country.

Taiwan's High Tech Computer Corporation (HTC) is an example of how a company can first start by imitating and then moving on to innovation. The company first started off as an original equipment manufacturer (OEM), and later moved on to manufacturing and selling smartphones under its own name[53]. HTC is just one of the many technology companies which emerged from Taiwan in the same manner - Wistron Corporation, Taiwan Semiconductor Manufacturing Corportion (TSMC), Hon Hai Precision (Foxconn), just to name a few, have also made their mark globally.

The existence of a strong IP regime effectively creates a valuable asset, which provides a form of leverage or capital for local innovators to continue to grow and innovate. A startup company with a patent for a marketable invention can, for example, license or assign the patent to a third party, generating the capital required for it to expand as a company, improve on that invention and continue to innovate.

2.5.3 Stronger IP Regime and Increase in R&D

Stronger IP rights will spur innovation – even if not immediately. As illustrated above, the inflow of FDI to India has increased pursuant to the implementation of TRIPS. In addition to an increased inflow of FDI, a study by Arora et al[54] on the impact of the policy shift shows that there is an increase in R&D investment and measured inventive input that seems to coincide with patent reform. They have also found that private returns to R&D investment appear to be rising because of the reform. Kanwar and Evenson[55] concluded in their research by establishing an empirical relation between the protection of IP rights and technological change that IP protection has a strong positive association with R&D investment.

IN DEVELOPING COUNTRIES, A LARGE PART OF THE LACK OF INNOVATION IS DUE TO THE UNWILLINGNESS TO INNOVATE, BECAUSE THE RETURN OF INNOVATION IS LOW.

Malaysia is still lagging behind in terms of R&D spend in the country. Despite all the negative perception of China's IP regime, Orcutt and Shen found that China has made some progress in relation to its patent enforcement system[56], and China has overtaken Malaysia in terms of R&D spend. Malaysia's gross domestic expenditure on R&D in 2011 was 1.07%[57] compared to China's 1.84%[58] in the same year.

In developing countries, a large part of the lack of innovation is due to the unwillingness to innovate, because the return of innovation is low[59]. This may be due to lower institutional quality in protecting the proprietary rights of inventors, notably the IP and general property rights protection of the country[60]. In a nation where IP rights are not well protected, profitable new products or services are easily copied, therefore the return to the innovator is reduced; conversely, innovators can obtain good return if their proprietary rights are protected[61]. As Chen and Puttitanun succinctly state in relation to developing countries:

> "While lower IPRs facilitate imitations of foreign technologies, which reduces the market power of foreign firms and benefits domestic customers, a developing country may also need to increase IPRs in order to encourage innovations by domestic firms. We show that innovation in a developing country increases with the protection of IPRs, and it is possible that a country's optimal IPRs depend on its development (technological ability) in a non-monotonic way, first decreasing and then increasing…..The empirical evidence confirms both the positive impact of IPRs on innovations in developing countries….."[62]

36 Emmanuel Hassan, Ohid Yaqub and Stephanie Diepeveen "Intellectual Property and Developing Countries" (RAND Europe prepared for the UK Intellectual Property Office and the UK Department for International Development Cambridge, 2009) page 16

37 Primo Braga C.A. "The Developing Country Case For and Against Intellectual Property Protection" in WE Siebeck, (ed) "Strengthening Protection for Intellectual Property in Developing Countries: A Survey of Literature". (World Bank Discussion Paper No.112, pp 69-87, World Bank, 1990) cited in Carlos A. Primo Braga et al" Intellectual Property Rights and Economic Development" (World Bank Discussion Paper No. 412 World Bank, 2000) page 7 *<http://www-wds.worldbank.org/servlet/WDSContentServer/WDSP/IB/2000/05/13/000094946_00050206013672/Rendered/PDF/multi_page.pdf >* accessed 20 September 2014

38 Supra Note 25

39 Keith Maskus, "Encouraging International Technology Transfer" (Issue Paper No. 7, UNCTAD-ICTSD Project on IPRs and substantive development, 2004) cited in Walter G. Park and Douglas Lippoldt "International Licensing and the Strengthening of Intellectual Property Rights in Developing Countries during the 1990s" (OECD Trade Committee, OECD Economic Studies No. 40, 2005/1, 2005) page 11

40 Guifang Yang and Keith E Markus (2001) "Intellectual Property Rights and Licensing: An Ecometric Investigation" in Carsten Fink and Keith E Markus (eds) "Intellectual Property and Development Lessons from Recent Economics" (Research World Bank/Oxford University Press, 2005) pages 113 -114

41 Walter G. Park and Douglas Lippoldt "International Licensing and the Strengthening of Intellectual Property Rights in Developing Countries during the 1990s" (OECD Trade Committee, OECD Economic Studies No. 40, 2005/1, 2005) page 37

42 Supra Note 41 at page 13

43 Supra Note 41 at page 38

44 Supra Note 25 at page 140

45 Supra Note 25 at page 133

46 Intellectual Property Office, Ministry of Economic Affairs "TIPO Annual Report 2013" (2014)

47 Supra Note 28

48 Supra Note 28

49 World Intellectual Property Organisation "Statistical Country Profiles: Malaysia" *< http://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=MY >* accessed 26 January 2015

50 ibid

51 Albert Guangzhou Hu and Adam B. Jaffe "Patent Citations and International knowledge flow: the case of Korea and Taiwan" (2003) Int. J. Ind. Organ 849 at page 419

