Chapter 2

Energy Commodity Trading in Singapore

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CHAPTER 2
Energy Commodity Trading in Singapore

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Singapore has transformed its economy into an energy trading hub within a few decades. Such transformation was made possible by a strong government drive, private sector participation, and its natural geographical location as one comparative advantage. Institutional effort was another key driver for the successful transformation. Being an energy trading hub, Singapore is able to help create one price prevail across the markets. As a trading hub, Singapore not only physically connects various markets but also makes the law of one price prevail in the markets thereby promoting energy market integration.

Keywords: energy trading, engine of growth, oil industry, law of one price, energy market integration

JEL Classifications: Q40, Q48

Introduction

From 1961 to 1973, Singapore has successfully built five refineries. After establishing a free trade zone (FTZ) in 1969, Singapore has promoted free trade for petroleum and petroleum products in the FTZ. Singapore is often called as "Houston in Asia" (Doshi, 1989). Although Singapore does not have crude oil reserves, it has managed to be one of the oil hubs in the world following Houston in the United States (US) and Rotterdam in the Netherlands. This success has been attributed to prevailing economic and political conditions in Singapore. The newly independent nation, surrounded by Islam nations such as Indonesia and Malaysia, had a strong demand for energy products mainly from post-war economic drive in Japan and the war in Viet Nam, and its stable political regime provided a safe haven for Chinese investors overseas (Horsnell, 1997). Refinery capacity and oil products show the importance of Singapore in the world oil market. The share of oil-related industries in its economy exhibits the importance of the industry to Singapore's economy.

Singapore's economy can be characterized as a strong interventionist and planned one (Huff, 1994). A growth accounting analysis shows that Singapore has been heavily dependent on energy or oil for the first two decades since its independence in 1965 (MTI, 2001, 2002a and 2002b). After two oil shocks and the recession in 1985, the oil industry in Singapore has shrunk but its contribution to the economy has been stable at around 1percent of value-added.

As a strategy of reviving the oil or energy industry in Singapore, the Approved Oil Trader (AOT) was introduced in 1989 and Approved International Trader (AIT) in 1990. The two programs were combined in 2001 and renamed as Global Trader Programme (GTP). GTP has evolved and is considered a main factor in transforming Singapore into a trading hub, not only for energy but also for other commodities.

This chapter reviews the status of oil and oil products that are exported and imported in Singapore. It analyses how oil and energy have contributed to the

economic growth of Singapore and examines what factors attributed to making Singapore an energy and commodity trading hub. Along with the review and analysis, it draws some lessons learned from the success story. This paper is structured as follows: Section 2 reviews the characteristics of Singapore's economy, Section 3 presents Singapore as an oil center, Section 4 explores how institutional factors helped Singapore became an energy and commodity trading hub, and Section 5 examines what implications can be drawn for energy market integration (EMI) from the case of Singapore. Section 6 concludes this paper.

Characteristics of the Singapore Economy

The main characteristic of the Singapore economy is the role of the government. The government appears to intervene in a wide range of economic activity and planning. The Singapore economy is considered a decisive departure from the market mechanism and a domestically managed regime. Its manufacturing sector is export-oriented and is controlled by the government. However, the economy shows that planning and the market appear as a creative partnership. The other key characteristics are the government-directed labour market, state-owned enterprises, and government-forced saving. The government-forced saving appears to help infrastructure and housing provision, and draw private sector investment and promote capital accumulation. Along with these, the government carried out plans for manufacturing development and made Singapore specialised in financial and business services. The successful transformation is also attributed to the utilisation of the country's natural comparative advantage of geographical location and the augmentation of this particular advantage (Huff, 1994).

A growth accounting analysis by the government that focused on the supply-side of the economy showed that foreign talents with employment pass and work permit were an integral building block for the economic success and contributed 41 percent of GDP in the 1990s (MTI, 2001). A demand-side analysis by the government identified four engines of economic growth—the US economy, worldwide semiconductor sales, ASEAN-2 countries (combined GDP of Indonesia and Malaysia), and domestic construction

works (MTI, 2002a). Another demand-side analysis shows how Singapore's engine of growth has changed since 1965 (MTI, 2002b).

