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Location-based Advantages: Entry of Foreign Firms in the EV Industry in Thailand

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Abstract

Thailand's automotive industry is experiencing a paradigm shift as it deliberately moves toward electrification through its Electric Vehicle Policy (EVP). The structural change has disrupted the competitive dominance of incumbent foreign legacy automakers (FLA). As such, it is compelling them to adjust their developmental strategy while facing strong competition from emerging new entrants. Unlike FLAs that must balance their production and sales between internal combustion engine vehicles (ICEVs) and electric vehicles (EVs), their distinctive advantage is in EV technology. This study examines the motivations of emerging market multinational enterprises' (EMNEs) entry into Thailand, analyzing the case of EV manufacturers from China, to identify the opportunities for FLAs to partake in its goal to produce 30% EVs of its total output by 2030. This research uses various secondary sources from the Bank of Thailand to industry reports, external media reports, and annual reports of BYD and Great Wall Motor between 2014 and 2023. Findings indicate that firm-unique position as global EV leaders and Thailand's location-based advantages contributed to the rapid internationalization of EMNEs from China. At the same time, incumbent FLAs' industry position is weakened by declining sales and a reduced market share. However, some activities in the EV supply chain remain underdeveloped, presenting opportunities for FLAs to leverage their expertise in key areas such as: dedicated research collaborations on battery technology, charging station infrastructure development, workforce skills and development, battery disposal and recycling solutions, and ICEV-EV conversion technology.

Keywords: Strategy; Sustainability; Emerging Markets; Foreign Direct Investment; Electric Vehicle Industry

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Introduction

Vehicle transportation is the biggest contributor of global CO2 emissions, contributing to at least one-third of total transportation emissions (International Energy Agency, 2019). By 2030, more than 60% of emissions are estimated to be from passenger cars and small commercial vehicles (UNCTAD, 2010). Mitigating this emission requires concerted effort from global automakers and country governments to work together to adopt green processes and technology in manufacturing fuel-efficient or EVs (UNCTAD, 2010).

Thailand, one of the founding members of the 10-member states of the Association of Southeast Asian Nations (ASEAN), is the fourth largest country by population and GDP per capita. It is also known as the 'Detroit of Asia,' home to the world's 10th largest automaker (Medina, 2025), the largest car exporter, and the second largest in sales in the Southeast Asian market (Source of Asia, 2024). In 2024, car production reached 1.8 million, and 37% were exported, including the US, China, and Japan (Medina, 2025). The industry is an economic pillar contributing between 10-11% of GDP and creating direct and indirect employment for over 2 million people (Medina, 2025). In terms of inward foreign direct investment (FDI) in ASEAN, it ranked 6th in 2023, amounting to $8 billion (Association of Southeast Asian Nations, 2023).

In recent years, Thailand has transitioned to focus on EVs and instituted EVPs to drive local production and demand, as it did for ICEVs in the 1960s, which led to an inflow of automakers' entry from Japan, Europe, and the US. In response to the EVP, these incumbents increased hybrid EV (HEV) and plug-in hybrid EV (PHEV) to take advantage of the incentives. Operationally, it was less costly as an internal combustion engine (ICE) was still needed in the production process, as opposed to a battery EV (BEV) that requires a reorganization of core material procurement to ensure that battery packs are efficient (Schroder et al., 2021). In 2020, distinctive incentives were targeted at BEV manufacturers and attracted a significant amount of production-facility investment from China (Bharadwaj, 2023).

Evidently, the structural shift in the industry impacted consumers' perception of vehicle purchase as well. For example, Thai consumers' attitude towards Japanese brands has shifted somewhat, as it decreased by 3% in 2024 from 35% in 2023, according to the Thailand Automotive Consumer Survey (Deloitte Thailand, 2024). The survey implies that Japanese legacy automakers (JLA) are lagging in their EV developmental strategy compared to China (Mazzocco & Sebastian, 2023; Wakabayashi & Fu, 2024). Contributing factors were their failure to refurbish or decarbonize their existing supply chain network, increase their research and development (R&D) to cater to a wider range of model variety, develop cost-efficient models in performance and price, and scale their production to reduce the cost per unit. Japanese legacy automakers' declining competitive strengths were reflected by their lagging sales performance relative to Chinese automakers in Japan and Thailand (Johnson, 2025). Obviously, the quicker uptake in EV battery technology and two decades of supportive Chinese governmental policy had accelerated the competitiveness of Chinese EV manufacturers, resulting in a paradigm shift of global dominance (Economist Intelligence Unit, 2024) that used to be shared by the Japanese, European, and American automakers.

Thus, the global springboarding of Chinese EV leadership in the past decade defies the trajectory of the internationalization theory that postulates sequential internationalization stages to reduce risks and uncertainties, analogous to the cost of doing business abroad. Chinese EV manufacturers' rapid expansion into Thailand is reshaping Thai consumers' automobile

choice (Yang, 2024). In real terms, Thai consumers were buying more Chinese EVs than Japanese brands as sales fell significantly from 86% in 2022 to 75% in 2023 (Wakabayashi & Fu, 2024). Elsewhere, in developing economies, Chinese car brands were more popular in India and South Africa (Mazzocco, 2023). This phenomenon implies an increase in EV adoption that is positively responding to Thailand's goal of producing three EVs for every ten vehicles by 2030 in its 30@30 strategy. The rapid speed of internationalization of Chinese EV manufacturers in the "Detroit of Asia" and the delayed response of incumbent brands is a curious phenomenon. Thus, the objective of this study is to examine the internationalization motivations of Chinese EV manufacturers through the lens of the Ownership, Location, Internalization (OLI) eclectic paradigm, specifically on location advantages (Pan, 2003) of Thailand, and firm specific assets (FSAs) or ownership advantages (Dunning, 1979) leading to their rapid internationalization in the EV industry in Thailand. Thus, the research question: "What are the opportunities for foreign incumbents and foreign automakers' expansion into Thailand's EV industry?"

