

Dung Quat Oil Refinery contributes to the economic development of Quang Ngai province¹

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Abstract: *Dung Quat Oil Refinery is a national key project that plays a crucial role in ensuring energy security, helps accelerating the process of industrialization and modernization of Quang Ngai province in particular, the Central region and Vietnam in general. Using statistical data for the period 2000-2021, the article analyzes, evaluates and clarifies the role of Dung Quat Oil Refinery in the economic development process of Quang Ngai province. Research results show that it makes a great contribution to the economic development of Quang Ngai province as an important driving force in the local industrial growth. On that basis, some policy implications are proposed to improve its efficiency.*

Keywords: Dung Quat Oil Refinery, Economic Growth, Central Key Economic Region, Quang Ngai Province

1. Introduction

The development of the petrochemical industry has direct and indirect effects on regional and local socioeconomic development, of which the economic

impacts have been addressed in various research projects². Dung Quat Oil Refinery (DQOR) is the first modern petrochemical refinery in Vietnam. The factory was built

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² Nanok and Onyango (2017) demonstrate that petrochemical industry promotes the development of trade while Chaudhuri and Ray (2019) prove that the petrochemical industry helps increase people’s income and government’s tax revenues. Dowokpor (2015) and Ebebulen et al (2013) also affirm job generation by the petrochemical industry for local people.

in Binh Tri and Binh Thuan communes, Binh Son district, Quang Ngai province on a total area of 956 hectares (including 485 hectares of land, 471 hectares of water surface, and an expansion of 140 hectares). DQOR officially started its construction on November 28, 2005 and then went into trial operation in 2009, marking the birth of Vietnam's petrochemical refining industry. In 2011, the factory finished its test run and officially went into commercial phase with a capacity of about 6.5 million tons of crude oil per year, targeting 7.5 million tons per year in the scaling up phase (Binh Son Refining and Petrochemical Joint Stock Company (BSR), 2023a)¹.

enhancement. At DQOR, BSR also ensure employee and social security policies and promote the positive impacts on the socioeconomic development of the central region and Quang Ngai province.

2. Economic contribution of Dung Quat Oil Refinery to Quang Ngai province

2.1. Economic growth

Analysis of the Gross Regional Domestic Product (GRDP) growth rate of Quang Ngai province and the provinces of the Central Key Economic Region (Central KER) in the 2000-2021 period (Table 1) (Figure 1) indicates the significant dependence on DQOR. Any changes of DQOR impacted greatly Quang Ngai's GRDP growth.

Table 1. Provincial GRDP growth rates in the Central Key Economic Region, 2006-2021

Unit: % (2010 constant prices)

Province/ Year	2006	2007	2008	2009	2010	2011	2013	2014	2015	2016	2017	2018	2019	2020	2021
TT Hue	11.47	12.58	10.79	12.54	12.49	10.73	7.89	8.27	-14.98	13.50	8.15	6.87	3.55	2.22	4.36
Da Nang	11.00	9.26	24.04	11.75	12.92	11.45	8.37	9.42	8.71	21.49	6.53	7.95	9.45	-8.20	0.18
Quang Nam	12.57	13.45	11.86	10.33	12.04	12.58	11.07	13.43	-0.12	26.31	4.62	9.41	8.92	-5.49	5.05
Quang Ngai	12.98	14.62	11.79	22.39	39.35	6.36	16.21	0.66	11.92	5.10	1.29	9.46	-1.20	-1.08	6.05
Binh Dinh	12.16	12.76	10.28	8.74	13.95	5.45	4.85	6.53	6.42	6.84	6.74	7.28	6.28	3.45	4.13

Source: Statistical Yearbooks of provinces in the Central Key Economic Region, 2000-2021.

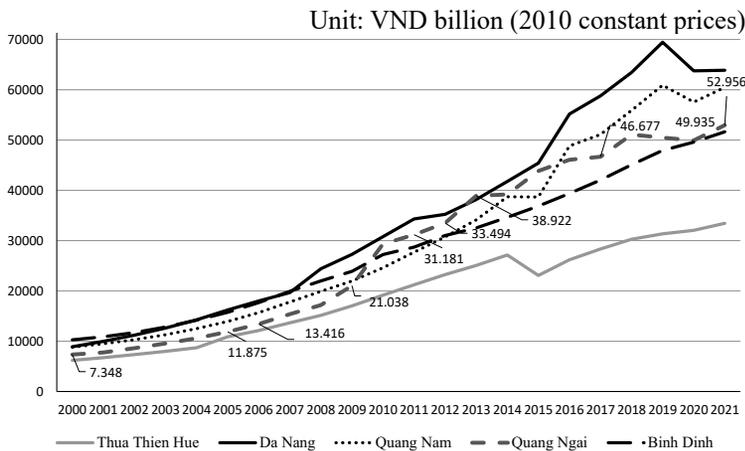
DQOR throughout its development process has indeed made significant socio-economic contributions, creating 1,528 direct jobs and providing training and capacity building for 7,871 officers and workers (BSR, 2023b). The successful performance of DQOR also added incomes into the local and central budgets and played as a driving force of the local development and e of the local business competitiveness

