Kasetsart Journal of Social Sciences 44 (2023) 377–386

Kasetsart Journal of Social Sciences

journal homepage: http://kjss.kasetsart.org

The economic impact of special economic zones: Evidence from Thailand

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Article Info

Article history:
Received 2 May 2022
Revised 27 June 2022
Accepted 31 July 2022
Available online 21 June 2023

Keywords:
foreign direct investment,
special economic zone,
Thailand

Abstract

This paper examines Thailand's establishment of Special Economic Zones (SEZs) on the local economy. The analysis is based on a panel data set covering 77 provinces over the period 2012–2020. Comparing the changes between the provinces that created a SEZ and those outside the zones, it was found that the SEZ program has not attracted significant levels of foreign investment into the zones. Difference-in-difference estimation is used to assess the difference in real gross provincial product per capita and poverty rate between SEZs and non-SEZs. The main results show that after implementing the SEZ policy in 2015, the provinces that established a SEZ do not achieve a significantly higher rate of economic growth compared to those outside the SEZs. In addition, progress in poverty reduction in SEZs is not better than that in non-SEZs. The results are consistent when estimating the model using a system GMM estimator to address endogeneity issue. These results point towards a lack of a favorable investment environment in the zones and fiscal incentives offered by the SEZ program as a driving factor behind the null effects.

Introduction

The past few decades have witnessed a massive proliferation of special economic zones (SEZs), especially in Asia and Africa. SEZs are also known as Free Trade Zones (FTZs) and Export Processing Zones (EPZs). The number of SEZs has increased from less than 100 in 1975 to more than 5,000 SEZs today, more than 1,000 of which were established in the last five years (United Nations Conference on Trade and Development [UNCTAD], 2019). This phenomenon has coincided with a notable increase of the engagement of developing countries in the world economy. Despite a large body of research on the impacts of the spatially targeted programs (Aggarwal, 2022; Ambroziak & Hartwell, 2018; Greenstone et al., 2010; Moberg, 2015), there is a lack of empirical evidence on the SEZ program, with an emphasis on the role of SEZs in the current feature of economic globalization.

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https://doi.org/10.34044/j.kjss.2023.44.2.07
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A favorable investment environment and upgraded infrastructure in the SEZ can help developing countries integrate into the world economy (Aggarwal, 2007; Ge, 1999; Lu et al., 2019; Warr & Menon, 2016; Zeng, 2015). Numerous studies suggest that a SEZ makes a significant contribution to the expansion of the production of manufactured goods (Abeywardene et al., 1994; Athukorala & Narayanan, 2018). SEZs also result in export growth and employment creation (Farole & Akinci, 2011; Wang, 2013; Zheng, 2021). However, SEZs can have some negative effects on society and the environment (Akinci & Crittle, 2008; Liu et al., 2007; Parwez & Sen, 2016). Examples are labor standards and poor employment conditions (Cross, 2009; Ngai, 2004; International Labour Organization [ILO], 2017). Few studies find that free trade zones do not contribute to the economy (Rothenberg et al., 2017; Wicaksono et al., 2019). By reviewing special economic zones in Indonesia, Malaysia, and Thailand, Aggarwal (2022) describes that the linkages between SEZs and economic growth are weak and underscores the need to incorpoate regional integration into the framework. Yiming and Lei (2020) studied the Shenzen Sepcial Economic Zone in China and found that its impact on poverty is limited because of a declining number of labor-intensive FDI industries. The effects of SEZs are inconclusive since several factors (e.g., size, proximity to a large market, business environment, and the incentives for local politicians) play an important role in the success of SEZs (Alkon, 2018; Farole, 2011; Frick et al., 2019; Zeng, 2015).