Among others, trade is clearly shown as an 'engine of growth' in a demand-side analysis (MTI, 2002a and 2002b). Since its independence in 1965, 'the oil sector' has been an engine of growth and has contributed 1.1 percentage points to economic growth from 1965 to 1974, and 50 percent of domestic exports by commodity during the period. From 1975 to 1984, however, it has contributed a mere 0.4 percentage points to economic growth but still 47.6 percent of domestic exports by commodity during the period. This reflected the shrunk of the oil sector in Singapore due to external reasons after two oil shocks. From 1985 to 1991, the oil sector was no longer considered an engine of growth due mainly to the collapse of commodity prices, including oil, and its contribution to domestic exports by commodity has fallen to 26.1 percent. The oil sector has petered out from 1992 to 2001 and its contribution to domestic exports by commodity is just 18.3 percent. These changes present the structural shifts in the economy. Statistics show that the oil sector has contributed about 20 percent of domestic exports by commodity, 1–2 percent of value-added, and close to 1 percent of employment since 2002 (Department of Statistics, 2013).

Singapore as an Oil Center

Singapore was a strategic entrepôt even before its independence in 1965. At the time the oil sector was not much controlled by the government, the government did not block the oil sector from performing its business nor provided any incentive. The Shell oil company developed a distribution center of oil in Singapore in the 1860s and further added the functions of storage, bunkering, and blending (Horsnell, 1997). What was missing in the supply chain of oil then was refining. After independence, Singapore noted the missing channel in the supply chain of oil and invested in developing oil refineries. With this investment, the country emerged as an oil refining center with five refineries built within 12 years. The 12 year-drive for attracting foreign investments in oil refineries was done by mainly offering tax-free operations for the first five years. Following the initial success in building an

oil refinery industry and the sustained economic growth, Singapore faced a downturn and fluctuation of the refinery industry.

Fluctuations of the Singapore Refinery Industry

The favorable operation terms, including the tax-free operations for the first five years, were the key drivers for building five refineries in Singapore. There were other factors, however, that helped Singapore build the oil refinery industry. *First*, the threat of nationalising asset in Asia after the World War II made Singapore an oasis in Southeast Asia in the sea of Islam. *Second*, the economic boom in Japan after the World War II made Singapore the right place for refining crude oil for Japan, which asked Singapore to refine the crude oil that Japan imported from the Middle East. *Third*, the Viet Nam war provided Singapore the opportunity to be used as a channel for the US to supply oil and oil products to its troops. This accounted for over 20 percent of oil exports from Singapore. *Fourth*, Singapore has been an entrepôt since the 1890s and this helped Singapore acquire a comparative advantage in transporting oil and oil products (Horsnell, 1997).

The two oil shocks in the 1970s had negatively affected the world economy. Singapore was not an exception. The first oil shock changed the oil industry in Singapore as the shock made supply security a top priority for oil-importing countries. Japan withdrew its refining contracts from Singapore, which led to a huge cut in the demand for oil products. With this, Singapore's role in supplying oil products was diminished, but by then, it has already emerged as an oil trading hub in Asia and at the stage of transforming itself into a financial and business hub.

Growth of Trading in Singapore

In the mid-1980s, the trading of oil products was centered on Singapore, while crude oil trading took place in Tokyo. But Tokyo has given way to Singapore as Tokyo was an expensive place for doing business, has tight liquidity, and is considered high risk, in addition to the Japanese government's disenchantment with oil trading. All these worked as a push factor for Singapore to emerge as a center for physical oil trading (Horsnell, 1997).

Upon noticing a shrinking trend in the oil refinery sector, Singapore envisioned an oil trading center and introduced the AOT scheme. The scheme gave a concessionary a 10 percent tax rate on trading activity, which worked as a strong pull factor, attracting many trading firms to open their offices in Singapore. In addition, Singapore offered lower operation costs. Another factor that attracted firms to Singapore was its favourable time zone position. The operation hours of Singapore's exchange floor overlap with those of the US and Europe. By the time the US exchange floor closes, the exchange floor in Singapore opens, and by the time the Singapore exchange floor closes, the European exchange floor opens. Singapore can be connected throughout 24 hours. It also provides better living conditions and language options compared to Japan. Altogether, these factors helped Singapore become an oil trading hub.