52 ibid

53 Antoine van Agtmael "The Emerging Markets Century: Now a New Breed of World-Class Countries is Overtaking the World"(Simon & Schuster, 2007) pages 132 to 139

54 Ashish Arora, Lee Branstetter and Chirantan Chatterjee "Strong Medicine: Patent Reform and the Emergence of a Research Driven Pharmaceutical Industry in India" (Conference Draft for NBER Conference on Location of Biopharmaceutical Activity, 2008) *< http://www.researchgate.net/ >* accessed 21 September 2014

55 Sunil Kanwar and Robert E. Evenson "Does Intellectual Property Spur Technological Change?" (2003) Oxford Economic Papers 55 at page 258 <http://infojustice.org/download/gcongress/incentives,remunerationandcollectivemanagement/Kanwar%20article.pdf > assessed 22 September 2014

56 John L. Orcutt and Hong Shen "Shaping China's Innovation Future: University Technology Transfer in Transition" (Edward Edgar Publishing, 2010)

57 UNESCO Institute for Statistics "Country Profiles: Malaysia" *< http://www.uis.unesco.org/DataCentre/Pages/country-profile.aspx?regioncode=40515&code=MYS >* accessed on 20 September 2014

58 UNESCO Institute for Statistics "Country Profiles: China" *< http://www.uis.unesco.org/DataCentre/Pages/country-profile.aspx?code=CHN&regioncode=40515 >* accessed on 20 September 2014

59 Ha Nyuyen and Patricio A Jaramillo, "Institutions and Firms' Return to Innovation: Evidence from the World Bank Enterprise Survey," (Policy Research Working Paper 6918, World Bank, 2014) *<http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2014/06/11/000158349_20140611115622/Rendered/PDF/WPS6918.pdf >* accessed 17 September 2014

60 Supra Note 59 at page 15

61 Supra Note 59 at page 16

62 Yongmin Chen and Thitima Puttitanun "Intellectual Property Rights and Innovation in Developing Countries" (2005) 78 Journal of Development Economics 474 at pages 489 to 490


Sign here:

2.6 Conclusion

The Malaysian Government has achieved success in developing Malaysia's infrastructure[63] - Malaysia ranked 18th in World Bank's Doing Business ranking in 2015[64]. Malaysia is also not lacking in companies that are capable of innovation. For instance, the Malaysian Biotechnology Corportion Sdn Bhd or Biotech Corp, an agency under the purview of the Ministry of Science, Technology and Innovation (MOSTI) acts to identify value propositions in both R&D and commerce and to support these ventures via financial assistance and development services[65].

Quite a few Bionexus status companies, companies that receive financial support and other forms of assistance from Biotech Corp, have shown some potential. Nova Laboratories Sdn Bhd (Novalab), a leading company in herbal R&D in Malaysia, is the patent holder of a liver tonic k nown as HEPAR-P. From 2007-2010, the company sold 20 million of the capsules[66]. A novel, faster and more efficient method to develop the fabrication of hydroxyapatite, a synthetic material that is used as a bone graft substitute developed by Advance Materials Research Centre (AMREC) – Sirim, is currently pending grant of patent. The product is currently being commercialized by another Bionexus company, Granulab (M) Sdn Bhd[67].

In a nutshell, Malaysia is well-positioned to make the progress from an upper-middle income economy to a high income economy with the right policy and implementation in place, which must include strengthening its IP rights regime including those relating to pharmaceuticals.

The strengthening of IP rights in Malaysia will increase FDI and also spur innovation. It will not only encourage foreign technology transfer into the country but it will also encourage domestic firms to innovate. All in all, as put forward above, strong IP rights is crucial for a developing country like Malaysia that is striving to achieve high income nation status.

63 see generally, Naidu, G "Infrastructure Development in Malaysia", in Kumar, N. (ed.),"International Infrastructure Development in East Asia – Towards Balanced Regional Development and Integration," (2008) (ERIA Research Project Report 2007-2, Chiba:IDE-JETRO, 2008) pages 204-227. < *http://www.eria.org/RPR-2007-2.pdf* > accessed 22 January 2015

64 World Bank Group "Ease of Doing Business in Malaysia" < http://www.doingbusiness.org/data/exploreeconomies/malaysia > accessed 26 January 2015

65 Malaysian Biotechnology Corporation "An Agency to Feed, Heal and Fuel the World"< *http://www.biotechcorp.com.my/company/#* > accessed 21 September 2014

66 Nova "What makes us different" <*http://nova.com.my/*> accessed 21 September 2014

67 Granulab (M) Sdn Bhd "About Us" http://www.granulab.com/index.php?option=com_content&view=article&id=45&Itemid=27 accessed 21 September 2014

Innovating for a Healthier, Economically Vibrant Nation

OUR VISION

An organisation working together with key stakeholders for better health and quality of life.

OUR MISSION

Is to provide access to innovation medicines for better health and improved quality of life for all in Malaysia by:

- Promoting timely access to quality and innovative medicine
- Encouraging research and development of pharmaceutical products in Malaysia
- Forming strategic health partnership with key skateholders for the advancement of public health
- Empowering consumers for safe and responsible self-medication
- Promoting industry values and contributing to the nation
- Upgrading the skills and knowledge of industry's human resources
- Ensuring the ethical promotion of medicines in compliance with local law and a set of marketing practices

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