LUISS

Degree Program in Management and Computer Science

Course of Microeconomics

Foreign Direct Investment in ASEAN: a Biform Game

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Academic Year 2022/2023

1. Introduction

The Association of Southeast Asian Nations (ASEAN) has emerged as a pivotal force in shaping the global economic landscape. Comprising ten member states in Southeast Asia, ASEAN has rapidly evolved from a regional organization into a significant player in international trade and foreign direct investment (FDI)[1]. This paper explores the multifaceted relationship between trade and FDI in ASEAN from a game-theory perspective.

ASEAN, established in 1967, consists of Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam[2]. Together, they form a dynamic and diverse region that boasts a combined population of over 650 million people and a rapidly expanding middle class. This demographic dividend has transformed ASEAN into a tantalizing market for businesses around the world.

The strategic location of ASEAN, situated at the crossroads of major global trade routes, has also contributed to its trade growth. Its proximity to East Asia and the Pacific, coupled with a vast network of ports and transportation infrastructure, has made it an attractive hub for the movement of goods and services. Moreover, ASEAN's commitment to innovation and technology adoption has positioned it as a burgeoning digital economy. With a growing tech-savvy population and a thriving startup ecosystem, the region has become a hotspot for investments in sectors like e-commerce, fintech, and digital services.

Foreign Direct Investment (FDI) has played a pivotal role in ASEAN's economic development. The region has attracted substantial FDI inflows[3], drawn by its abundant natural resources, skilled labor force, and expanding consumer market. Government policies that promote investment-friendly environments, such as tax incentives and streamlined regulatory procedures, have further incentivized multinational corporations to establish a presence in ASEAN.

[1] https://www.adb.org/sites/default/files/publication/174835/adbi-wp545.pdf
[2] https://asean.org/about-asean/
[3] https://www.businesstimes.com.sg/international/asean/fdi-flows-asean-double-past-decade-regions-growth-potential-supply-chain

Trade within ASEAN has flourished over the years, driven by various factors. The organization implemented the ASEAN Free Trade Area (AFTA) in 1992, aimed at reducing tariff barriers and facilitating trade among member states. Subsequently, ASEAN signed numerous trade agreements with global economic powerhouses, such as China, Japan, South Korea, and India, underlining its commitment to open and inclusive economic engagement.[4] The ASEAN Economic Community (AEC), launched in 2015, seeks to deepen economic integration among member states. By eliminating non-tariff barriers, harmonizing regulations, and fostering greater cooperation in various sectors, the AEC aims to create a seamless and competitive economic region. This integration has not only boosted intra-regional trade but also enhanced ASEAN's attractiveness as a destination for FDI.

The interaction between FDI and trade goes beyond that. While trade and free trade agreements are generally believed to be mutually beneficial[5], countries capture varying shares of value from entering such agreements. For instance, Free Trade Agreements (FTAs) can be more advantageous for exporters since they eliminate taxes and protective measures on imported goods. A nation with a significant Foreign Direct Investment (FDI) presence is involved in manufacturing and consequently exports more products, thus reaping greater rewards from FTAs. This benefit accrues to the nation through two primary channels. Firstly, increased exports stimulate greater production demand for FDI enterprises, leading to increased local employment opportunities. Secondly, increased exports translate into higher profits for FDI companies, consequently boosting tax revenues collected by the local government. Summarily, past FDI located in a country might boost the share of value the country obtains from trade and trade agreements.

This setting of trade and FDI makes a perfect case for a game-theory model, in particular the biform game model proposed by Brandenburger and Stuart (2007). A biform game comprises of two stage games, a non-cooperative game followed by a cooperative game. Because of the benefits FDI brings to the economies, not only in trade but also other

[4] http://www.eastasiaforum.org/2016/02/06/trade-agreements-are-in-aseans-best-interests/
[5] Ibid.

aspects of growth, countries often introduce aggressive policies, such as preferential tax treatments, to attract FDI. Such competition for FDI fits in a non-cooperative game, where players are countries. Furthermore, previous FDI-allocation, the result of that non-cooperative game, would affect the bargaining position, or equivalently the value share, that countries obtain in trade and trade agreements. For the mutually beneficial nature of trade agreements, their outcomes can be reasonably characterized by a cooperative game.

This paper applies a biform game model to understand how future trade can induce countries to compete (more aggressively) for FDI, and under which condition FDI-incentivizing policies are no longer optimal. The rest of the paper will be organized as follows. Chapter 2 provides an overview of competition for FDI at the global level, the common practices as well as benefits and drawbacks of FDI competition. Chapter 3 analyzes in detail FDI policies in ASEAN, focusing on two countries Malaysia and Singapore. Chapter 4 introduces the biform game model and applies it to study the interaction between FDI competition and trade agreements in ASEAN. Chapter 5 concludes.

2. Competition for FDI[6]

2.1. Global Competition for FDI: Pros and Cons

The intensifying global competition among governments to draw in foreign direct investment (FDI) can yield positive outcomes. These benefits may encompass incentivizing governments to bolster the foundational aspects of their economies. For instance, government strategies such as investing in modern infrastructure and adequately training their workforce, ensuring macroeconomic and political stability, and enhancing long-term economic growth prospects can foster economic development, irrespective of their immediate impact on FDI inflows. Another consequence may be an increased global supply of FDI, advantageous for both investors and the host nation's economy. The competition among local governments to attract FDI also contributes to more comprehensive policy reforms, encompassing regulatory adjustments, privatization, and the liberalization of trade and investment policies. Additionally, this process tends to motivate local governments to modernize, enhance their organizational efficiency, and become more adaptable, thereby boosting the competitiveness of their regional economies.