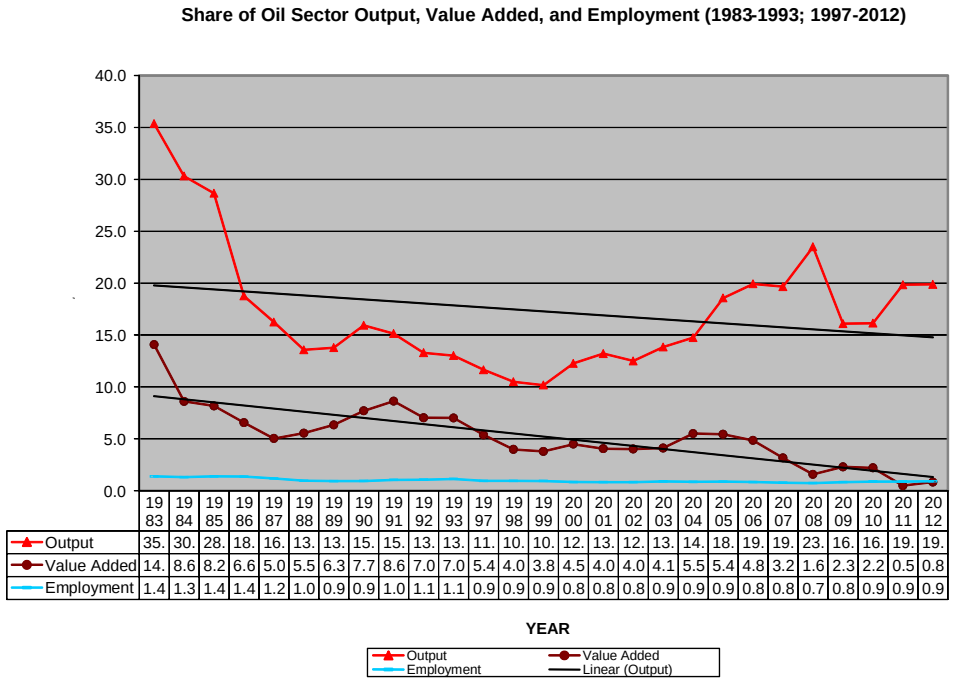
Oil in Singapore Economy

There were several engines of growth in Singapore and these changed over time (MTI, 2002b). Oil was one of the growth engines in the early days (Horsnell, 1997; Ng, 2012) and is still contributing about 10 percent of the total trade. The oil sector has helped in the successful transition of the Singapore economy into petrochemical and electronics industry. Unlike in the trade of goods and services, there is not much bilateral trade between Singapore and its trading partners due to the unique characteristics of oil and oil products trade. Singapore imports crude oil from various countries mainly from Middle Eastern countries and Australia, Viet Nam, and the Philippines in the region; refines crude oil at its integrated refinery; and exports oil products to Asian countries such as Hong Kong, Japan, and China, and to Panama and Liberia.

Figure 2.1 presents how the oil sector in Singapore has contributed to the economy from 1983 to 1993 and from 1997 to 2012. As stated earlier, the oil sector's contribution to the economy in the early years was higher than 2 percentage points in economic growth. This contribution has decreased to around 1 percent of value-added. A decreasing trend in the shares of manufactured output, value-added, and employment is shown over time. Increasing oil prices mainly contributed to the increasing trend in output, but value-added or profitability (i.e., refinery margins) have declined mainly due

to severe competition, and employment was stable or decreasing due to the integration of refinery and a productivity improvement that resulted in not creating much new employment. This also reflects that the Singapore economy has shifted to non-oil-based economy although the contribution of the oil sector is not negligible.

