INCENTIVES IN PROMOTING BIOTECHNOLOGY

By

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₪ "Science and the application of science are linked as the fruit is to the tree."

- Louis Pasteur (1822-1895), father of microbiology. ₪

BIOTECHNOLOGY

There are such varied and divergent definitions of biotechnology that, naively, we really wonder if there is any possible relationship between all these different definitions. The confusion arises because biotechnology covers a broad segment of science, and its industrial and societal applications.[1] In layman terms, biotechnology is the application of science and engineering to the use of living organisms, or substances derived from them, to generate *products* or to perform *functions* that can benefit the human condition. The *products* include substances that can help diagnose, prevent, or cure diseases of humans and animals; to enhance the productivity of or eliminate pests that affect crops; or to replace chemicals or other materials that consume nonrenewable resources or create environmental hazards.[2] The *functions* include the purification of water and air, environmental remediation, and the generation of energy or industrial chemicals with minimal environmental impact.[3]

Since the 1980s, biotechnology has commanded worldwide attention because of its perceived potential impact on the quality of life. The biotech industry has been so successful in translating basic research in the life sciences into very high-value added products. Particular emphasis has been on bio-pharmaceuticals for the treatment of diseases.[4] A second generation of bio-products – intermediate-value pharmaceutical products (therapeutic proteins, polysaccharides, vaccines and diagnostics), specialty products (antibiotics, functional foods and value-added agricultural products), specialty chemicals (fuels, bio-pesticides, chemicals) and materials (fibers, nano-size materials)[5,6] derived from renewable resources – is now being developed whose price-cost difference will be much lower. When the difference between price and cost shrinks, and profitability becomes an important function of production cost, bioprocess engineering becomes a critical component in the economic development of new products. Bioprocess engineering is a sub-discipline within biotechnology that is responsible for translating the discoveries of the life sciences into practical products, processes, or systems that serve the needs of society.

The justification for commercialization of the fruits of any scientific endeavor is the potential for providing marketable goods and services, and thereby generating gainful employment and return on investment. Basic discoveries in the life sciences during the 1980s have created a family of novel pharmaceutical products with new therapeutic and prophylactic potential. The worldwide annual sales

grew from zero in 1980 to $4 billion in 1990, and in the waning decade of the twentieth century, the worldwide annual sales grew another tenfold.

Financial reward aside, biotechnology has also become more information-laden and knowledge-based. One thread that runs through all researches in biotechnology is the importance of information and knowledge, and the ability to access, compare and identify new knowledge is an integral part of the research process. This is embodied in a relatively new field called bioinformatics – the study of information content and information flow in biological processes – which is rather mature in advanced nations, but has become very popular in developing nations.[4]

Another aspect is that biotechnology has also become more indigenous – products derived from native flora, plants, microorganisms, fauna and animals. Nearly three quarters of all the plant-based prescription drugs in use today were derived from drugs used in indigenous medicine. In other words, more than a quarter of all the prescriptions from pharmacies come from chemicals originally discovered in plants (for example, the Chinese spice, star anise, provides the starting material for the manufacture of the anti-influenza drug Tamiflu, which is expected to be the first line of defense in an avian flu pandemic), 13% come from microorganisms, and 3% come from animals. Yet these materials are only a minuscule fraction of the ones that are almost certainly available. Up to now, scientists have named 1.6 million species, but this is far, far short of the total. Scientists estimate that there are between 10 million and 100 million species on the Earth today.

It is thus not surprising that nations, particularly those with lower labor costs and real estate property values, and reasonable legal framework, and those endowed with nature's gift – biodiversity – are currently entering the field. To be able to compete with more advanced nations, newcomers in the biotech industry have to offer comparable, if not much more, attractive incentives.

ENTER A TIGER

Malaysia is a recent entrant into this exciting industry. The BioValley Initiative was officially launched in October 2002; in April 2005, under a new administration, the National Biotechnology Policy tax incentives (NBPti) were made public. Also announced are the equivalents of bio-clusters, but called bio-nexuses.

Malaysia's rich bio-resources are barely tapped for healthcare products. There is much Malaysia can share with the world for the betterment of humankind. Not surprisingly, Malaysia is focusing on sustainable utilization for her mega bio-resources.[7] Nonetheless, being a newcomer in the biotech industry, the NBPti are very *aggressive*, and yet very *progressive*.