Countries can vie for FDI by augmenting the availability of public resources to the economy, alongside or instead of offering incentives or tax concessions to foreign investors. While incentive-based competition can be fierce, the evidence suggests that it primarily occurs in specific industries (e.g., automotive) or for particular investment projects, especially large ones, and during specific periods. Most of this competition is typically regional in nature, as governments vie for investment destined for particular areas.

Although the evidence doesn't definitively point to an inexorable trend of a global "bidding war" among governments competing for FDI, the concept of a "prisoner's dilemma" perpetuates the ongoing risk of such competitive battles. Offering costly investment incentives can be counterproductive for a government if the fundamentals of the potential investment sites within its jurisdiction do not meet the basic criteria. This can ultimately harm both the local economies and investors in the long term. Incentives, in addition to introducing distortions, may attract the "wrong type" of investors and make the

[6] This chapter draws heavily from OECD (1998) and UNCTAD (1996).

policy-making process more susceptible to profiteering and corruption, which can be highly detrimental. These effects, in turn, undermine the economy, democracy, and the development of a modern state, thus impeding the overall development process.

The indiscriminate use of investment incentives and other discretionary policies to attract FDI can negatively impact FDI inflows, as they are often seen as unsustainable by investors. While governments often justify these incentives by claiming they are needed to direct business investments to poorer areas, they may inadvertently exacerbate inequality instead of alleviating it.

The competition among local governments to attract FDI has been triggered by a broader process of policy reform, including regulatory changes, privatization, and trade policy liberalization. In addition to reinforcing market forces, this process encourages local governments to modernize, improve their efficiency, and become more adaptable, thereby enhancing the competitiveness of the economies within their jurisdiction.

International regional integration agreements can serve as potent instruments for attracting FDI, provided they involve relatively open regional pacts and promote cooperation among governments. Such agreements can help mitigate the adverse effects of political competition, including pressure to lower labor and environmental standards, as well as costly battles for incentives among neighboring regions. The nature of the prisoner's dilemma in FDI competition constantly raises the risk of expensive bidding wars among neighboring regions. Additionally, there is persistent pressure to lower environmental and labor standards, issues that national governments may struggle to address without enhanced international policy coordination.

2.2. Competition for FDI by Incentives: Overview of Common Practices

As a result of a comprehensive international survey conducted between the mid-1980s and the early 1990s, spanning 103 countries including both OECD and non-OECD nations, data collected and published by entities like Price Waterhouse, Economic Intelligence Unit, Arthur Anderson, and others in periodic national reports on local economic and business conditions shed light on how countries engaged in competition

through the use of incentives, notably tax incentives. The findings indicate that non-OECD governments tended to rely more heavily on tax incentives as opposed to fiscal incentives, which was in contrast to the trend observed among OECD governments. According to UNCTAD, this disparity can be attributed to two primary factors[7]. First, financial incentives offer greater administrative flexibility to governments than tax incentives, but non-OECD governments often lack the resources required to provide direct financial incentives to the same extent as their OECD counterparts. Second, the introduction of tax incentives in OECD countries often involves complex parliamentary approval processes. It's worth noting that the UNCTAD report primarily focuses on incentives offered by national governments and does not delve into incentives introduced at the local government level[8].

A substantial and increasing number of nations have tailored their incentive programs to attract investment in specific industries or geographic regions[9]. The main focal points, in decreasing order of frequency, include:

i) Particular industries, particularly those in high-tech and high-value manufacturing, such as the software and electronics sectors, contemporary infrastructure development, the establishment of regional headquarters for major corporations, and corporate investments.

ii) Specific regions characterized by higher levels of poverty or unemployment, with Europe being a prominent example.

iii) Promoting exports, especially in developing countries, with targeted incentives designed to attract investments geared toward export-oriented activities. The TRIMs agreement from the Uruguay Round has strengthened this approach by limiting nations' ability to impose export performance standards on investors.

iv) Encouraging research and development (R&D), workforce development, and, particularly in OECD nations, facilitating employment retention or job creation.

[7] UNCTAD (1996)
[8] OECD (1998)
[9] UNCTAD (1996)

OECD nations tend to employ financial incentives at the sub-national government level, focusing on stimulating investment in specific regions and promoting job creation and preservation.

On a positive note, some countries have taken steps to reduce their reliance on tax incentives. For instance, Indonesia eliminated tax exemptions in 1984, and Korea reduced both barriers and preferences for FDI. In Malaysia, the significance of tax incentives has been diminished by lowering the base tax rate for all businesses. However, these efforts have been relatively limited in number and do not appear to have significantly mitigated incentive-based competition in general. In fact, Indonesia even reintroduced tax exemptions in 1997.

3. FDI Policies of ASEAN Countries[10]

Countries in Asia, especially Southeast Asia, have witnessed a large amount of foreign investment. FDI streams to the developing countries in Asia increased from a yearly average of $13 billion (55 percent of all developing countries) in the latter half of 1980s, to $87 billion (58 percent of all developing countries) in 1997. The share of four countries, Malaysia, Singapore, China, and India, in developing-Asia FDI inflows went from 51 percent in the latter half of 1980s, to 72 percent in 1997. Interestingly, two ASEAN countries saw a decline (the share of Malaysia fell from 8 to 4 percent and that of Singapore fell from 22 to 12 percent), while China and India saw their shares rose from 20 to 52 percent and from 1 to 4 percent, respectively. To better understand foreign investment in ASEAN, Malaysia and Singapore will be good examples. The following subsections analyze historical policies, recent trends, and implications for economic development of FDI competition in these two countries.