Figure 2.1: Contribution of the Oil Sector to the Singapore Economy

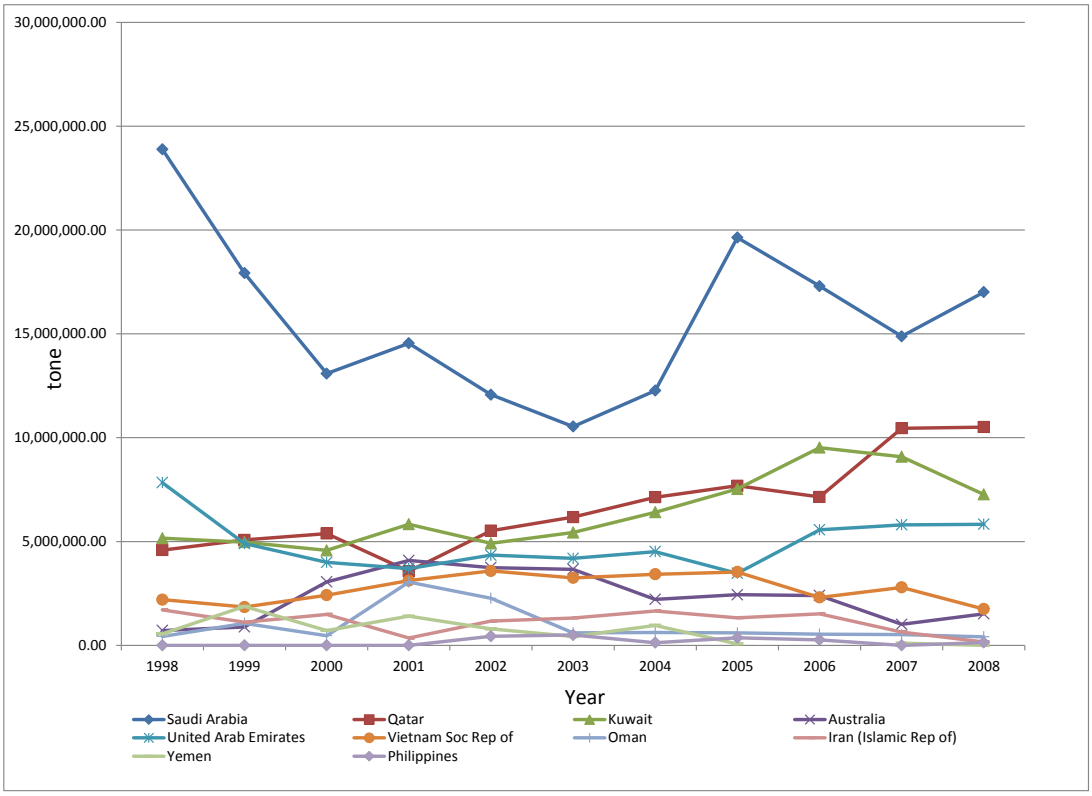


	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Output	35.	30.	28.	18.	16.	13.	13.	15.	15.	13.	13.	11.	10.	10.	12.	13.	12.	13.	14.	18.	19.	19.	23.	16.	16.	19.	19.
Value Added	14.	8.6	8.2	6.6	5.0	5.5	6.3	7.7	8.6	7.0	7.0	5.4	4.0	3.8	4.5	4.0	4.0	4.1	5.5	5.4	4.8	3.2	1.6	2.3	2.2	0.5	0.8
Employment	1.4	1.3	1.4	1.4	1.2	1.0	0.9	0.9	1.0	1.1	1.1	0.9	0.9	0.9	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.8	0.9	0.9	0.9

Source: Statistics of Singapore, *Statistic Yearbook of Singapore*, 1997 - 2012 issues.

Figure 2.2 presents the amount of crude oil that Singapore imports. As of 2008, 7 of the top 10 exporting countries are in the Middle East, and Saudi Arabia is the largest exporting country. Australia is the fourth largest exporting country, and Viet Nam and the Philippines are the Asian countries from which Singapore imports crude oil.