Literature Review

Early IB literature spanned the internationalization process of multinational enterprises (MNEs) originating from developed economies, leading to the internationalization theory (Johnson & Vahlne, 1977), eclectic paradigm (Dunning, 1979), and liability of foreignness (Zaheer, 1995). These studies have their roots in Hymer's (1976) study, relating to the costs of doing business abroad.

The internationalization theory posits that the sequential internationalization process begins with exporting, which enables foreign firms to learn and to be familiarized with the host country's business and social environments (Johanson & Vahlne, 1977) to reduce risks and uncertainties. The resource-based view (RBV) and internalization (I) theories (RBVI) (Buckley & Casson, 1976; Penrose, 1959) contend that firms' core competencies in the form of resources and capabilities are their superior FSAs, which could offset liability of foreignness (LOF) (Zaheer, 1995).

In a similar vein, Dunning (1979) deconstructed the RBVI theories into the OLI eclectic paradigm comprising ownership (O), location (L), and internalization (I) advantages. While O- and I advantages are internal to firms, the L-advantage is inherent in the host country. As such, foreign firms' relocation would benefit from cheaper factors of production, attractive FDI policies, and strategic location, enabling them to reach economies of scale and scope, and to avoid costs of transportation, as well as tariffs and quotas imposed by host governments to discourage imports. To this end, firms in developed economies are traditionally considered to possess FSAs that allow them to internalize operations when venturing abroad (Guillen & Garcia-Canal, 2009).

In the past decade, there has been a growing momentum of international business (IB) research on EMNEs' internationalization trajectory. These studies shed light on their motivations in springboarding their internationalization process and the role of favorable government policy. Motivations such as strategic assets seeking superior organizational capabilities, technology, and innovation, combined with supportive home government policy to encourage outward FDI, accelerated EMNEs' internationalization (Deng, 2009; Luo & Tung, 2007; Marinova et al., 2011).

Another stream of research found that EMNEs have often chosen rapid internationalization over the traditional iterative approach (Johanson & Vahlne, 1977) and have expanded through acquisitions, joint ventures and mergers with consequent high resource commitment (Deng, 2009; Luo et al., 2011; Luo & Tung, 2007; Mathews, 2006; Meyer & Thaijongrak, 2012; Tsai & Eisingerich, 2010). Various research studies the role of the Chinese government in building its domestic firms to reach the state of global competitiveness (Deng, 2009). Luo and Tung (2007) argued that EMNEs can springboard their internationalization because of their government policies that provided preferential treatment, both in financial and non-financial form, to encourage outward FDI. This implies that EMNEs have a financial advantage to increase their resource commitments from the beginning of their international expansion. Findings from Marinova et al.'s (2011) study revealed that home-country specific advantages, related to government-favorable outward FDI policy and strong relational framework between government and corporations, accelerated the internationalization process of Chinese firms. Similar findings from Pan (2003) asserted that home and host-country-specific factors could have influenced the inflow of FDI into China in the early stage of China's industrialization. Another study of 12 Chinese automakers' internationalization patterns found that half of the automakers chose rapid internationalization by opening their first facility abroad (Drauz, 2013).

Indeed, governmental supportive programs impact firm investment strategies as governments increase their effort to stimulate their economies on a path-dependent basis. Continuous sectoral research and development subsidy compensated for EMNEs lacking in FSAs to internationalize. For example, in the solar PV industry, China did not possess the technology to compete with world leaders from the US, Germany, and Japan (Campillo & Foster, 2008). Over the years, it has made remarkable progress to emerge as the top solar PV market in 2013 (European Photovoltaic Industry Association, 2014), accounting for about 70% of solar module production (Platzer, 2015). In the EV industry, strong and consistent government support over time has created home-grown global leaders, just like BYD's global leadership in the BEV market, and CATL in battery technology (Mazzocco, 2023; Wyk, 2023). In Thailand, a corporate tax exemption of up to 8 years, but capped to a maximum limit, was applied to investors in manufacturing any EVs when the Eco-program was implemented in 2007. Incumbent automakers such as Toyota, Honda, Mazda, BMW, and Daimler increased their HEV/PHEV production in Thailand to take advantage of the incentives (Furukawa, 2019; Maikaew, 2018, 2019a, 2019b; BMW, 2018, as cited in Schroder, 2023).

In sum, the evolution of China's global competitiveness is clear, and it no longer holds that EMNEs are traditionally not considered to have possessed any of the traditional OLI advantages compared to Western MNEs (Mathews, 2006). China's success as the global leader in solar panels was a combination of increasing domestic PV capacity installation, governmental support, and worldwide demand that created an environment for Chinese manufacturers to grow and develop their expertise (Liu & Goldstein, 2013). Similarly, China's global EV leadership is the result of two decades of institutional support to strengthen R&D on battery technology, and incentives for production and consumption attest to their rapid internationalization in Thailand.