3.1. Malaysia and FDI Competition: Policies, Trends, and Implications

Historical Policies

Since gaining independence in 1957, Malaysia has accorded a central role to foreign direct investment (FDI) in the development of its economy. This significance is evident in its high FDI stock to GDP ratio, which stands at 49%, second only to Singapore's impressive 72%. This ratio is approximately twice that of Indonesia (25%) and several times greater than Thailand (12%), the Philippines (10%), and all other developing Asian countries (15%). Over time, FDI inflows to Malaysia have increased significantly, growing from an annual figure of nearly $1 billion in the period from 1985 to 1990 to a relatively stable annual average of $4.6 billion in 1991 to 1996, followed by $3.8 billion in 1997, with the drop in the latter year attributed to the Asian financial crisis.

The development of Malaysia's FDI policy can be divided into three distinct stages. The first phase, from 1957 to 1968, corresponds to an era of import substitution industrialization. During this period, Malaysia utilized import restrictions and financial

[10] This chapter draws heavily from OECD (1998), Sieh Lee (1988), and Chia (1998).

incentives with moderate effectiveness to attract FDI in the manufacturing sector, mainly focusing on producing consumer goods for the domestic market.

The second stage, spanning from 1968 to 1982, witnessed a shift in policy towards attracting export-oriented FDI. This period saw the introduction of the Investment Incentives Act of 1968, which provided significant fiscal incentives to entice FDI, especially in emerging industries like electronics. The goal was to stimulate job creation, as Malaysia marketed itself as a low-cost manufacturing hub with a readily available and affordable workforce. Additionally, this period saw the proliferation of "free trade zones" or tax-free export-processing zones, where foreign manufacturers could employ local workers, typically young women from nearby areas.

During this period, the "New Economic Policy" was introduced following the "race riots" of 1969. This policy, in effect from 1980 to 1990, aimed to promote the economic interests of the native Malay population by limiting foreign ownership of firms to 30% and allowing non-Malay Malaysians to hold 40%. This encouraged the formation of minority-foreign-owned joint ventures. Malaysia increasingly made concessions and efforts to create an attractive investment environment, including tax incentives.

The third phase, which began in 1982 and continues to the present day, focuses on an integrated approach where trade and investment reinforce each other. Manufacturing FDI plays a crucial role in promoting trade in intermediate goods and services. This policy shift was influenced by economic challenges in the mid-1980s, leading to the relaxation of foreign equity ownership restrictions from 1985 to 1990. The appreciation of the Japanese yen following the Plaza Accord also prompted substantial production capacity relocation to Malaysia, particularly in the electronics sector. This led to increased FDI inflows, boosting export growth and maintaining Malaysia's high average annual GDP growth rate of 9%, albeit with a growing trade deficit.

The third phase of Malaysia's FDI policies acknowledges the need for foreign affiliates to import intermediate goods and services when local alternatives are unavailable or do not meet global quality standards. This phase also focuses on promoting high-tech and knowledge-intensive industries for future global competitiveness. Policies emphasize

the development of manufacturing and services along value-added chains, leveraging information technologies, training and skill development, and attracting major corporations' regional headquarters and international procurement centers.

Trends

Formal monetary incentives were introduced through the 1968 Venture Incentives Act, marking a policy shift towards attracting export-oriented manufacturing FDI. The primary objective of providing monetary incentives has remained consistent over time, with recent expansions to encourage investment in specific infrastructure or service sectors, such as capital-intensive telecommunications and large convention and resort facilities. The 1986 Development of Investment Act, amended in 1991, offers incentives to encourage both local and foreign investors to engage in capital and technology-intensive ventures, fostering domestic industrial linkages, R&D, workforce training, tourism, infrastructure development, and support for smaller businesses, among other areas.

Another significant incentive for FDI is the exemption of most imported machinery and equipment necessary for investment projects from import duties, surtaxes, and sales taxes. These exemptions are temporary measures aimed at preventing disruption during the initial phase of industrial projects or safeguarding local production. Malaysia's reliance on tariff and border duties for revenue has decreased over time as the economy has become less dependent on these sources.

Implications

Malaysia's historical use of fiscal incentives, combined with political stability and sound macroeconomic policies, has played a significant role in attracting manufacturing FDI, particularly in the electronics sector, contributing to the nation's success since the 1970s. However, industry-specific incentives have introduced significant distortions, although the exact magnitude remains difficult to quantify. While these incentives may have indirectly contributed to current account deficits in the 1990s, their role in the 1997

financial crisis is disputed, given Malaysia's long history of incentive use and the absence of evidence showing increased use before the crisis.

Malaysia faced increasing competition from ASEAN's new Indochinese members and China, potentially intensifying the competition for FDI among emerging Asian countries after the crisis. The creation of an ASEAN Investment Area (AIA) in response to this growth in competition, complementing the ASEAN Free Trade Agreement (AFTA), aimed to foster better cooperation among ASEAN nations, reducing intra-regional competition by presenting ASEAN as a unified region to foreign investors. However, there is uncertainty regarding the benefits of AIA, especially as member nations reconsider the wisdom of portraying a common ASEAN image while managing the economic fallout from the crisis.

In conclusion, FDI promotion remains crucial for Malaysia, with efforts needed at both regional and national levels, including cooperative and competitive strategies to attract investment in various sectors and industries.

3.2. Singapore and FDI Competition: Policies, Trends, and Implications

Historical Policies

Prior to gaining independence in 1965, Singapore recognized the significance of foreign direct investment (FDI) in driving its economic growth. The People's Action Party, in power since independence, consistently prioritized attracting FDI to support the country's highly successful export-oriented industrialization agenda. Singapore's commitment to FDI is underscored by the highest inward FDI stock to GDP ratio globally, standing at 72%. This is further evident in the fact that foreign investors contribute 90% of the value added in Singapore's electronics industry, which has been a key driver of the country's export and income growth over the past three decades. Foreign investors also hold two-thirds of the equity capital in Singapore's manufacturing sector. Remarkably, Singapore, with less than 1% of the population of all ASEAN nations, hosts one-third of the total inward FDI stock for the entire ASEAN region. FDI inflows to Singapore surged from an average of $3 billion annually in 1985-1990 and $4.3 billion annually in 1991-

1994 to $8 billion in 1995, $9 billion in 1996, and $10 billion in 1997, accounting for approximately 40% of the combined FDI inflows to all ASEAN countries in 1997.