This paper examines the impact of Thailand's SEZs established in 2015, with a focus on provincial economic growth and poverty incidence. The analysis is based on the Thai province-level panel data from 2012 to 2020. The available data reveal that SEZs did not attract significant level of foreign direct investment into the zones. The estimation results from the difference-in-difference (DID) approach show that after the SEZ policy was implemented, real output per capita in SEZs does not grow at a faster rate compared to those outside the zones. The conclusions remain robust after controlling for predetermined province-level characteristics and treatment trend. It was also seen that the provinces that create a SEZ do not experience a faster progress in poverty reduction than those outside the zones, suggesting that there is no additional improvement in the quality of life of people living in the zones over and above the improvement seen by people living in non-SEZs. The estimation results from a system GMM are consistent with previous findings. The underlying reason for this is possibly due to a lack of favorable investment environment in the zones.

The findings from this paper contribute to a broad literature on trade and economic development. While a lot of literature has examined the impact of SEZs by employing descriptive analyses and case studies of selected SEZs in Thailand (Fongissara, 2019; Tangtipongkul et al., 2021; Thamwicha & Chaiprasit, 2017), this paper is the first to provide empirical evidence on the impacts of Thailand's SEZs on the local economy using several econometrics techniques. The next section describes the establishment of Thailand's SEZs.

Special Economic Zones in Thailand

Thailand established ten special economic zones along the border regions of the country in 2015 (Table 1). SEZs are divided into two phases: the first phrase covering the provinces of Tak, Mukdahan, Sakaeo, Trat, and Songkhla started in 2015, and the second phrase covering the provinces of Chiang Rai, Nong Khai, Nakhon Phanom, Kanchanaburi, and Narathiwat started in 2016. SEZs have a total area of 6,221 square kilometers. The largest SEZ in terms of total area is the Chiang Rai SEZ, followed by the Tak SEZ and the Nakhon Phanom SEZ.

The SEZ policy aims to create prosperity and to improve the quality of life of people living in the zones (Office of the National Economic and Social Development [NESDC], 2022). The zones are also created to serve as a gateway connecting with the neighboring countries. Stated-owned land and pilot development areas are designated for rental and development in all SEZs. Land rental rates and fees are set differently in each zone. The government also set up a "one-stop service center" (OSS) to facilitate investors and workers.

A firm wishing to locate in SEZs must submit an investment project application to the Board of Investment (BOI). The submission period was between 1 January 2015 and 30 December 2022. There are two cases for a firm to receive fiscal incentives: (1) 13 groups of targeted activities designed by the National Committee on the Development of SEZ; and (2) general activities under the BOI announcement No. 2/2557. Businesses in the 13 targeted industries receive higher fiscal incentives from the BOI. Each zone has different targeted activities depending on local competencies, limitation and demands. Recent available data show that 65 projects in 10 SEZs have been approved by the BOI, with a total investment of about 13,000 million baht. Of the 65 projects, 27 invested in the Tak SEZ. The Tak SEZ also had the highest number of new business registrations between 2015 and 2022. In the next section, the role of SEZs in Thailand's trade and development policy is explained.

Table 1 SEZs in Thailand

Phrase	Zones	Regions	Areas (sq. km.)	Investment supported by the Board of Investment		Business Registration	
				Investment (million Baht)	Number of projects[a]	Registered capital (million baht)	Number of new business registration[b]
Phase 1 (Started in 2015)	Tak	West	1,419	2,634	27	2,679	1,302
	Mukdahan	Northeast	579	392	3	1,446	762
	Sakaeo	East	332	1,881	6	331	154
	Trat	East	50	287	2	124	79
	Songkhla	South	552	4,686	11	1,134	346
Phrase 2 (Started in 2016)	Chiang Rai	North	1,524	136	5	1,962	1,210
	Nong Khai	Northeast	474	1,990	4	1,597	911
	Nakhon Phanom	Northeast	795	15	1	1,015	546
	Kanchanaburi	West	261	727	4	193	114
	Narathiwat	South	235	152	2	361	212
Total			6,221	12,900	65	10,842	5,636

Note: a The number of projects that have been approved for investment promotion from the Board of Investment and started investment between 2015 and 2022. b Total number of companies registered for business establishment in 10 SEZs between 2015 and 2022.
Source: NESDC (2022)

The Role of SEZs within the Trade and Development Policy of Thailand

Thailand's special economic zone policy is an attempt of the Government of Thailand to pursue the so-called "industrial policy"—that is, a non-neutral inter-industry incentive covering a wide set of policy tools—to promote economic growth and innovation, aimed to transform the economy to a high value-added, knowledge-based economy. This keen attempt can be seen from a series of policy initiatives such as the Thailand 4.0 policy and the Eastern Economic Corridor [EEC].