Research Methodology

This study adopts the theoretical framework from Dunning's OLI eclectic paradigm (1979) to assess Thailand's location-based advantages and FSAs of EMNEs from China to determine their ownership advantages. Taken together, a systematic approach of data analysis began by examining Thailand's inward FDI and trade with important partners/regions, but was limited to C29: Manufacturer of motor vehicles, trailers, and semi-trailers industry from the Bank of Thailand; specific data on EV is not available. The countries that have invested in Thailand are the original manufacturers of vehicles. Trade data was sourced from an external agency, the International Trade Center (ITC). The analysis would elucidate the trend of inward FDI and trade in tandem with the implementation and revision of the EVP.

Second, macro-economic determinants such as the benefits of institutional policy, regional blocs such as Thailand/regional free trade agreements, were included to illustrate the potential of market size to avail location-based advantages. Third, annual reports of BYD and Great Wall Motor (GWM) were reviewed to determine the extent of their FSAs in the form of government grants and subsidies, human resource demographics, research and development (R&D) commitment, and expenditure. Fourth, various industry and media reports were used to assess existing FLAs' developmental strategy pipeline to leverage the EVP and to mitigate competitive threats from emerging new entrants.

The different sets of secondary data were structurally analyzed based on the theoretical framework in Figure 1, and discussed simultaneously, supported by literature to answer the research question: "What are the opportunities for foreign incumbents and foreign automakers' expansion into Thailand's EV industry?"

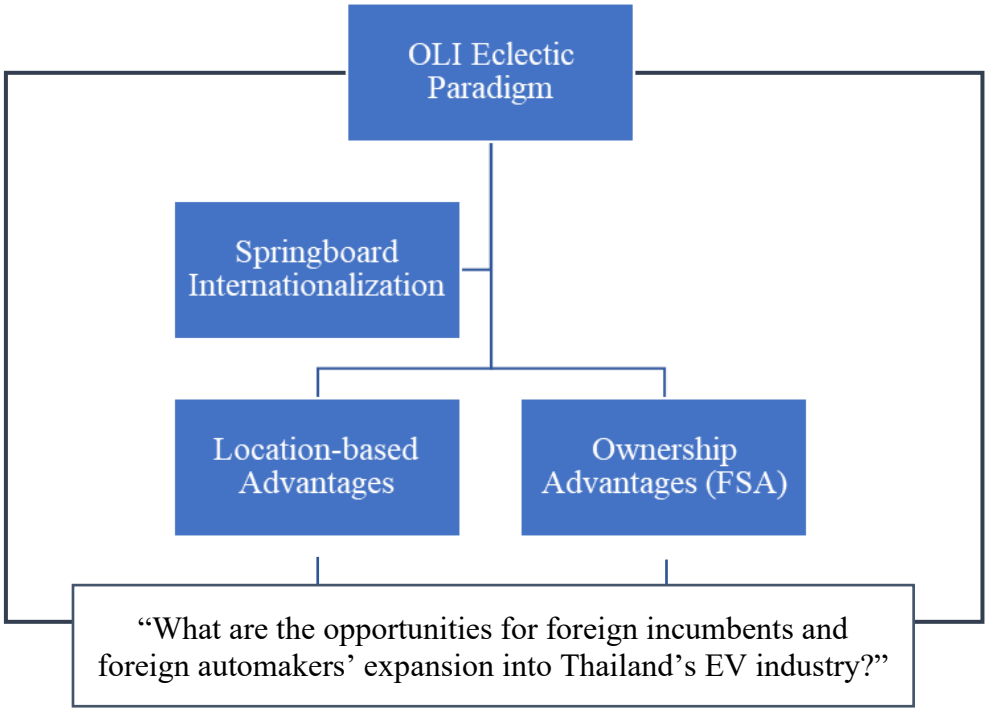

Figure 1: Theoretical Framework for Data Analysis and Discussion

Research Findings and Discussion

Favorable Government EV Incentives

Empirical studies showed that tax incentives had an impact on increased inward FDI (Dang & Nguyen, 2021; Sethi & Judge, 2009). Such incentives require firms to base their business activities in the host country to actualize the location advantages. In the 1960s, Thailand provided FDI incentives to develop its automotive industry, which attracted many FLAs from Japan and Europe (Natsuda & Thoburn, 2011). Foreign direct investment into Thailand between 2015 and 2024 showed China as an emerging investor (Table 1). It is reasonable to assume that their investment in Thailand was mainly passenger EV from 2020 onwards based on various media and industry reports (BloombergNEF 2024; Wakabayashi et. al, 2024). This is also triangulated by the 2024 ASEAN Investment Report, which states that China's investment between 2021 and 2023 was in the manufacturing of EVs and batteries (ASEAN Investment Report, 2024). While investment from the rest of the countries was a combination of ICE MV, EV, trailers, and semi-trailers.

At the beginning stage in 2016, the Thai government announced lower excise taxes on EVs, which were assembled and used batteries and components sourced locally (Tunmuntong, 2017). Interestingly, China's FDI amounted to $85.6 million in the same year. This could be inferred as leveraging the EVP's incentives. Similarly, FDI from Japan increased by more than 2-fold. In 2020, more incentives were offered exclusively for BEV manufacturers in the revised EVP that could have accelerated China's FDI ($231. 6 million) and some FLAs' decisions in Thailand to reduce or stop production in their ICEV plants, such as Subaru at the end of 2024, Suzuki by end of 2025, while Honda and Nissan were going to reduce their production (Yang, 2024).