In the early 1960s, after gaining independence, Singapore's government recognized the need for FDI to industrialize the economy and create jobs, considering local capital and entrepreneurship insufficient for this purpose. Local businesses were primarily engaged in porting and retail trade, lacking experience in production for foreign markets. Additionally, Singapore lacked a sizable domestic market to compensate for the learning curve of emerging manufacturing businesses, unlike Chinese Taipei and South Korea, which depended on import substitution.

As a solution, Singapore embraced FDI to facilitate successful industrialization, job creation, and long-term improvements in living standards. The financial influx accompanying FDI in those early years helped cover the current account deficit, finance net imports, and bridge the investment and domestic savings gaps. By the 1980s, Singapore's GDP and export capacity had grown significantly, raising income levels. While Singapore became a net investor of capital, it continued to rely heavily on FDI for entrepreneurship, management skills, technology, and marketing networks. Singapore's remarkable dependence on FDI also shielded its economy from current account deficits and debt crises experienced by many other developing economies. Singapore saw a substantial and growing current account surplus since 1988, driven by its high domestic savings rate (49% of GNP) compared to an investment rate of 35% in 1995. This surplus, along with significant capital inflows, bolstered Singapore's foreign exchange reserves and outbound investments, helping protect it from the crises affecting its neighbors in the 1990s.

Trends

To attract the highly competitive manufacturing FDI it sought since the 1960s—FDI that was more mobile than natural resource-seeking or import-substitution manufacturing FDI and competitive in global markets from the start—Singapore implemented extensive policies to enhance the business environment. These policies

included maintaining political and macroeconomic stability, promoting labor discipline and peaceful industrial relations, reforming the educational system, emphasizing engineering, technical, and industrial skills in labor training programs, developing industrial infrastructure, actively encouraging investment, and providing generous tax incentives. Singapore's economic policy has been characterized by open trade and FDI policies since independence, although there is no specific law governing foreign investment. Therefore, Singapore's policy phases do not align with legislative changes in FDI policy or degrees of economic openness, but rather with changes in the focus and expertise of policy design and implementation.

In the 1960s, Singapore took draconian measures to improve the political and industrial relations climate by imprisoning communists and implementing labor legislation. This, combined with generous fiscal incentives and proactive investment promotion, attracted a wave of manufacturing FDI between 1968 and 1973. These efforts capitalized on the initial relocation of labor-intensive electronics assembly activities by US and European companies to low-wage "offshore" production sites in developing nations. Singapore experienced double-digit economic growth and the elimination of unemployment during this period.

However, between 1974 and 1976, FDI inflows sharply declined due to the collapse of the Bretton Woods system, the first oil shock, and a global recession that weakened the global investment climate. The late 1970s and early 1980s saw stagflation and recession in the US and European economies, leading to a new wave of FDI inflows to Singapore from 1978 to 1984, as companies sought cost-effective production relocation.

A loss of export competitiveness, a significant rise in operating expenses, and a strengthening Singapore dollar led to a decrease in FDI inflows and a recession in 1985-1986. The government suspended industrial structural reforms, implemented cost-cutting measures, and launched an aggressive investment promotion campaign. Since 1986, FDI inflows have steadily increased, accompanied by economic restructuring and growth in industries like specialty chemicals, pharmaceuticals, computer hardware and software, advanced electronic components, precision engineering, and medical equipment. As

Singapore evolves, it faces competition from OECD nations to attract high-value-added and high-tech FDI.

Singapore has adapted its investment promotion efforts to target smaller but highly innovative international enterprises since the late 1980s. It recognizes the importance of regional integration and has adjusted its policies to seize opportunities resulting from the increasing globalization of OECD-based corporate activity. Singapore encourages investors to relocate labor-intensive production to ASEAN nations with access to a workforce and more land while upgrading and automating production. Additionally, Singapore aims to attract regional service centers and operations headquarters by leveraging its skilled workforce, efficient infrastructure, financial services, cultural and commercial ties to Asian Pacific nations, administrative efficiency, political stability, and macroeconomic stability.

Implications

Singapore's long-term strategy to attract FDI since the 1960s has relied on generous fiscal incentives as a crucial component. These incentives offer flexibility and are preferred over other policy tools influencing investment decisions. The Economic Development Board, established in 1961 to lead Singapore's economic growth and FDI attraction efforts, typically avoids financial subsidies except for training and research and development (R&D) initiatives. Instead, fiscal incentives like tax holidays and concessions are consistently employed.

Over the years, Singapore has adjusted its tax incentives in response to economic conditions. Tax holidays were initially introduced in 1959 for "pioneer" manufacturing investments in new activities. Later, incentives expanded to include industrial expansion, export promotion, industrial enhancement, and R&D. In 1979, an investment tax credit scheme was introduced to support upgrades and firms with extended development periods. Additional incentives encouraged investments in technologically advanced industries and R&D activities.

Both international and domestic investors typically qualify for these tax benefits, applied generally and on an individual, discretionary basis. However, as in other countries, incentive programs favoring large or technically complex projects and export promotion tend to benefit foreign investors more in practice.