The current promotion of targeted industries in 10 border provinces seems to be inconsistent with the objective of achieving economic development through an export-oriented development strategy. Over the past few decades, "global production sharing" (GPS)—cross-border dispersion of production processes within vertically integrated global industries—has been the defining chateractistics of Thailand's trade. This phenomenon is driven by rapid advancement in production technology, reduction in communication and transportation cost, and trade liberalization reform. Investment incentives provided by the government do not necessarily increase the relative cost advantage of producing or assembling a given part, which is the essence of GPS, in the supply chain.

SEZs are still relatively small in terms of investment, compared with total investment made in the rest of the country (outside the zones). Table 2 reports the number of applications submitted to the BOI for the special incentive scheme for the SEZs from 2015 to 2020. During this period, the number of applications for the SEZs accounted for less than one percent of total applications. The data from the Board of Investment (BOI, 2022) reveal that the Eastern Economic Corridor, an area-based development initiative located in three provinces in eastern Thailand, attracted investment applications worth a combined 209 billion baht in 2020, accounting for about 40 percent of the total value of investment applications submitted to the BOI (481.15 billion baht).

It is important to note that since the SEZs in Thailand were established in 2015, some mega projects (e.g., infrastructure, industrial estate, and customs) have been implemented. While some important infrastructure and customs offices in different SEZs have been finished since 2019, some development projects are planned to be completed by 2023 (Board of Investment [BOI], 2022). This would help attract more foreign investors to the zones. In the section, the model used to formally investigate the effects of SEZs on the economy is presented.

Table 2 Number of applications submitted to the BOI for the SEZs

Year	Applications submitted for the SEZs		Total applications	Total investment (Billion Baht)
	No. of project	Total investment (Billion Baht)		
2015	7	0.36	983	197.58
	(0.71)	(0.18)		
2016	32	7.97	1,455	524.34
	(2.20)	(1.52)		
2017	8	0.36	1,547	610.51
	(0.52)	(0.06)		
2018	8	0.8	1,490	483.81
	(0.54)	(0.17)		
2019	10	2.35	1,523	691.39
	(0.66)	(0.34)		
2020	17	12.34	1,717	481.15
	(0.99)	(2.56)		

Note: The percentage of the application under SEZs to total applications is in parenthesis.
Source: Board of Investment (2022)

Methodology

The Model

The empirical strategy focuses on comparing SEZs and non-SEZs before and after the establishment of SEZs in 2015. This comparison is possible, thanks to availability of data at the province level. The paper utilized a panel data set before and after the establishment of SEZs, covering 77 provinces over the period 2012–2020. In this paper, the focus was on two outcomes: real gross provincial product (GPP) per capita and poverty rate(POV). With two groups and two time periods, the present study followed the difference-in-difference (DID) literature and estimated the following equation at the province level (Equation (1)):

$$GPP_{it}=\alpha+\beta POST_{it}+\gamma SEZ_{it}+\delta(POST_{it}\cdot SEZ_{it})+X'_{it}\varphi+\mu_i+v_t+\varepsilon_{it} \quad (1)$$