In 2023, further EV excise reductions from 8% to 2% and import duties from 40% to 20% were introduced for a variety of EVs, batteries, and components (KPMG, 2023). Imports from Germany rose by around 150% and increased by 1.5 times from Japan. In 2024, significant investment from France, Germany, Italy, and China was seen, possibly due to more subsidies provided for imports and the purchase of imported BEVs. In general, the effect on higher FDI could be seen between 2021 and 2024, as 2020 was disrupted by COVID-19.

A closer examination of media reports revealed specific investment commitment by EV manufacturers. For example, between 2020 and 2023, total investment from key Chinese manufacturers stood at approximately $1.44 billion (Ghoshal & Freed, 2023; Sethi & Judge, 2009; Tanakasempipat, 2023). Within the EV component supply chain, the battery cell is the most expensive component of the EV battery packs, amounting to 75% of the total cost. Thus, there is an opportunity to capture this economic value if the value chain activity occurs in host countries (Schroder et al., 2021). Sunwoda Thailand, a Chinese subsidiary, selected Thailand to produce battery cells for regional and international distribution (Drauz, 2013; Nation Thailand, 2025). These massive investments (Table 2) were clearly a threat to the FLAs' slow response to the automotive industry's dynamics (Ghoshal & Kongkunakornkul, 2023), resulting in a reduced market share as the country transits to electrification, welcoming Chinese investors and encouraging consumers' electric car switch.

Table 1: Inward FDI into Thailand in the Manufacturer of Motor Vehicles, Trailers, and Semi-trailers Industry – C29 ($ millions)

Regions/Countries	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
France	39.88	-2.28	2.81	10.29	2.81	11.77	-8.62	16.67	-20.45	230.25
Germany	4.14	2.8	23.19	25.74	12.56	0.94	-4.94	1.35	153.93	249.04
Italy	0.68	1.17	3.35	-2.73	-19.65	25.1	0.38	1.07	1.17	25.78
Japan	317.9	680.8	338.3	955.3	649.9	-910.9	870.7	269.9	435.5	249.0
China	0.0	85.6	114.5	119.2	207.4	231.6	229.1	149.4	-23.3	230.3
United Kingdom	49.0	5.5	3.1	11.2	15.8	1.5	12.3	-23.0	-26.5	0.6
United States	162.0	127.9	-326.7	-60.6	5.4	-209.3	63.9	89.4	65.7	25.8
EV Policy and changes		x				x			x	

Note: Data compiled by the author from the Bank of Thailand between 2015 and 2024 from http://www.bot.or.th/en/statistics/external-sector.html

Table 2: Chinese BEV/HEV Investors in Thailand

Year	Investor	Investment Type	Amount $million
2020	Great Wall	BEV/HEV	650
2022	Nio	R&D	not available
2022	Guoxuan	JV-Batteries	
2023	BYD	BEV	491
2023	Dongfeng Motor	BEV Sports	not available
2023	Great Wall	Batteries	30
2023	Hozon JV	JV- BEV	not available
2023	GAC	Committed to BEV	not available
2023	SAIC	BEV	15
2023	Changan	BEV/HEV	285
2023	SVOLT	JV-Batteries	30
2023	CATL	JV-Batteries	104

Note: Data compiled by the author from ASEAN Investment Reports between 2023 and 2024 from https://asean.org/wp-content/uploads/2023/12/AIR-Special-2023.pdf and https://asean.org/wp-content/uploads/2024/10/AIR2024-3.pdf

This phenomenon is evidenced by the share of HEV and BEV imports from the FLAs vis-à-vis China (Figures 2 and 3). China was the leading BEV import partner with a significant increase in 2023. Although there was a drop in 2024, the total imports stood at $1.5 billion, more than the combined amount of the other trading partners ($295 million). As for HEV, Germany took the lead, and China's share was minuscule, validating their specialization in BEV.

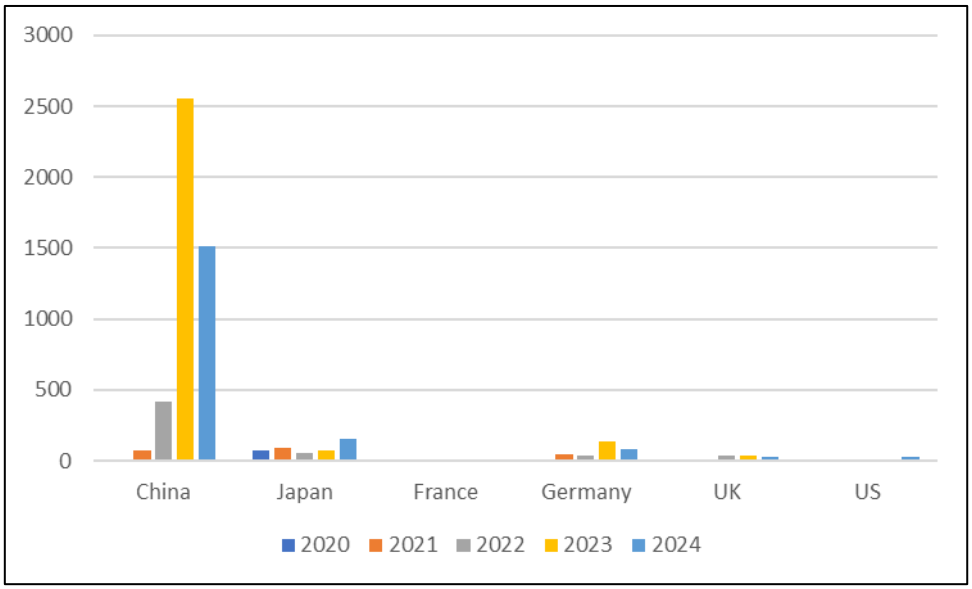

Figure 2: Thailand BEV Imports ($ million)