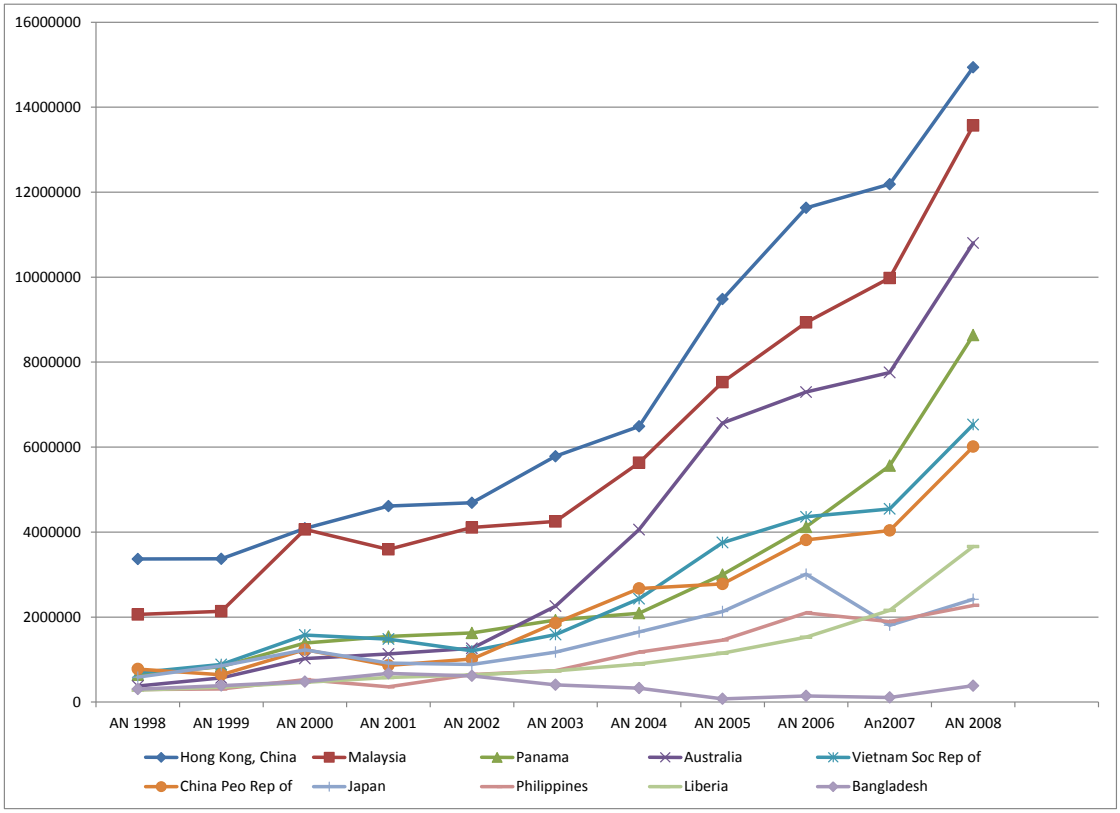
Figure 2.2: Ten Largest Petroleum Crude-Exporting Countries



Source: Statistics of Singapore, *Statistic Yearbook of Singapore*, 1998-2009, various issues.

Singapore, as an oil refining hub in Asia, imports crude oil from Middle Eastern countries and exports oil products. Figure 2.3 presents the countries to which Singapore exports most of its oil products. As of 2008, the largest volume of oil products is exported to Hong Kong, followed by Malaysia. Australia, China, and Japan are also among the top 10 largest importing countries. Panama is the fourth largest importing country. Singapore imports crude oil from Viet Nam and the Philippines and exports oil products to the two countries. Liberia is another country in the top 10 largest oil product-importing countries.