Aggressive And Yet Progressive Incentives

Relatively, the NBPti are very *aggressive* because if we compare them with similar tax incentives in other nations such as the U.S., European countries and Pacific Rim countries, they are very generous:

Singapore, for example, offers a number of tax incentives very similar to the NBPti, such as "pioneer status" that gives foreign manufacturers of new products tax exemptions for up to 10 years; but unlike the NBPti, it offers low tax rates for exports out of Singapore as it has free trade agreement with some foreign markets. In New Zealand, research and development (R&D) is 100 percent tax deductible. The government of China can offer tax incentives to certain foreign-funded companies, as and when appropriate, and in line with the requirements of the country's macroeconomic development. In Taiwan, companies may deduct 35-50% of the amount of their investment in R&D or personnel training from their income tax over a five-year period. In India, companies enjoy tax exemption on income from sales of intellectual property, or royalty, or milestone payments, and a minimum duty of 5% on import of equipment for R&D. In the U.K., biopharma companies get no specific tax benefits beyond the standard corporate R&D tax credits. In France, companies are eligible to receive tax credits on a combination of their total R&D investment and the year-to-year investment increase. Sweden does not offer any R&D tax incentives, but the country has the lowest corporate tax rate in Europe. In the U.S., a company may be eligible for a reduction of its state franchise or corporate income tax; a corporate tax rate reduction over five years; an investment credit; a jobs tax credit based on the number of new employees.

Like other nations vying for biotech companies, tax incentives are only a part of an integral incentive package – there are usually grants, lower property lease, property tax reduction, supporting infrastructure, research institutions… But unlike more advanced nations, Malaysia, being a developing nation, has to offer a more aggressive incentive package to have an equal or better chance of attracting the biotech industry.

Numerical differences between the NBPti and tax incentives of other nations aside, an interesting observation is Item 3 in the NBPti, which states "Dividends distributed from tax exempt Biotechnology companies will be treated as tax exempt income for its shareholders." In most developed nations, there is a rather unpopular so-called "double taxation" policy – that is, corporate profits are taxable, so are dividends. Even if corporate taxes are reduced as incentives to entice investments (in biotech companies, for example), dividends are always treated as taxable incomes of recipients.

In certain sense, Item 3 could have been introduced to encourage investments from overseas, which without another bi-national agreement, dividends may be taxable in the home country. Otherwise, the main purpose of encouraging investments is already embodied in Item 2a & 2b, that is to say, dividends are encouraged to be reinvested to enjoy tax exemption status.

The NBPti are very *progressive* because they take into account the unique nature of biotechnology – companies can operate at a loss for about a decade, investing hundreds of millions of dollars as they take a drug through the discovery process and then regulatory approvals. It is thus clear that with such incentives, Malaysia is positioning itself to attract multinational corporations (MNC) to have presence in Malaysia to do long-term R&D. Looking further ahead, it is also clear that the NBPti will continue to encourage a situation for Malaysia not only to contribute to R&D, but also to have a climate that allows commercialization of products after the R&D phase.

WHY PROVIDE INCENTIVES

One could argue that there is potentially going to be revenue lost by giving biotech companies tax incentives, among other perks. But emerging nations, including Malaysia, will definitely lose revenue, not to mention long-term repercussions, if biotech companies start or expand their R&D or manufacturing efforts in other regions or nations.

The Malaysian government wants to push biotechnology, which is seen as the country's new growth area, to boost the economy and create highly skilled jobs. The sector is expected to contribute 5% to the gross national product by 2020. Malaysia's principal interest, like other nations bidding for biotech companies, is to assist this new and expanding industry while seeing that Malaysians get good jobs at good wages. But unlike more advanced nations, Malaysia is currently behind in biotech. Part of the workforce may have to be re-skilled to tune in with this new growth area. Malaysia also has the interest of attracting technology transfer, attracting returning scholars and experts with the aim to build up skilled and knowledge workers in this industry. This is all in the spirit of nation building.

The Ministry of Science, Technology and Innovation (MOSTI) sees the biotechnology sector to be "knowledge-based" rather than "physical-based." As the MOSTI Minister Datuk Seri Dr. Jamaludin Jarjis said, "We will go where the knowledge is and build on it. A biotechnology plant doesn't need to be confined geographically or by physical infrastructure." Information and knowledge through bioinformatics will be a key component. In fact, with the infrastructure already in place (such as the Multimedia Super Corridor, universities, and research institutes), Malaysia is in a good position to tap into this field, with emphasis in the agricultural, industrial and healthcare sectors.

Lest we forget, we must iterate Malaysia is full of natural resources – biodiversity is nature's gift to Malaysia. Poor cataloging of microorganisms is not only a problem in Malaysia, but is a problem worldwide. Bioprospecting, documenting and cataloging of Malaysian microorganisms and native species are a sure way to protect the intellectual property of Malaysian heritage and natural endowments. Creation of information resource centers or nexuses is a way to translate this endowment into wealth creation.

A Few Caveats

A few challenging, but not insurmountable, caveats remain. We shall list only two: tax holidays and oligopsony.

Incentive packages are normally designed to encourage dividends to be reinvested to enjoy tax exemption status. However, this may not always be the case, and we need to watch out for the so-called legal-borderline "tax holidays." A recent example in the U.S. is a case in point.