Note: Data compiled by the author from the International Trade Center between 2020 and 2024. https://www. trademap.org/Index.aspx

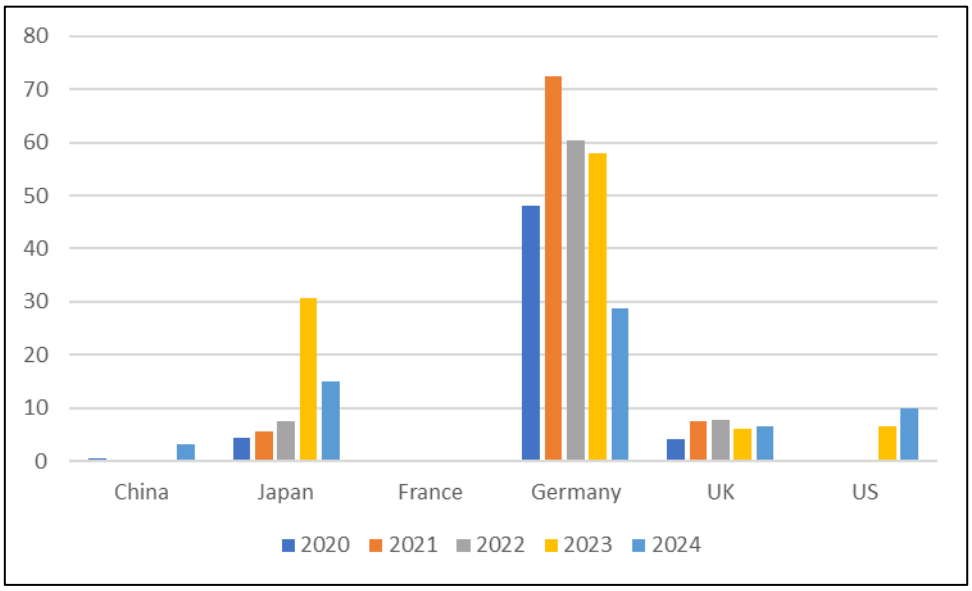

Figure 3: Thailand HEV Imports ($ million)

Note: Data compiled by the author from the International Trade Center between 2020 and 2024. https://www. trademap.org/Index.aspx

In sum, the upward trend of FDI and imports, especially from China, Japan, and Germany, suggests some degree of success of the EVP policy (Schroder, 2023). Although the investment and trade flows from France, Germany, and Italy were relatively lower than those from China, new entrants and incumbents would be able to trade with Thailand with a minimal tariff structure after 2025, based on the Thailand-EU free trade agreement. Thus, Thailand's location-based advantage is heightened by ease of market access and increased product competitiveness. In particular, vehicle trade is a key pillar of Thailand-EU commerce, with imports from the EU ranking second and exports to the EU ranking third. (Medina, 2024).

Access to an Integrated ASEAN Market

The ten-member states of ASEAN are diverse in human capital and natural resources, with a population of over 650 million people, greater than the EU and the US. Indonesia has the world's largest deposits of nickel necessary for battery production (PwC, 2025), and Thailand imports and exports more than 95% of its components from Malaysia and Vietnam, respectively (Schroder et al., 2021). Thailand's EV exports to Singapore, Laos, and Cambodia rose by 300% in 2023 (Seth, 2025). This illustrates the ease of access to important minerals and components within ASEAN, enhancing logistics fluidity. In addition, ASEAN is poised to become the hub for battery and part manufacturing (Economist Intelligence Unit, 2024).

The ASEAN region continues to attract substantive FDI (Dang & Nguyen, 2021), making it the top FDI recipient for 3 consecutive years between 2021 and 2023. The region is host to more than 80% of Global Fortune 500 companies, and more than 5000 multi-national enterprises (MNEs) regional headquarters, which own regional supply chain networks across the region's export industries (AIR, 2024). This attests to the importance of the ASEAN market. Investment trends in recent years have pivoted on renewable energy, electric vehicles, and the digital economy, providing more opportunities for MNEs to provide services such as EV battery disposal and recycling solutions, ICEV-EV technology conversion of old ICEVs, and entering the ride-hailing services. As more transportation modes are electrified, it would lead to decreasing carbon emissions and enhancing the well-being of people.

As part of ASEAN, Thailand benefits from ASEAN's regional cooperation efforts, including the adoption of the Declaration on Developing a Regional Electric Vehicle Ecosystem. Cohorts of EV, battery manufacturers, ride-hailing, commuter, and delivery services, and oil and gas companies are in Indonesia, Malaysia, and Vietnam, further strengthening the EV supply chain network (AIR, 2023). The climate of renewable energy investment in ASEAN is more positive than in developed and developing countries in terms of tax and financial incentives and feed-in tariffs (AIR, 2023), which could further incentivize FLA's investment into Thailand and the ASEAN.