where *GPP* is real gross provincial product per capita (in log form), the subscripts *i* and *t* refer to province and year, respectively. α is the constant term, β is the time trend, δ is the treatment effect, and ε_{it} is the random error term. $POST_{it}$ is a dummy variable indicating that GPP_{it} is observed in the post-treatment period (from 2015 to 2020) and 0 otherwise. SEZ_{it} is a dummy variable that takes on the value of one if a province establishes SEZ after 2015. $POST_{it} \cdot SEZ_{it}$ is an interaction term which denotes whether province *i* established a SEZ in year *t*; if province *i* established a SEZ in year *t*, its value is 1; otherwise, its value is 0. μ_i denotes the province fixed effect, controlling for the province-level characteristics that do not change with time but may affect the dependent variable; and v_t denotes the year fixed effect, controlling for the common shocks affecting all provinces in a year. X'_{it} is a set of control variables that may affect the decision-making process for the establishment of SEZs. These predetermined province-level characteristics (X'_{it}) are the initial economic development level (IGPP), workforce (LABOR), and manufacturing output share (MFG). IGPP is log of per capita gross provincial product in 2012. LABOR is log of formal and informal worker. MFG is proportion of manufacturing output in gross provincial product.

In addition, the effect of the SEZs on province-level poverty rates was investigated. Poverty rate is the percentage of the total population whose incomes fall below a provincial poverty line. The estimating equation used in the empirical analysis is shown in Equation (2).

$$POV_{it}=\alpha+\beta POST_{it}+\gamma SEZ_{it}+\delta(POST_{it}\cdot SEZ_{it})+X'_{it}\varphi+\mu_i+v_t+\varepsilon_{it} \quad (2)$$

where *POV* is poverty rate (in log form). Following the literature on poverty (Dollar & Kraay, 2002), Equation (2) includes (log of) real gross provincial product (GPP) as a control variable.

Data

The model is estimated based on a panel data set covering 77 provinces between 2012 and 2020. Gross provincial product (GPP) per capita is measured in real term (Chain volumes measures, reference year = 2002). The data on GPP are taken from the Office of the National Economic and Social Development Council (NESDC, 2022). The data on the labor force (LABOR) come from the National Statistical Office of Thailand (NSO), the

Ministry of Digital Economy and Society (MDES). The number of total workers includes both formal and informal employment. The data on manufacturing output share (MFG), initial GPP (IGPP), and poverty rate (POV) are obtained from the NESDC. Table 3 presents the summary statistics.

Estimation Method and Identifying Assumption

This paper uses the difference-in-difference (DID) approach to investigate the impact of the SEZs on real gross provincial product per capita and poverty. The key identifying assumptions for the DID approach is that the treatment group and control group should follow the same trend over time in the absence of the treatment (Abadie, 2005; Ashenfelter & Card, 1985). This assumption ensures that the untreated units (provinces that did not establish SEZs) provide appropriate counterfactual of the trend that the treated units (provinces that established SEZs) would have followed if they had not been treated. This is known as parallel trends assumption. As noted by Huntington-Klein (2022), parallel trend is inherently unobservable, meaning that it is a counterfactual of what would have happened if the treatment had not occurred. The parallel trends assumption is assessed by using a graphical exploration. Appendix B and Appendix C show the two groups' mean of real GPP per capita and poverty. The figures reveal that the treated (SEZs) and untreated (Non-SEZs) groups were trending similarly before treatment. The distance between these two groups stays roughly the same in the leadup to treatment, suggesting that the treated and untreated group would have continued having similar trends had treatment not occurred. The parallel trends assumption is therefore plausible in this case. Additionally, province specific linear time trends are included to rule out the possibility that treatment and control provinces were on the different growth (and poverty) trajectories in their outcome variables (Huntington-Klein, 2022). Put differently, it allows the time trend to be different for each province. This is to address the situation in which changes in the outcome variable would have occurred even in the absence of the establishment of special economic zone picked up by δ in Equations (1) and (2). Furthermore, heteroscedasticity-consistent robust standard error is used to address the concern about heteroscedasticity. The results are reported in the next section.

Results

Table 4 presents the effects of the SEZs on real gross provincial product per capita. As described in the Methodology section, the coefficient of interest is the DID estimate—that is, the coefficient on $POST_{it} \cdot SEZ_{it}$. Specification (1) performs the basic DID estimation without any control variables except time and province fixed effects. Coefficients on SEZ and POST are statistically significant at the one percent level. The coefficient on *SEZ* is 0.986, which implies that economic growth (measured by an increase in real gross provincial product per capita) in ten border provinces is higher than that in other provinces by 0.986 percent. The coefficient on POST equals 0.070, which implies that real gross provincial product per capita is higher in the period after 2015 compared to the period between 2012 and 2014 by two percent. The DID coefficient is -0.009 but not statistically significant. This means that economic growth in SEZs is not significantly higher after 2015 compared to non-SEZs. There is no additional growth in output over and above growth seen by non-SEZs.