Notably, despite offering a range of fiscal incentives, Singapore has consistently increased corporate income tax revenue over the years. This has enabled budget surpluses to cover current expenses and substantial investment outlays. The surplus has allowed Singapore to gradually reduce its corporate income tax rate from 40% in the 1960s to its current rate of 26%. The relatively lower corporate income tax rate serves as a significant attraction for FDI, although it diminishes the impact of other fiscal incentives.

Singapore seems to be shifting its policy approach to FDI, emphasizing rule-based policies alongside its long-standing use of fiscal incentives. This shift coincides with increasing competition for FDI from other ASEAN members, emerging and developed economies, and OECD nations.

3.3. Will Policy Competition Intensify?

The more accommodating policies that ASEAN countries offer to foreign investors, the more intense the competition for Foreign Direct Investment (FDI) and economic growth among them becomes. However, predicting a probable increase in this competition in the future is challenging due to two main reasons.

Firstly, the substantial rise in global FDI flows since the mid-1980s, in comparison to global trade flows and as a percentage of global economic output, has served as a catalyst rather than a consequence of governments' increased focus on attracting FDI. Governments have been driven by the desire not to miss out on their share of this investment growth. While it remains uncertain whether the current high level of global FDI flows will persist over the long term, there is little basis for anticipating a further surge relative to global trade and economic output.

The second reason why it's unlikely for policy competition for FDI to intensify further is that, in recent decades, many countries have shifted their focus away from

domestic development strategies that were often perceived as unfriendly to FDI by foreign companies. The majority of countries have now embraced this shift in policy orientation. Consequently, while competition for FDI may remain intense, there is little reason to expect it to escalate further.

However, this does not imply a decrease in the competition for FDI, particularly among the rapidly growing economies of ASEAN. The current focus of interest, which may be considered positive, is centered on enhancing the overall economic health. A recent study conducted by Raeskyesa and Suryandaru in 2020 highlights that contemporary FDI flows are most strongly influenced by factors such as flexible institutions, market size, health, and primary education. These findings send a clear message to ASEAN governments, which are still deliberating between adopting sustainable policies that bolster competition in their domestic markets and favorable policies that may only attract the attention of foreign investors in the short term.

4. Application of Bi-form Game to FDI Competition in ASEAN

4.1. Bi-form Game: Overview and Practical Applications

The biform game model, introduced by Brandenburger and Stuart (1996; 2007), is a multi-stage game that comprises a non-cooperative game stage and a subsequent cooperative game stage.

A non-cooperative game involves players making decision in a competitive environment, where individual interests are not only not perfectly aligned but also possibly contradicting. The study of non-cooperative games dates all the way back to Nash (1951), when in his seminal work Steve Nash introduced the concept of Nash equilibrium. Common examples of non-cooperative games include classic competition games like Bertrand competition, Cournot competition in economics, and strategic games in politics. In business strategy, non-cooperative game theory finds its application in important settings, such as market entry decisions, marketing strategies among competitors, and R&D investment decisions. Noncooperative applications, in fact, are more numerous. This is perhaps because of they can be easily analyzed under the standard game-theory representation of matrices and game trees. Ghemawat (1997), for instance, provides many examples of such applications.

A cooperative game, on the other hand, is one where players interests are at least partially aligned. At a general level, one can think of a cooperative game as one in which players decide how big of a "pie" they would make, and once that "pie" is made, how to divide it among the contributors. In business strategic settings, a cooperative game focuses on the bargaining among players, where priori prices are absent. It is, therefore, appropriate to use such framework to analyze interactions that involves bargaining power, such as those between buyer and seller, supplier and producer, and producer and distributor. The study of bargaining power also has a long and decorated tradition, dating back at least to the "Five Forces" framework introduced by Porter (1980), which is still popular among managers in investigating the industry-level competitive environment. Eventually, it must be emphasized that all players realize shares of profit from their interactions (hence the terminology "cooperative"). A cooperative game, however, can still characterizes decision-

making in a competitive environment, that is one in which players are self-interested and profit-maximizing, yet the competition often is not among players. For example, sellers competing by prices is more appropriately characterized by a non-cooperative game, but a seller and a buyer negotiating on a price can be a cooperative game if a trade is beneficial to both.

Brandenburger and Stuart (2007) combined both models in a novel game-theory model, which are referred to as the "biform game" model. There are two stages in a biform game. The initial stage is a noncooperative game, which aims to depict the strategic decisions made by the players where they have to directly compete. These decisions can encompass various aspects such as market entry, market position, branding, production capacity, research and development, among others. In a broader sense, we can view these initial stage decisions as the establishment of the players' strategic capabilities. However, the outcomes of these initial decisions do not directly yield payoffs. Each set of decisions made by all players during the first stage maps to a cooperative game, which would be the second stage. This cooperative game reflects the competition landscape that arises from the decisions made in the first game. This second-stage game aims to provide insights into how much value will be distributed to each player, which is equivalent to giving the final payoffs for each player. Essentially, the biform game formalizes the concept that business strategies have a profound impact on shaping the competitive environment, and in turn, influence the financial outcomes and success of the individual players.

4.2. FDI Competition and Trade in ASEAN from a Biform Game Perspective

The Biform Game

Consider the following biform game. Two players are two countries in ASEAN, Malaysia and Singapore. In the first-stage game, Malaysia moves first, choosing between two actions: "compete" and "not compete". Subsequently, Singapore also chooses between "compete" and "not compete". Each set of decisions made by the two players (countries) would result in a different second-stage game, in which countries decides their trade policies, taking their stock of FDI as given. In a second-stage game, each country would

face the decision whether to sign a free trade agreement (FTA). The FDI stock of each country, the result of their first-stage actions, would determine their position in the second-stage game.