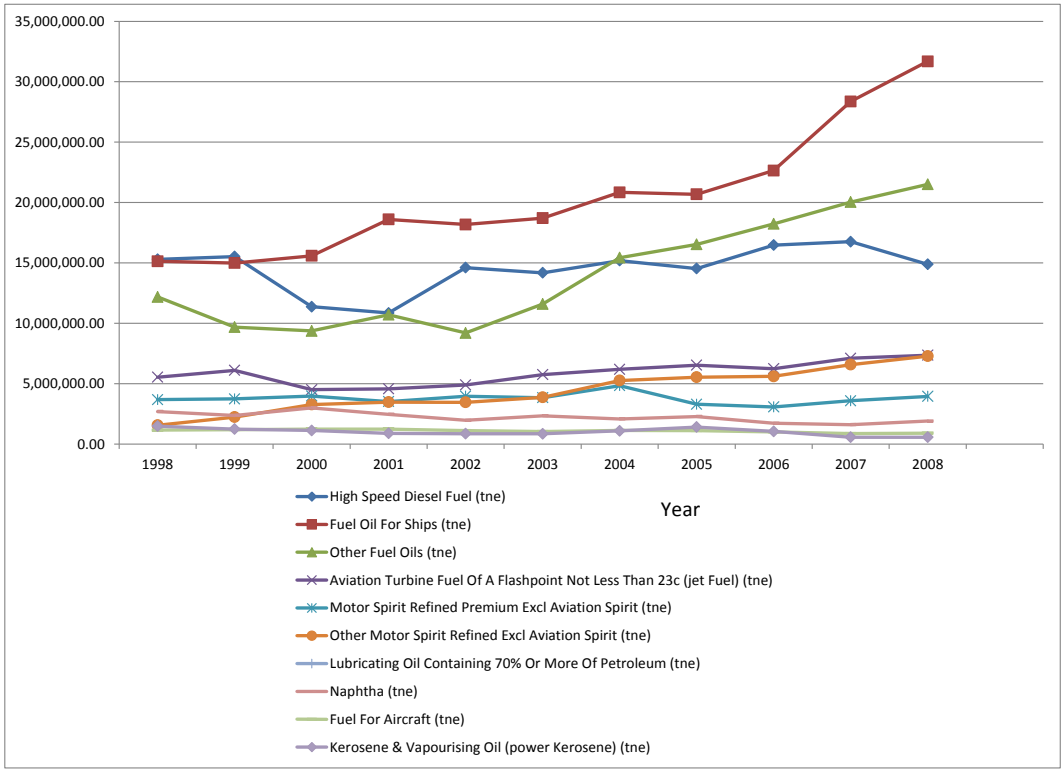
Figure 2.3: Top 10 Oil Product-Importing Countries



Source: Statistics of Singapore, *Statistic Yearbook of Singapore*, 1998-2009, various issues.

Singapore exports various oil products to many countries. Figure 2.4 shows the top 10 largest oil products exported from Singapore as of 2008. They are (1) high-speed diesel fuel, (2) fuel oil for ships, (3) other fuel oil, (4) aviation turbine fuel of a flashpoint not less than 23c (jet fuel), (5) motor spirit refined premium excluding aviation spirit, (6) other motor spirit refined excluding aviation spirit, (7) lubricating oil containing 70 percent or more of petroleum, (8) naphtha, 9) fuel for aircraft, and 10) kerosene and vaporising oil (power kerosene). The oil products that Singapore exports most are the fuels for shipping, aviation, and transportation. This reflects the fact that Singapore is an entrepôt and a shipping and aviation hub, and has augmented its natural comparative advantage to achieve its economic success. Singapore is located in the middle of the trade route between East and West and has a deep port—which are geographical competitiveness that may not be replicated by any other country (Huff, 1994). Together with institutional support, good government planning, and persistent drive, these geographical competitiveness helped Singapore become an oil trading hub in the region.

Figure 2.4: Ten Largest Oil Product Exports from Singapore



Source: Statistics of Singapore, *Statistic Yearbook of Singapore*, 1998-2009, various issues.

Some lessons can be drawn from the success story of Singapore's transformation from an oil distributing center into an oil trading hub and the achievement of its economic growth by creating and promoting the oil industry. The first lesson learned is the positive role of government in economic development. *Second*, it highlights the importance of investment in infrastructure and education. *Third*, it shows how successful economic planning can be undertaken—where the control over key macroeconomic variables was well managed and the coordination of public sector investment and attracting private investment was well implemented. *Fourth*, it shows the weaknesses and limits of government control where little delivery of technological gains in manufacturing was made.

Institutional Factors that Made Singapore an Oil Trading Hub

Along with the natural comparative advantage and its augmented competitive edge, a few institutional factors helped Singapore became an oil trading hub within a few decades. Among others, the AOT and AIT schemes, and later the Global Trader Programme (GTP), and the combined schemes of AOT and AIT were the main drivers.

AOT, which was for oil trading, was introduced in 1989 while AIT, which aimed for the trading of commodities other than oil, was introduced in 1990. These two schemes were merged in 2001 and became GTP under the auspice of the International Enterprise Singapore (IE Singapore), a government statutory. GTP had more than 270 international trading companies in Singapore and covers oil and carbon.