As shown in Column (2), this result is robust to an inclusion of control variables. The coefficients on control variables are not statistically significant except for the manufacturing share. The DID coefficient is small negative but not statistically significant. The results withstand controlling for the treatment trend (see Columns (3) and (4)).

Table 5 reports the effects of the SEZs on poverty. As shown in Column (1), the coefficient on *SEZ* is not statistically significant. This suggests that poverty rates in SEZs are not statistically different from non-SEZs. The coefficient on *POST* is -0.694 and statistically significant at the 1 percent level. This indicates that poverty rates for the period 2015–2020 are lower than the period before 2015 by 0.7 percent.

Table 3 Summary statistics

Variable	Obs.	Mean	*SD*	Min	Max
SEZs	693	0.08	0.27	0.00	1.00
Real GPP per capita	693	100,625.00	98,462.62	26,329.50	547,218.30
Poverty rate	693	11.16	9.95	0.00	65.16
Workforce	693	497,829.80	583,024.20	106,473.70	5,287,679.00
Manufacturing output share	693	20.45	18.18	1.09	85.68

Table 4 The effects of the SEZs on real gross provincial product per capita using a DID method

Independent variable	Dependent variable: Real gross provincial product (log)			
	(1)	(2)	(3)	(4)
Post SEZ dummy (POST)	0.070***	0.068***	0.070***	0.068***
	(0.015)	(0.015)	(0.016)	(0.017)
Special Economic Zones (SEZ)	0.986***	1.024***	0.989***	1.026***
	(0.035)	(0.052)	(0.035)	(0.053)
POST X SEZ	-0.009	-0.012	-0.013	-0.015
	(0.012)	(0.012)	(0.027)	(0.026)
Initial GDP (IGPP)		-0.026		-0.027
		(0.049)		(0.050)
Labor force (LABOR)		-0.044		-0.044
		(0.028)		(0.028)
Manufacturing output share (MFG)		0.004*		0.004**
		(0.002)		(0.002)
Constant	10.432***	11.179***	10.432***	11.182***
	(0.025)	(0.360)	(0.025)	(0.359)
Province fixed effect	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Treatment trend	NO	NO	YES	YES
Number of observations	693	693	696	693
R-squared	0.993	0.993	0.993	0.993

Note: *$p < .05$, ** $p < .01$, *** $p < .001$.

Table 5 The effects of the SEZs on poverty using the DID method

Independent variable	Dependent variable: Poverty rate (log)			
	(1)	(2)	(3)	(4)
Post SEZ dummy (POST)	-0.694***	-0.696***	-0.712***	-0.715***
	(0.091)	(0.099)	(0.100)	(0.106)
Special Economic Zones (SEZ)	-0.189	-0.051	-0.074	0.089
	(0.157)	(0.504)	(0.184)	(0.515)
POST X SEZ	-0.054	-0.043	-0.083	-0.074
	(0.091)	(0.090)	(0.159)	(0.163)
Initial GDP (IGPP)		-0.018		-0.022
		(0.368)		(0.372)
Real gross provincial product (GPP)		-0.209		-0.216
		(0.370)		(0.372)
Labor force (LABOR)		0.037		0.041
		(0.230)		(0.231)
Manufacturing output share (MFG)		-0.034*		-0.034*
		(0.230)		(0.017)
Constant	3.116***	5.195	3.122***	5.260
	(0.142)	(4.707)	(0.146)	(4.746)
Province fixed effect	YES	YES	YES	YES
Year Fixed Effect	YES	YES	YES	YES
Treatment trend	NO	NO	YES	YES
Number of observations	690	690	690	690
R-squared	0.842	0.844	0.843	0.845

Note: *$p < .05$, ** $p < .01$, *** $p < .001$.