In 2006, after the DQOR construction began, the project's large amount of investment capital together with the government's infrastructure investment had boosted the GRDP growth of Quang Ngai province to 12.98% in 2006 and 14.62% in 2007, much higher than those prior to the project.

In 2009, the trial operation of DQOR had added production values to the provincial economy, resulting in a surge of Quang Ngai's GRDP growth rate to 22.39% (10.6 percentage points higher than that of 2008)

¹ BSR is the assigned management authority of Dung Quat Oil Refinery.

Figure 1. Provincial GRDP in the Central Key Economic Region, 2000-2021



Source: Statistical Yearbooks of provinces in the Central Key Economic Region, 2000-2021.

and to 39.35% in 2010 (16.96 percentage points higher than that of 2009). DQOR was a key factor driving Quang Ngai's economy to the top of the Central KER provinces in terms of GRDP growth rate.

In 2011, DQOR finished its two-year trial run and began its commercial operation. It also underwent an overall maintenance, which resulted in a temporary stopover and decreased production output. Quang Ngai's economic growth in 2011 also slowed down significantly, reaching only 6.36%.

In 2014, DQOR conducted another maintenance and Quang Ngai's economic growth fell drastically to 0.66%, 15.55 percentage points lower than in 2013. When DQOR went back to its normal operation in 2015, the provincial GRDP growth recovered at 11.92%.

In 2017, DQOR was again maintained and Quang Ngai's GRDP growth rate decreased by 3.81 percentage points compared to 2016, reaching only 1.29%, but bounced back by 8.17 percentage points in 2018.

In 2020, DQOR's overall maintenance coincided with the Covid-19 severe

impacts on Quang Ngai and the Central KER provinces. Along with the supply chain disruption, many provinces had negative growth rates such as Quang Ngai (-1.08%), Quang Nam (-5.49%), and Da Nang (-8.2%). In 2021, when the Central KER economy recovered from the pandemic and DQOR returned to normal operation, Quang Ngai's growth rate was 6.05%.

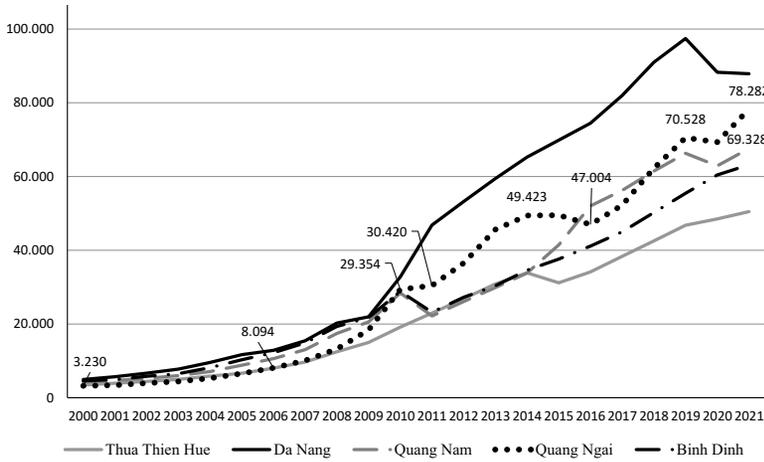
In the 2016-2017 period, Quang Ngai's GRDP per capita decreased in 2016 but regained its growth in 2017, which was higher than the Central KER's average, placing the province only behind Da Nang city (Figure 2). In 2021, Quang Ngai's annual GRDP per capita reached VND78,282 million, higher than the regional average of VND69,486 million, and stayed stable largely thanks to the contribution of the industry and construction sector, which accounted for about 50% of the economy throughout the period of 2009-2021. In particular, 63.2% of the province's manufacturing and processing production came from DQOR.