Remarkably, the largest regional FTA in the world resides in ASEAN, which reaffirms Thailand's location-based advantage: The Regional Comprehensive Economic Partnership (RCEP) comprises 15 economies that constitute 31% of the world's GDP and 28% of global trade (Sutherland, 2022). When advanced economies are slowing down, Asia offers the engine of growth. Apart from being the largest FTA, the RCEP is expected to strengthen economic links and boost the supply chain efficacy in Asia through cost-efficiency (Sutherland, 2022). Thus, it increases the comparative and competitive advantage of ASEAN. As part of ASEAN, foreign investors in Thailand can leverage the ASEAN free trade agreements for their market expansion.

In sum, the favorable investment environment converges to trade liberalization mechanisms such as exerting national treatment for all member-state investors, transparency in investment laws and regulations, investor protection measures, free of performance requirements such as local content requirements (LCR) is the result of the region's commitment toward FDI that focuses on regional integration, resilience and sustainability to facilitate FDI, economic growth and development. Thus, investing in Thailand would grant foreign investors immediate access to the ASEAN market, the fastest-growing region in the world. However, there are threats from other manufacturing ASEAN countries, such as Indonesia, Malaysia, the Philippines, and Vietnam, which have an ambition to reach their EV and battery manufacturing targets by 2030 (PwC, 2025). Currently, Thailand is leading, but it is a close race as Indonesia, Malaysia, and Vietnam are close competitors that may erode Thailand's competitive position (Tham, 2022). For example, Indonesia has a natural resource advantage, as mentioned earlier. As a result, Thailand must be vigilant in monitoring its EVP and adjust its strategy accordingly.

Thailand Free Trade Agreement (FTA) with the World

The impact of free trade agreements on the flow of FDI of developed and developing economies is widely studied by scholars. Bae and Jang's (2013) study found a positive relationship between FTA and the flow of FDI into and out of South Korea. Banga's (2006) study analyzed the FTAs of 15 Asian developing economies and found that bilateral FTAs with developed economies led to an increase in FDI inflows. To this end, Thailand has three bilateral FTAs with significant developed economies such as Australia, New Zealand, and Japan, and one bilateral FTA with the second-largest economy in the world, China. In 2024, China, Japan, and Australia were Thailand's top vehicle export destinations (Medina, 2025), supporting studies of Bae and Jang (2013) and Banga (2006). Foreign investors could leverage all of Thailand's and ASEAN's bilateral FTAs, especially with the two largest economies in the world, China and India, and the FTA in services.

Another significant FTA that would impact trade and investment flow into Thailand is the Thailand-EU FTA (TEUFTA), which is expected to be finalized by the end of 2025 (Medina, 2024). The European Union (EU), the biggest trading bloc in the world, has a market size of over 400 million people, is Thailand's 5th largest trading partner and investor (ASEANstats Report, 2024). The TEUFTA will reduce the tariff of EV exports to below 12%. Thus, TEUFTAs would increase Thailand's competitive environment and heighten its location-based advantage as the government continues its effort to increase its global labor competitiveness in knowledge and skills to meet the stringent standards of the EU.

Global Automotive Experience and Skilled Workforce

Thailand's institutional environment and the automotive industry have co-evolved collectively, resulting in a skillful and competitive workforce (Intarakumnerd, 2021). In mid-1998, Thailand Automotive Institute (TAI) was established as an interlocuter between the government and private enterprises that provided both consultancy, testing, and calibration services to firms. Currently, research collaborations include: TAI and Korea Conformity Laboratories (KCL) establishing battery testing center to advance R&D in battery research and development, Electrical Vehicle Association of Thailand (EVAT) and 11 private companies are collaborating in R&D in electric charging consortium to promote EV usage in Thailand and ASEAN, Automative and Tyre Testing and Research and Innovation Center have testing laboratory to develop human competencies in the EV transition, study and research in EV technology underpins the project-collaboration between Thammasat University, Kasetsart University, public and private sectors.

The current workforce needs to be reskilled through localization of R&D activities (Intarakumnerd, 2021) that tend to converge toward facility modernization (Barnes et. al., 2017). The FLAs are considered to be advanced in their EV technological knowledge; thus, there are opportunities to institute workforce training and development. For example, established European EV brands known for higher performance and efficiency EVs in battery and distance power, such as Mercedes-Benz and BMW, are sharing their knowledge to help Thailand achieve its EV goals. In an interview with the CEO of Thailand Mercedes-Benz Manufacturing, Mr. Axel Dense specifically asserted that "*We are working with the government on ways to support the market, including the transfer of technology, employee skills, charging infrastructure, and battery testing facilities."* In the opening ceremony of BMW's exclusive high-voltage battery production facility in 2025, the head of Mr. Milan Nedelikovic affirmed, *"once again, the principle of 'local for local' applies, supporting economic development, employment opportunities, and knowledge transfer in Thailand and the Asean region"* (Williams, 2024).

In sum, the experience of the workforce is harnessed through training and development as well as R&D collaborations with specialized institutions and economic actors. Although there are concerns about the transition to electrification being challenged by a skill gap in terms of readiness of Thai workers to meet the production and sale of EVs (International Labor Organization, 2024), various investments in battery production facilities demonstrate collaboration opportunities for foreign automakers to transfer their knowledge to rebuild local workforce competency (Thailand Board of Investment, n.d.).The world's EV market is expected to reach 115 million units in 2029 (EIU, 2024). Thailand's strategic location for the production and distribution of EVs and batteries would be strengthened by its inward learning. As a result, it could compete with other manufacturing giants such as Indonesia, Malaysia, and Vietnam.