However, the coefficient on POST X SEZ is small negative but not statistically significant. This suggests that poverty incidence in SEZs is not significantly different from non-SEZs. The results hold after controlling for additional control variables and the treatment trend (see Columns (2)–(4)). Moreover, the coefficient on manufacturing employment share is negative and statistically significant at the 10 percent level. This suggests that an increase in manufacturing employment share is associated with a decline in poverty.

Robustness Check

For a robustness check, analysis using the same dataset was performed and the model was estimated by a system GMM estimator. The regression models are shown in Equations (3) and (4).

$$GPP_{it}=\alpha+\beta_1 SEZ_{it}+\beta_2 LABOR_{it}+\beta_3 BOI_{it}+\beta_4 MFG_{it}+\beta_5 IGPP_i+\mu_i+v_t+\varepsilon_{it} \quad (3)$$

$$POV_{it}=\alpha+\beta_1 SEZ_{it}+\beta_2 GPP_{it}+\beta_3 LABOR_{it}+\beta_4 BOI_{it}+\beta_5 MFG_{it}+\mu_i+v_t+\varepsilon_{it} \quad (4)$$

The number of investment projects approved by the Board of Investment (*BOI*) is included in Equations (3) and (4) to investigate whether investment in this scheme can stimulate economic activity in a province. As described by Arellano and Bover (1995), Blundell and Bond (1998), and Windmeijer (2005), the system GMM uses internal instruments which utilizes lags of regressors as instruments. The key identifying assumption of this estimator is that the estimators have a first-order serial correlation but not a second-order serial correlation. In addition, there is no over-identified instrumentation. While the estimates are sensitive to lag length, the system GMM is more appropriate to estimate Equations (1) and (2) than other estimators (e.g. fixed-effect estimator and instrumental variable method) mainly because exogenous features of the instruments for the SEZs are not available. It is thus not possible to estimate the model using the instrument variable (IV) estimator. Therefore, the system GMM seems the most appropriate estimator. The results are reported in Table 6.

Using a system GMM estimator, the coefficient on the SEZs in the growth equation is negative and statistically significant at the 5 percent level (See Column 1 of Table 6), implying that economic growth in ten SEZs is, on average, lower than that in non-SEZ areas (the rest of the economy). The results are robust to an inclusion of additional control variables such as initial gross provincial product, labor force, and manufacturing output share. Additionally, as shown in Column 4 of Table 6, the coefficient on the SEZs is positive and statistically significant at the 10 percent level. This suggests that poverty rate of SEZs is, on average, higher than that in other provinces. In summary, the results cast doubt on the objective of the SEZ development policy aimed to enhance the well-being and quality of life of people living in rural areas.

Discussion

In this section, an explanation is offered as to why SEZs in Thailand have not attracted investment. First, as discussed by Warr and Menon (2016), there are four domestic factors that are most important for a firm to decide to invest in the SEZs: (1) labor costs; (2) labor relations; (3) reliability and cost of infrastructure; and (4) ease of importing and exporting without costly delays. Given Thailand's development strategy in which labor-intensive export-oriented industrialization has been implemented for decades, labor costs play a crucial role in attracting investors either inside or outside the SEZs. According to the ILO (2022), the statutory gross monthly minimum wage in Thailand is US$220, higher than most ASEAN member states. Monthly manufacturing wages, perhaps a good guide to those paid in the SEZs, have increased from 10,154 Baht in 2011 to 13,559 Baht in 2020. Wages in manufacturing sector grew at a faster than rate between 2012 and 2020 than in agriculture. While raising wage can be viewed as an outcome along the process of economic development, it suggests that the scope for expanding labor-intensive manufacturing in SEZs is small if productivity

Table 6 The effects of SEZ on real gross provincial product per capita and poverty rate using a system GMM estimator