Probably due to two "unnecessary wars" that have drained the U.S. coffers and have driven the trade deficit to record height, the Bush administration introduced a new tax break for corporations to allow them to repatriate profits from international havens to the U.S. while paying a fraction of the normal tax rate. This break is couched as part of the American Jobs Creation Act, signed into law by

Bush in October 2004, which allows companies a one-year window to return foreign profits to the U.S. at a 5.25% tax rate, compared with the standard 35% rate.

Any companies (including vice president Dick Cheney's company Halliburton) with profits in other countries can take advantage of the law, but drug makers have been the biggest beneficiaries because they can move profits overseas relatively easily. The money the companies are bringing home has come from many years of using legal loopholes in the tax law to aggressively shelter their profits from the U.S. taxes. According to some experts, drug makers use a variety of complex but legal tactics to move profits from the U.S. to low-tax countries such as Ireland and Singapore where they have large manufacturing operations. The idea is to somehow maximize their profit in low-tax countries and minimize the profit in high-tax countries.

Already, after the announcement of the Jobs Creation Act, four of the six major companies have collectively announced plans to return $58 billion in profits to the U.S.; the other two could repatriate an additional $18 billion (bringing the total to a handsome $76 billion). During the window, returning money to the U.S. is to the advantage of the companies because they can spend the cash in the U.S. rather than having to use it overseas as tax laws and tax incentives generally require.[8]

Oligopsony is a market in which a small number of buyers exert power over a large number of sellers.[9] With each new entrant into the biotech industry – eager to attract the few number of multinational corporations (MNCs), such as drug makers, to have operations in the country – oligopsony will arise at some point. New entrants will compete with each other and with existing biotech nations fiercely to lure away the few MNCs.

This brings us to the fallacy of composition. It is a fallacy because it is a mistaken belief that what seems good for an individual will still be good when others do the same thing. For example, a person standing at a crowded concert may get a better view of the stage, but if everyone at the concert stands up, nobody's view is improved. Similarly, if a new entrant into the biotech industry offers attractive incentives, the entrant will attract a reasonable number of respectable MNCs; if many new entrants are vying for the same MNCs, incentive packages may not do their magic as well.

When oligopsony occurs, the situation resembles an hourglass: at the top are some 100 (assuming this fraction of the world's 192 nations are getting into the biotech business) emerging biotech nations; at the bottom are 2 billion people (assuming this fraction of the world's 5 billion people have access to drugs and other benefits of biotechnology); and at the narrow portion in the middle are some ten or so multinational MNCs earning a profit from every transaction between the top and bottom "globes" of the hourglass.

ROSY OUTLOOK

With so many nations providing different incentives to vie for respectable MNCs, how does Malaysia get noticed amid the clamor? Malaysia has many competitive advantages. Natural resources aside, Malaysia also has relatively cheap real estate and labor cost. Hal once had the great opportunity to talk to a senior executive from a huge pharma in Europe, who happened to be visiting Malaysia.

When asked why the company decided to explore the possibility of establishing operations in Malaysia, the executive responded, without hesitation, "When we think of outsourcing, two countries come to mind immediately: China and India. Malaysia has China and India in one country." Splendid answer. Malaysia is awash with talented Malaysians (Malaysian Malays, Malaysian Chinese and Malaysian Indians and others), most multilingual. Since an A leader can only build an A team with A members, the pool of talents and talented workforce is a bonus.

On July 6, 2005, the Deputy Prime Minister, Dato Seri Najib Razak, announced that the government had endorsed a plan to create a special vehicle – The Malaysian National Nanotechnology Initiatives (INN) to spearhead nanotechnology R&D. INN will be incorporated into the Ninth Malaysian Plan. INN, together with a new Malaysian Nanotechnology Institute (MNI), would focus on introducing nanotechnology in all spheres of economic development.[10] This is a great news for at the interfaces of biotechnology and nanotechnology is nanobiotechnology (or bionanotechnology).[5,6]

Thus Malaysia's Biotech Policy tax incentives and other incentives are a win-win strategy for the nation and for the industry, provided the Malaysian government takes caution of potential caveats, and implements the biotechnology initiative wisely. All endeavors involve risks, but "ships in harbor are safe, but this is not what ships are built for".

ABOUT THE AUTHOR

Hwa A. Lim, aka Hal, scuba diving in the Red Sea, while in Saudi Arabia, which is also promoting the biotech industry.

Dr. Hwa A. Lim, Ph.D. (science), M.A. (science), and MBA (strategy and business laws), B.Sc. (Honours), ARCS, is a Kingstone Best-Seller author, and author of fourteen titles in English. Hal is credited with coining the neologism "Bioinformatics" in 1986/1987, establishing and shaping the field, and initiating the world's very first bioinformatics conference series. These credits earn him the title "The Father of Bioinformatics". He has served as a bioinformatics expert for the United Nations to help set up biotech research parks, as a review panelist for U.S. federal agencies, and as a consultant for prominent firms and biotech companies, organizations, and governments.

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