Chinese EV Manufacturers: Firm-Level Advantages

Chinese EV manufacturers' ownership of firm-level advantages was a concerted effort by the Chinese and local governments providing EV R&D subsidies (Deng, 2009; Liu & Goldstein, 2013; Luo & Tung, 2007). This assertion tends to apply to the rapid internationalization of EMNEs in Thailand based on FSAs and growth trajectory elucidated in BYD and GWM's annual reports.

Accordingly, both share a similar R&D investment strategy by investing substantially in R&D centers, employed fresh young graduates, engaged in research collaboration with top universities and have over many global R&D institutes strategically located in important economies such as Germany, the United States, Japan, India, Austria and South Korea (Dong, 2024; Great Wall Motor Company Limited, 2022). Taken together, these activities could be substantiated by the high R&D investment that showed a year-on-year increase (Table 3). In terms of EV patent-filing that is related to R&D, BYD applied an average of 32 patents per day (Dong, 2024), while GWM averaged about 13, indicating the strength of their FSAs in EV technology. On a global scale, BYD's patent filing in the past 2 decades exceeded Tesla by 16-fold (Shimizu, 2023). This phenomenon of EMNEs leading in EV technology is contrary to the assertion that they do not possess traditional FSAs (Dunning, 1979).

Table 3: Research and Development $millions

Chinese Firms	Total	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
GWM	7,901	1,516	1,673	1,246	707	584	544	462	437	379	353
BYD	13,058	5,435	2,562	1,099	1,025	769	687	514	435	275	257

Note: Data compiled by the author from BYD Company Limited and Great Wall Motor Company Limited annual reports between 2014 and 2023

Table 4: Government Grant and Subsidies $ millions

Chinese Firms	Total	2023	2022	2021	2020	2019	2018	2017	2016	2015	2014
GWM	1307	279	249	302	174	84	44	60	18	47	50
BYD	2425	635	230	311	232	235	320	175	98	80	110

Note: Data compiled by the author from BYD Company Limited and Great Wall Motor Company Limited annual reports between 2014 and 2023

The above shows the impact of the Chinese government grant and subsidies that enabled Chinese EV manufacturers to possess unique assets of technological proprietary (Liu & Goldstein, 2013) derived from a pool of qualified engineers and researchers. Thus, accelerated their expansion outside China and became world leaders. In 2021, Chinese registered HEV and BEV exceeded European registrations by 3 fold at 3.3 million units (International Energy Agency, 2022). In their home market, foreign legacy automakers are partnering with them to leverage their EVs' strategic assets. Volkswagen acquired a small stake in the Chinese EV start-up Xpeng to leverage its EV technological know-how, and it is the largest shareholder of Chinese battery manufacturer Gotion. Ford US and Chinese CATL are in partnership to produce batteries using CATL technology (Mazzocco & Sebastian, 2023). This switching role of Western firms strategically seeking Chinese EV technology illustrates the ownership advantages (firm-level) in the form of technological excellence through strong Chinese governmental support (Liu & Goldstein, 2013). Thus, illustrating the superiority of EMNEs' FSAs relative to Western MNEs (Mathews, 2006).

Foreign Legacy Automakers' Transition

Thailand has been JLA's second-home base for their ICEV production and exportation within the Asia region. However, they have been slow in their uptake of EVs in their home market (Randall, 2024) and abroad. This is reflected in the assertion of the Senior Vice President of Thai Summit Group that Japanese automakers would have between 4 and 8 years to align their competitiveness against the insurgent competition from Chinese EV manufacturers (Admin, 2024), which are offering a wide variety of affordable EVs (Ghoshal & Kongkunakornkul, 2023). Japanese legacy automakers were either streamlining their production activities (Yang, 2024) or increasing their EV investment in Thailand. (Take & Shiga, 2024). Four major Japanese automakers were reported to invest up to $4 billion in EV production for the next 5 years (Royal Thai Embassy, 2024) as a result of the EVP.

On the other hand, German automaker Mercedes-Benz entered Thailand in 1979 and started marketing PHEVs in 2016. The significance of Thailand as a location advantage is illustrated in the automaker's choice to launch its fully electric vehicle in 2022, making Thailand one of the only 7 locations in the world to produce high-performance lithium-ion batteries (TBOI, n.d.). Most importantly, not only would the value creation remain in Thailand, but it would also increase its workforce's skills and know-how within the supply chain network. The automaker is well-connected to Thailand's institutions, providing EV support such as a longer-term commitment and contract with a local partner to produce EVs, and furthering local research capabilities by donating a lithium-ion battery cell unit to the National Science and Technology Development Agency (NSTDA) (Nation Thailand, 2024). Thailand's location advantage is prevalent in the action of BMW by selecting Thailand as its first-choice country in ASEAN to have an EV battery production facility, to compete with Chinese EV automakers (Apisitniran, 2024).

Foreign legacy automakers could take advantage of the results of the consumer survey (Deloitte Thailand, 2024) to adjust their EV developmental strategy geared toward competitive pricing. The survey revealed that price is the major consideration (sentiment increased by 161% from 2023 to 2024) in their next car purchase. The second consideration is their increasing concerns for the environment. Thus, implying the significance of creating more BEVs and reducing HEV models, as BEVs emit less carbon and receive more tax incentives. Automakers

from the US and Europe in Thailand are fewer relative to China (Mazzocco & Sebastian, 2023). Thus, this is an opportunity for FLAs to enter Thailand, especially for those who have been using China as an exporting country; Thailand offers an alternative for them to diversify their manufacturing bases.