Independent variable	Dependent variable: Real gross provincial product (log)			Dependent variable: Poverty rate (log)		
	(1)	(2)	(3)	(4)	(5)	(6)
Special Economic Zones (SEZ)	-0.026** (0.013)	-0.024* (0.013)	-0.025* (0.013)	0.409* (0.213)	0.464** (0.233)	0.559* (0.262)
Number of BOI projects (BOI)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.004 (0.004)	-0.004 (0.005)	-0.004 (0.005)
Initial GDP (IGDP)			0.033 (0.093)			-1.290 (0.818)
Real gross provincial product (GPP)				-0.864*** (0.282)	-1.103*** (0.367)	-0.274 (0.738)
Labor force (LABOR)	0.036 (0.028)	0.051* (0.029)	0.015 (0.099)	0.025 (0.295)	0.153 (0.361)	1.603* (0.836)
Manufacturing output share (MFG)		0.001 (0.001)	0.001 (0.002)		0.017 (0.027)	0.033* (0.017)
Constant	-0.005 (0.362)	0.013 (0.377)	0.391 (0.963)	10.85** (5.012)	11.64** (5.080)	-2.584 (9.249)
Year dummy	YES	YES	YES	YES	YES	YES
Number of observations	462	462	462	457	457	457

Note: *$p < .05$, ** $p < .01$, *** $p < .001$.

does not increase. Appendix A reports labor productivity in each manufacturing sector between 2016 and 2019. Several targeted industries for special incentives in SEZs saw a decline in labor productivity, for example, leather products, rubber and plastic products, medicine, motor vehicles and parts and textiles. The gems and jewelry industry and the medical device industry also posted a notable decline in labor productivity during this period. Therefore, increasing labor costs and declining labor productivity in targeted industries in SEZs have made investments in labor-intensive manufacturing less attractive. Educational investment is required to raise the productivity of the workforce, offsetting the costs of higher wages.

Second, a special economic zone is created to reduce the costs of doing business, thereby attracting investment into the zone. Warr and Menon (2016) point out that ability to attract investment into the zone is not whether the SEZ programs make investment climate improvements over their domestic environments but whether the investment environment within the zone is more competitive than that in alternative international sites that are available to a firm looking to reduce the costs associated with poor domestic infrastructure, property rights, red tape, and trade restrictions. In addition to the SEZs in ten border provinces, Thailand's EEC was established in 2018. The EEC spans three provinces in eastern Thailand. This initiative is central to the strategy "Thailand 4.0" aimed at transforming the country into an innovative, value-based economy. Target industries are the S-curve and new S-curve industries: next-generation automotive, intelligent electronics, advanced agriculture and biotechnology, food for the future, high-value and medical tourism, automation and robotics, digital, aviation and logistics, comprehensive healthcare, and biofuel and biochemical industries. While the SEZs and the EEC are not necessarily competing, some targeted activities in these two policy initiatives overlap such as agro-industry, electronics, and automation. An inability to attract significant levels of investment into the zones since 2015 may be partly because the SEZs in ten border provinces do not offer more significant cost advantages compared to the EEC or other sites outside the SEZ.

Conclusion

This paper has examined Thailand's recent establishment of special economic zones in ten border provinces in 2015 and 2016. Using a province-level panel data set from 2012 to 2020, it was found that the SEZ program did not attract significant levels of investment into the zones as it had intended. The results from an econometric analysis show that these SEZs did not create local socioeconomic development. After implementing the SEZ policy in 2015, the provinces that created a SEZ did not experience a higher rate of provincial real GDP growth compared to those outside the zones. When comparing with non-SEZs, the provinces that established a SEZ also did not experience a faster progress in poverty reduction.

The findings of this paper cast doubt on the key feature of Thailand's SEZs. The SEZ program may not create a more favorable investment environment and more attractive fiscal incentives compared with alternative international sites outside the SEZs. Policy makers should ensure that the SEZs in ten border provinces offer higher significant cost advantages to firms in specific industries compared to non-SEZs area within Thailand including the EEC. Moreover, current labor market conditions (increasing manufacturing wages and relatively high minimum wage) may discourage labor-intensive manufacturing to make a new investment in the zones, thereby not generating new employment. Investment in education and special training to workers can help increase labor productivity, thereby offsetting such increasing cost.