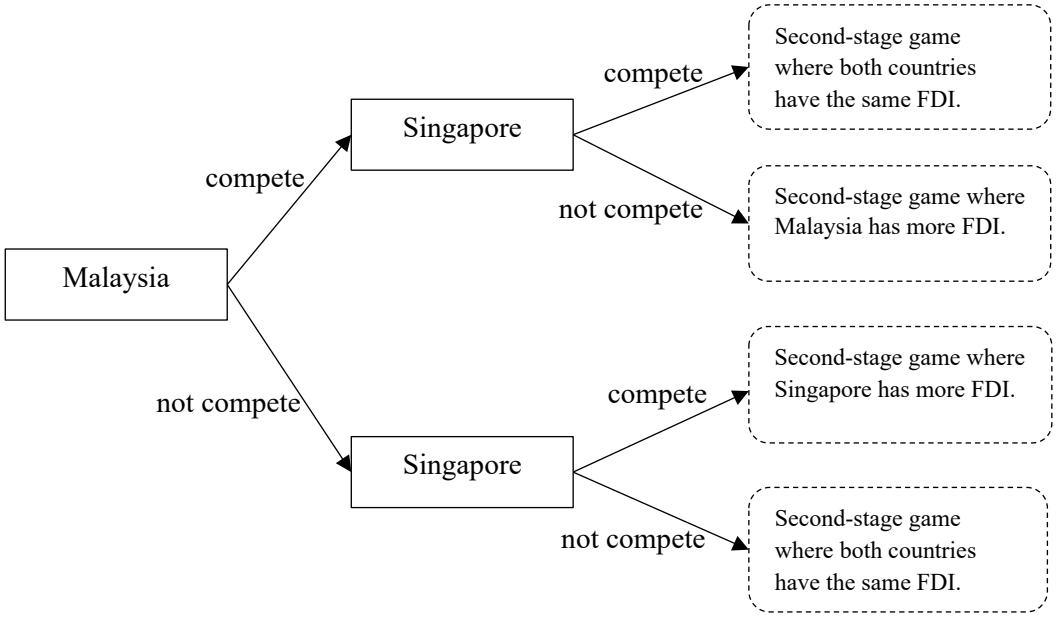

Figure 1. First-stage Game of FDI Competition.

The first-stage game tree is pictured in Figure 1. Under the symmetry assumption that the two countries have the same set of choices and payoff structure, decisions in the first-stage game can only lead to two possibilities: one is a second-stage game where one country has higher FDI stock than their counterpart, the other one is a second-stage game where two countries have the same FDI stock. The payoff structures of these two games are given in the matrix form in Figure 2 and Figure 3.

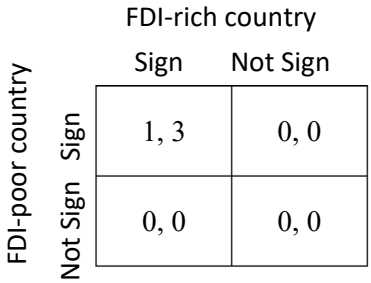

Figure 2. Second-stage game between FDI-rich country and FDI-poor country.

Figure 3. Second-stage game between two countries with the same FDI stock.

In the second-stage game between two countries, one with higher FDI stock than the other, the country with higher FDI stock would benefit more from a free trade agreement (FTA). This shows in Figure 2: if both countries agree to sign FTA, the FDI-rich country has a payoff of 3 while the FDI-poor country has a payoff of 1. In reality, FTAs benefit exporters, because foreign goods are no longer subject to taxes and other protectionist policies. A country with high FDI stock is manufacturing and therefore exporting more goods, therefore benefit more from FTAs. The country realized such benefit via two channels. First, export increases demand for production of FDI firms, creating more local employment. Second, export increases profits captured by FDI firms, increasing tax revenue collected by the local government. If two countries have the same

FDI level, they are assumed to capture the same gain from signing FTA, receiving a payoff of 2 each.

Here it is important to highlight that signing the FTA is the weakly dominating strategy, and being able to agree on signing the FTA would benefit both countries. However, the share of value from such agreement allocated to a country depends on the level of FDI allocated to that country after the previous stage game, which in turn depends on the decisions they made while competing for FDI. Therefore, the second-stage game qualify as a cooperative game, where players bargain on the share of value that they each receive from taking a "cooperative" action (i.e., signing the FTA). Their bargaining power, mapping directly to their final payoffs, are decided by actions in the first-stage non-cooperative game (i.e., directly competing for FDI).

Assumptions

In the first-stage game, Malaysia is chosen to move first. This assumption is justified by the fact that Malaysia is the country that has been around for longer and had implemented FDI policies even before Singapore gained its independence. However, as we will see later once the game is solved, this first-mover assumption plays no role in the outcome of the game. Therefore, the sequential first-stage game is equivalent to a game in which two countries make their moves at the same time. Such simultaneous (static) game is not primarily considered because policy making is often a process that last up to years, thus it is difficult to interpret what "same time" means in this context.

The choice set of each country comprises of only two actions, "compete" and "not compete". Here, to "compete" means to implement aggressive polices that incentivizes FDI inflows, such as massive tax breaks or favorable land renting policies. As discussed in the previous sections, such policies might seriously distort the local markets and hamper fundamental economic development. However, for now we assume implementing "compete" is costless to the country. The assumption is justified if the benefits of FDI to local markets outweigh or at least compensate for the harms distortive policies cause. Later we will also consider the case when choosing "compete" impose an upfront cost onto the

country. Indeed, such changes in the up-front costs (or alternatively, benefit) of actions will affect the outcome of the game.