Complementing the EV consumer industry is the ride-hailing industry that offers opportunities to decarbonize the fleet of three-wheeler (tuk tuk), motor vehicles, and motorcycles. Downstream supply chain investment opportunities are the need to increase the number of public and private charging stations (TBOI, n.d.); to provide avenues of disposal of batteries and vehicles (Grutter & Kim, 2019), where firms from the EU and the US own superior waste management technology.

In sum, Chinese EV manufacturers were competitive due to their low pricing and battery efficacy. However, FLAs are not lacking in their know-how. For example, in terms of the leading brand of patent ownership in EV technology between 2002 and 2022, Toyota held first place. Three out of the top 5 rankings were Japanese, and American Ford ranked 4th (GlobalData, 2022). Although it would take considerable time for ICEVs to be replaced, FLAs have to be cognizant of their pricing strategy between their ICEV and EV models on the one hand, and their EV price must be equally or more competitive than Chinese EV models on the other. As a result, FLAs have to balance their economic value creation between these two levers that are exerting cost and value pressure on the FLAs relative to Chinese EV brands, which focus on delivering their value exclusively on EV models.

Theoretical Contributions

My study reveals the emerging strengths of the O-advantage possessed by EMNEs that were traditionally not known to own firm-specific assets such as brand reputation, technological know-how, and managerial skills based on the OLI theory (Dunning, 1979). My study contributes to the literature of EMNEs' rapid internationalization in several ways. First, EMNEs' rapid internationalization stems from their FSA that could be internalized to capture the location-based advantages in Thailand. Second, home- and host-country government policies are a critical engine to foster development of strategic assets of home-grown MNEs on the one hand, and attract inward FDI into the host country, on the other. Third, Western MNEs are seeking EMNEs for partnership or acquisition to leverage their battery technological know-how. Fourth, it reinforces the role of government policy toward economic development.

Conclusions

Thailand's transition to EV aligns with the broader United Nations Sustainable Development Goal 7: *"Ensure access to affordable, reliable, sustainable and modern energy for all"* (United Nations, 2023). Thailand's energy consumption from road transport based on vehicles on the road is estimated to be the highest among the manufacturing economies of ASEAN, reaching over 2 million vehicles by 2050 (Crawford, 2024). Against this backdrop, it is clear that the decarbonization process is long-term, and it will provide opportunities for FLAs and other foreign investors to partake in the process to help Thailand's transition.

This study elucidates the dominance of EMNEs, using the case of EV manufacturers from China, which leapfrog their internationalization into Thailand, examined through the theoretical framework of Dunning's OLI eclectic paradigm with a focus on ownership and

location advantage. Location-based advantages such as favorable government EV incentives, immediate access to an integrated ASEAN market, free trade agreements, global automotive experience, skilled workforce, knowledge-based assets in terms of ongoing research collaborations in EV technology, and ownership advantages such as government grants and subsidies, R&D capabilities, and superior battery technology were the drivers of their rapid internationalization.

Some success indicators of EMNEs' entry into Thailand could be inferred from the performance of FLAs, such as reduced market share, and revamping their developmental strategy either through reduction or cessation of ICEV production and increased investment in EV facilities across Thailand. However, there are opportunities for both foreign and incumbent automakers to expand in Thailand and help build their EV supply chain through local production of EV and EV parts partnerships, training and development for skills transfer, research collaborations on battery technology, charging station equipment, battery disposal and recycling, ICEV conversion to EV, etc. FLAs have expertise in these areas, and they are currently underdeveloped, as little attention has been paid to battery disposal and recycling since EV production and sales are beginning to gain traction (Tham, 2022). Thai policymakers could provide a pathway for FLAs to contribute economically in this segment to prepare for the future and to protect the ecological environment. In furtherance, policymakers should strategize ways to handle the vast stock of ICEVs between 20 and 30 years old, as old ICEVs pollute more than an EV. The opportunity for FLAs is that the ICEV conversion to EV is a niche segment since Thailand has no legislation on a car’s lifespan (Hammasiriroj et al., 2025).

In sum, China’s leading technological prowess in battery technology fuels its product efficacy in performance and price. These are the two important levers that sustain their increasing global market share. Although the leading brands of the three large economies (Japan, the EU, and the US) are lagging behind China in EV production and sales, Thailand is a springboard of opportunities to ascend to the Chinese competition, as mentioned above.

Finally, Thailand’s competitive advantage relative to other member-states of the ASEAN resides in its manufacturing prowess and constant calibration of its EVP on the supply and demand sides. However, policymakers have to stay vigilant with the EV development in competitors’ markets in Indonesia, Malaysia, and Vietnam. Currently, on average, Thailand is leading in production and sales through its cash subsidies on passenger EVs (EIU, 2024). Indonesia and Vietnam have a natural resource advantage for EV battery production (Tham, 2022) that could lower the cost of production and increase the speed of delivery. Thus, a stronger EV supply chain network.

Limitations and Directions of Future Research

This research is limited to examining the location advantages of Thailand in the EV industry. Future research could examine other countries in the ASEAN region to compare and contrast the location-based advantages to generalize my findings. Specifically, studies could be made on Indonesia, Malaysia, and Vietnam as possible locations for foreign EV firms to enter the ASEAN market.

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