Conflict of Interest

The author declares that there is no conflict of interest.

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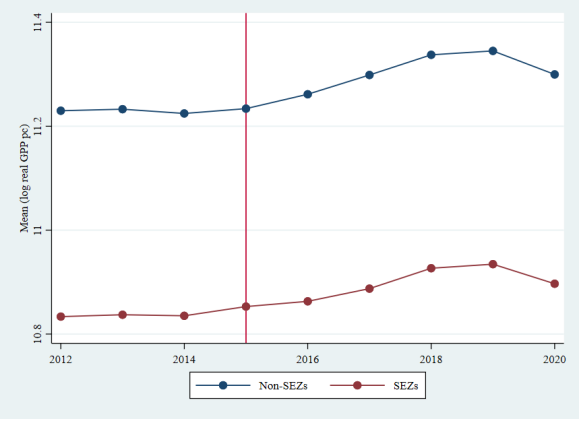
Appendices

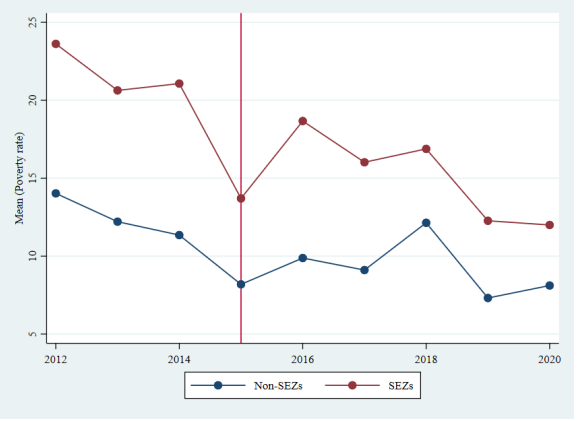
Appendix A Labor productivity by manufacturing sector between 2016 and 2020

Manufacturing sector	2016	2017	2018	2019	2020	Δ2016–2020
Food products	98.46	97.99	98.43	99.89	98.43	-0.03
Beverages	100.13	101.96	99.48	112.03	108.58	8.45
Tobacco products	99.97	89.92	83.64	85.25	95.10	-4.87
Textiles	100.02	101.85	106.07	105.35	94.91	-5.11
Wearing apparel	100.06	98.45	101.91	98.91	103.48	3.42
Leather and related products	101.21	98.38	102.99	94.88	78.32	-22.89
Paper and paper products	100.05	103.26	102.44	102.61	108.46	8.40
Coke and refined petroleum products	100.14	104.00	99.06	92.28	92.39	-7.75
Chemicals and chemical products	99.74	100.26	101.62	100.99	98.63	-1.11
Basic pharmaceutical products	99.94	105.86	113.65	109.18	89.95	-9.99
Rubber and plastics products	100.07	101.53	90.86	87.52	89.42	-10.64
Non-metallic mineral products	100.01	99.63	104.51	105.18	104.90	4.90
Basic metals	99.98	102.15	104.13	97.38	96.23	-3.75
Fabricated metal products	99.97	99.47	104.68	97.83	92.10	-7.87
Computer, electronic and optical products	99.83	97.28	97.95	95.40	96.79	-3.04
Electrical equipment	99.80	97.59	96.96	98.08	102.60	2.80
Other machinery and equipment	100.30	87.35	87.40	93.33	93.62	-6.67
Motor vehicles, trailers, and semi-trailers	99.81	106.00	115.71	108.93	90.78	-9.03
Other transport equipment	99.94	102.91	112.06	108.01	94.72	-5.23
Furniture	99.89	113.73	108.45	110.50	109.43	9.55
Other manufacturing	99.97	91.85	90.12	86.65	83.89	-16.08
Total	99.72	100.72	101.66	99.68	95.91	-3.80

Source: Office of Industrial Economics (2022)



Appendix B Mean of log real GPP per capita



Appendix C Mean of poverty rate