Another assumption worth noting is that the players in the first stage only have two actions, which are discrete. In reality, governments have much more flexibility in policy making. For instance, they can choose to implement an FDI-incentivizing policy for one year or ten years, or not to implement the policy at all. They can also choose to implement one or tens among hundreds of possible policies that affect FDI flows. Therefore, it would be more realistic to allow players in this game to choose from a larger menu of choices, or even making a continuous decision. For example, countries may choose from a continuum a degree of aggressiveness to compete in the FDI markets. The assumption of only two (extreme) actions, therefore, can be seen as a simplifying assumption. This would allow us to analyze the biform game readably, because each set of decisions by the two players would lead to a separate second-stage game that would need to be solved. If we allow for 4 actions per players, it will mean that we will have to solve 16 second-stage games. That would sacrifice the interpretability of the analysis, though we will see that not every second-stage game is necessarily entirely different.

The final assumption on the first-stage game is that the two countries are the same, i.e., the game is symmetric. Of course, Malaysia and Singapore are hardly similar economies, both in term of size and institution. The assumption, nevertheless, serves well to consider the interaction of "equal" countries in ASEAN, so it would apply to any arbitrary two countries or multiple countries once we abstract from differences in their economies. An alternative interpretation is that size (or how the economy is structured) is either proportional or irrelevant to the benefits and costs of FDI inflows and trades agreements, so we can safely ignore such differences between countries.

Solving the Game

Follow the procedure outlined in Brandenburger and Stuart (2007), the game will be played as follows. Consider the second stage. In both possible games (one in Figure 2 and one in Figure 3), there are two Nash equilibria, the first being (Sign, Sign) and the

second being (Not Sign, Not Sign). Since it is obvious that being able to agree on signing FTA would benefit both parties, the former equilibrium is the "cooperative" outcome, which is more reasonable to our analysis. To eliminate the unwanted equilibrium (Not Sign, Not Sign), we can either allow for negotiating between the two parties, which is not far from practice: countries usually sit down at meetings to discuss such matter. Alternatively, we can make the game sequential: if one country moves first and offer to sign the FTA, the other would also sign, because then the later is weighing between "Sign" (which pays either 1 or 2) and "Not Sign" (which pays 0). So as results of the second-stage game in which one country has more FDI stock, the FDI-rich country would receive 3, while the FDI-poor would receive 1. If two countries have the same level of FDI, they both receive 2. The pair of actions chosen are always (Sign, Sign).

The results of the second-stage, cooperative games yield an induced noncooperative game, which is effectively our first-stage game.

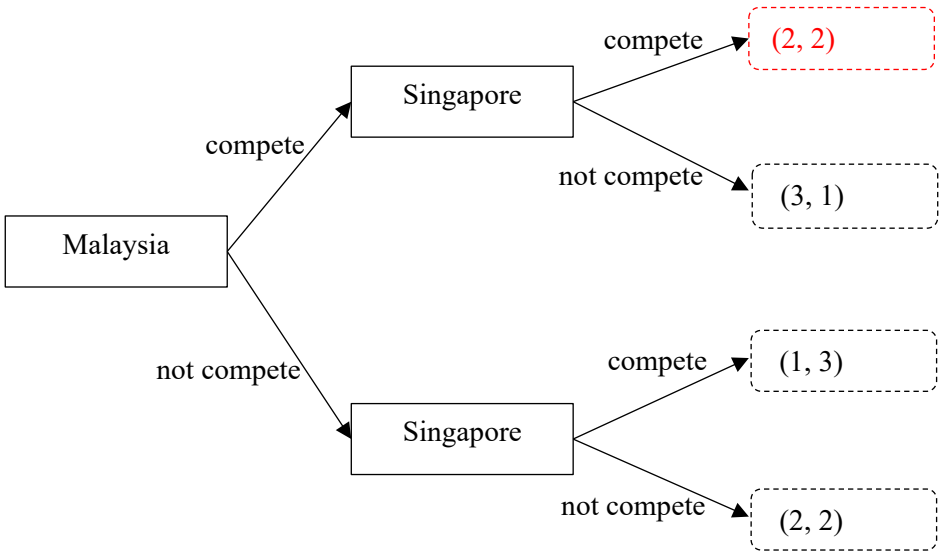

Figure 4. First-stage Game with payoffs derived from second-stage games.

Now the first stage is a simple sequential game that can be solved by backward induction. If Malaysia chooses "Compete", Singapore will choose "Compete" because 2 >

1. If Malaysia chooses “Not compete”, Singapore will choose “Compete” because 3 > 2. So, Malaysia will obtain payoff 2 by choosing “Compete”, which is higher than payoff 1 obtained by choosing “Not Compete”. The only (sequential) Nash equilibrium of this game is (Compete, Compete).

The result of our game is very stark. The best responses of both countries would always to “Compete”, that is to implement aggressive FDI-attracting policies. The rationale behind that each country would want to have a larger stock of FDI before entering the stage where they negotiate on a trade agreement. Once in the stage of signing FTA, the country with more FDI will be able to capture a larger share of the value created by FTA. While it seems true for a large part of history, when countries like Malaysia and Singapore prioritized attracting FDI in its policy making, there are also periods when a more balanced approach is employed. There can be several explanations for such discrepancy between reality and our model prediction. Firstly, a government, in addition to contemplating the future effect of FDI allocation, must also deal with short-term economic fluctuations and political affairs (e.g., Singapore in the 1960s). Secondly, while the model assumes that FDI competition only matters for bargaining power in trade negotiations, FDI-incentivizing policy can pose significant loss to the economy that are outside the scope of this model. This assumption will be relaxed in the following section.