There are many merits of being under GTP but the most notable is a concessionary tax rate on qualifying incomes; the tax rates range from 5 percent to 10 percent. GTP encourages global trading companies to use Singapore as their regional or global base to conduct activities along the total trade value-added chain from procurement to distribution, in order to expand into the region and beyond.

The list of qualified products and commodities, which are to be reviewed periodically, includes petroleum and petroleum products, agricultural commodities and bulk edible products, building and industrial materials, consumer products, industrial products, machinery components, metals and minerals, and electronic and electrical products. The qualified transactions are principal trades with offshore parties or other companies with GTP status on both the buy and sell legs of the transaction. The physical trades that qualify are for offshore, goods does not pass through Singapore; for transhipment, transferring cargo from one transport mode to another and for re-export, only non-value added portion of re-export trade.

When applying for GTP status, an initial, non-renewable three-year GTP status is granted by IE Singapore. If during this period the company establishes its global trading network and demonstrates sustainable growth

projections, with Singapore as its base, it can apply for the renewable five-year GTP status. GTP has three minimum criteria. *First*, there must be substantial physical offshore trading turnover on a principal basis. *Second*, there must be significant local business spending attributable to trading activities in Singapore. *Third*, there must be employment of professional traders in Singapore. The other considerations are (1) the company should have an overall business plan and economic contribution to Singapore; (2) it uses banking and financial services available in Singapore; (3) it uses other Singapore-based services such as trade and logistics, arbitration, and ancillary; (4) it should contribute to manpower training and development of trading expertise in Singapore.

Implications for EMI

Market integration could mean the convergence to one price—"the law of one price" (Grossman, 1976; De Vany and Walls, 1999). Energy trading would help the one price be possible for energy commodities. Singapore, as the established oil and oil products trading hub in the region, can expand its scope of trading to other energy commodities, such as natural gas and electricity, and help one price for oil, oil products, or other energy commodities—such as natural gas and electricity—to prevail in the region by facilitating the trading of such energy commodities in the integrated energy market where buyers can find sellers and vice versa. Unless an energy market is integrated, matching buyers and sellers would be very costly if not impossible. The one price can be achieved when all parties involved are free to trade. Singapore can promote trading of not only oil and oil products but also of other commodities ranging from agricultural products to metals, electronics, and carbon. Such trading makes all the different prices converge to a single price. As the literature suggests, "the law of one price" is the evidence of market integration. Price convergence will make "the law of one price" prevail in the market. With an integrated market, there are more buyers and sellers and they could find better prices, which eventually makes one price prevail for the buyers and the sellers in the market. Both buyers and sellers find the right trading partner and they would benefit from participating in the integrated energy market, which could further promote and strengthen the EMI.

Unless an energy market is integrated, a buyer in one market is not able to get energy from a seller in the other market although the seller has a surplus. This translates into loss to both the buyer and the seller—the buyer must pay a higher price or will not get the energy it needs while the seller must give up the gains from selling its surplus in energy. Two separate markets cannot accrue such potential benefits from the integrated energy market. The working energy trading hub in the region would have countries in the ASEAN region see the price of energy goods traded and free to choose the better price so that it helps the energy price converge to a single price. Having an energy trading hub and linking it to other countries in the region helps each country quote the price determined in the trading hub and would eventually make a single price prevail in the market. By doing so the market integration could be completed. An energy trading hub would accelerate the EMI.

Conclusion

Singapore presents an interesting case where the government's intervention in planning and developing its economy helped in achieving an economic success. Along with its geographical location as a comparative advantage, Singapore provided much institutional effort in successfully transforming its position as just a distribution center of oil into an oil trading hub. At the center of these efforts are the AOT and AIT schemes, which later became the GTP. This promoted not only trading of oil and oil products but also the trading of other commodities, including carbon. The energy trading hub would facilitate the trading of energy commodities and make the price for the traded commodities converge to a single price by decreasing or eliminating the price gap between countries. This in turn would accelerate EMI by holding the law of single price for energy commodities in the market.

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