Non-trade Cost of FDI Competition

In the previous analysis, an important assumption is that there is no cost of taking either action in the first-stage game. In reality, however, the cost of pursuing FDI-incentivizing could be substantial to the economy. Furthermore, such cost might not be captured by the gain from trade or FTA, which are assumed to be the only relevant payoffs in the game analyzed. The cost incurred by government to attract FDI can have many aspects. First, introduction of foreign competitors brings about competition to local firms, which are likely of smaller scales, and would likely hamper the growth of these firms. Second, policies like tax breaks create a non-level playground, in which foreign firms have not only the advantage of scale but also favorable treatment promised by the government.

This can further distort the local markets and weaken the host economy. Finally, relying on foreign investments expose countries to excessive economic and financial risks, which stem from the countries that export capital, i.e., the home countries of investors. The 1997 1997 Asian financial crisis perfectly embodies this financial contagion (Allen and Gale, 2000).

Therefore, it might help our analysis to relax this assumption. Consider, for example, the same biform game in which it costs each country (1.01) to choose "Compete" in the first stage. Depending on the scope of the loss to welfare from FDI competition in reality, the value (-1.01) chosen here (just above a quarter of the total gain from FTA) might seem too large or small. Nevertheless, it will be shown such that cost would suffice to change the outcome of the game. Therefore, this can be thought of as an experiment-of-thought or a call for future policy makers to weight the cost of FDI attraction against the gain of trade.

Figure 5 shows the first stage game once the cost to competition policies is incorporated. The payoffs from the second-stage games are also included as before. The game can once again be solved using backward induction. If Malaysia chooses "Compete", Singapore will choose "Not Compete" because $1 > 0.99$. If Malaysia chooses "Not compete", Singapore will choose "Not Compete" because $2 > 1.99$. So, Malaysia will obtain payoff 2 by choosing "Not Compete", which is higher than payoff 1.99 obtained by choosing "Compete". The only (sequential) Nash equilibrium of this game is (Not Compete, Not Compete).

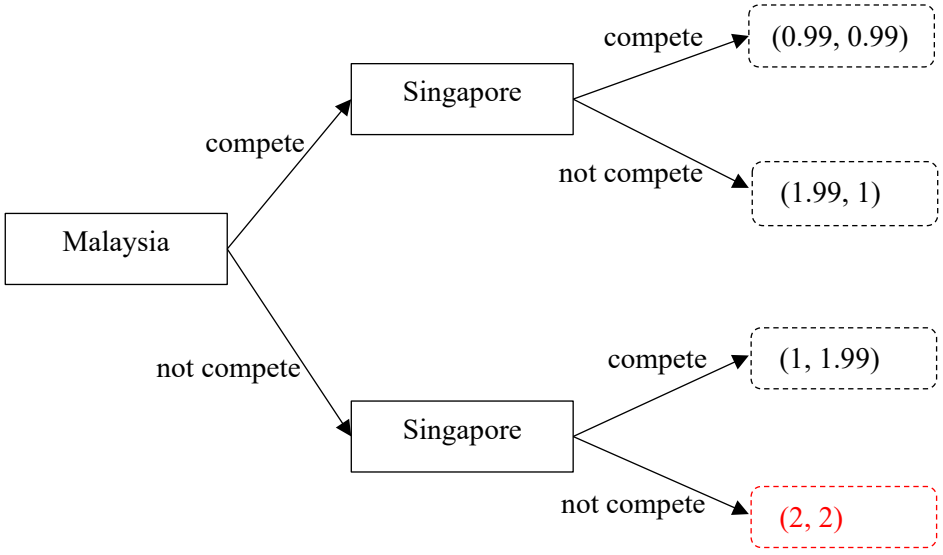

Figure 5. First-stage Game with payoffs derived from second-stage games and cost to "compete".

Now the outcome of the game is opposite to that of one where there is no cost to implementing FDI-incentivizing policies. The intuition is simple: Now that competing for FDI is too costly, a country would rather take a smaller share of the gain from trade. Even when a country (Malaysia) finds it easier to obtain the bargaining power by attracting more FDI because the other (Singapore) is known not choosing to compete, it is still not worth it implement FDI-incentivizing policies. It is also noteworthy that the outcome of this game is the first best in term of efficiency, the and the final allocation is the only Pareto-optimal allocation possible. The lesson from this exercise then perhaps whether or not competing for FDI is optimal depends, for a large part, on how countries perceive their costs of implementing aggressive FDI-attracting policies. When the private cost is large enough, however, countries eventually can realize the best outcome of no (or very little) FDI competition by policy simply by playing the game to their best interest.

5. Conclusion

This research paper delves into the intricate connection between trade and Foreign Direct Investment (FDI) within the context of ASEAN, examining it through the lens of game theory. The paper employs a biform model to shed light on how trade motives can prompt nations to engage in heightened competition for Foreign Direct Investment (FDI), and identifies a condition (i.e., cost of competition) in which policies incentivizing FDI are no longer the best choice.

In the baseline game with no cost to competition, the optimal strategy would invariably be to engage in FDI competition, which means adopting favorable policies to attract foreign investors. The reasoning behind this is that each country aims to accumulate a greater FDI stock before entering the negotiation phase for a trade agreement. When they do reach the Free Trade Agreement (FTA) stage, the country with a higher FDI stock will have the capacity to secure a larger portion of the benefits generated by the FTA.

However, once cost to competition enters the model, countries might refrain from implementing distortive FDI-incentivizing polices, resulting in no competition in equilibrium. Therefore, it is important to identify the perceived cost of FDI competition to policy makers.

Foreign direct investment (FDI) is arguably one of the most important drivers of growth for the developing economies of ASEAN. Nevertheless, to achieve sustainable growth into the future, the government must implement a comprehensive set of policies to not only attract FDI but also improve the fundamentals of the economy. These policies should encompass enhancements in business regulation efficiency, enhancements in public governance and infrastructure quality, and improvements in the accessibility of high-quality human capital, among others (Amador et al, 2021).

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