2.2. Economic transition

Back in the years of 2000-2005, Quang Ngai remained an agriculture-based economy with agriculture being the largest contributor, followed by services and industry. In 2000, the agriculture sector accounted for 44.6% of the province's GRDP while the shares of services and industry were 30.5% and 24.9%, respectively. At the time, light industries and handicrafts dominated the province's industrial production (Figure 3).

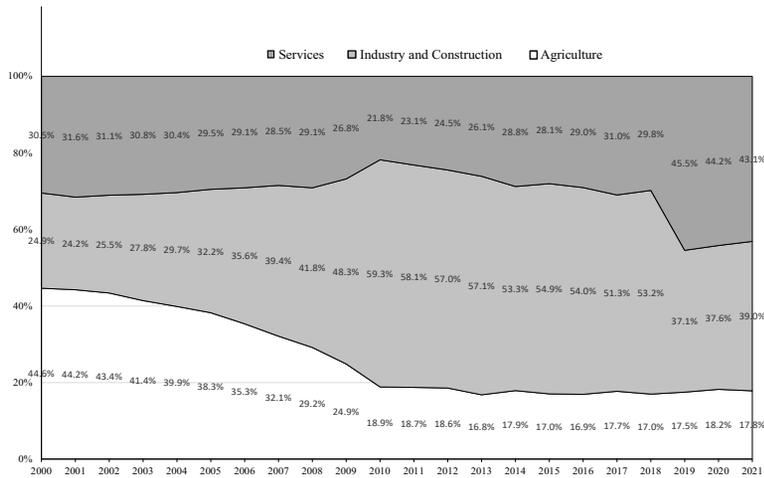
Figure 2. Provincial GRDP per capita in the Central Key Economic Region, 2000-2021

Unit: VND thousand (current prices)



Source: Statistical Yearbooks of provinces in the Central Key Economic Region, 2000-2021.

Figure 3. Economic structure of Quang Ngai province, 2000-2021



Source: Statistical Yearbooks of provinces in the Central Key Economic Region, 2000-2021.

As DQOR was put into operation in 2006, the province’s industry for the first time became the leading sector (35.6%) against agriculture (35.3%) (Figure 3). The establishment of DQOR thus set a foundation for industrialization and modernization to occur in the Central KER and Quang Ngai and the provincial economy since then had transited towards

a gradual increase of industry and services and a shrinkage of agriculture. The 2006-2010 period saw not only the birth of DQOR but the Dung Quat Economic Zone as well. Quang Ngai’s industry advanced quickly and strongly to become the province’s spearhead economic sector. The industry sector enlarged from 35.6% in 2006 to 59.3% in 2010, a difference of 23.7 percentage points within four years since the construction of DQOR until the end of its trial period (Figure 3). As above mentioned, during this period, a large volume of investment capital and labor poured into the province to serve infrastructure construction. As a result, the growth of industry and construction surged in comparison with other economic sectors.

In the following period of 2011-2018, DQOR entered its commercial operation and Quang Ngai’s industry continuously contributed more than half of the province’s production, from 58.1% in 2011 to 53.2% in 2018. Industrialization and modernization took place in Quang Ngai and drove the increase of services, from 21.8% in 2010 to 29.8% in 2018. The proportion of agriculture accordingly was

down from 18.9% in 2010 to 17% in 2018 (Figure 3). There was also an employment shift between the sectors of agriculture and industry-services during this period, which was mainly happened in the Dung Quat Economic Zone, the industrial zones of Tinh Phong and Quang Phu, and Vietnam Singapore Industrial Park (VSIP)¹. The recent period of 2019-2021 faced with the complicated developments of the Covid-19 pandemic and serious disruptions of the supply chains. As a consequence, Quang Ngai produced negative economic growth, which was attributed greatly to the decline of industrial production as a result of DQOR's decreased sales. The province's economy experienced a sudden structural change as the share of the industry sector dropped to 37.1% in 2019 and grew slightly to 39% in 2021 (Figure 3). Thus, the economic structure of Quang Ngai province is greatly influenced by DQOR's production and business activities.

2.3. Local budget revenues

Quang Ngai's total budget revenue in 2000, about VND960 billion, was considered low in comparison with Da Nang and Thua Thien Hue. This number was even lower in 2004 and the lowest among the Central KER provinces. Not until the construction of DQOR in 2006 did the province rise to the second, only after Da Nang, in terms of budget revenue for VND2,754 billion (Figure 4).

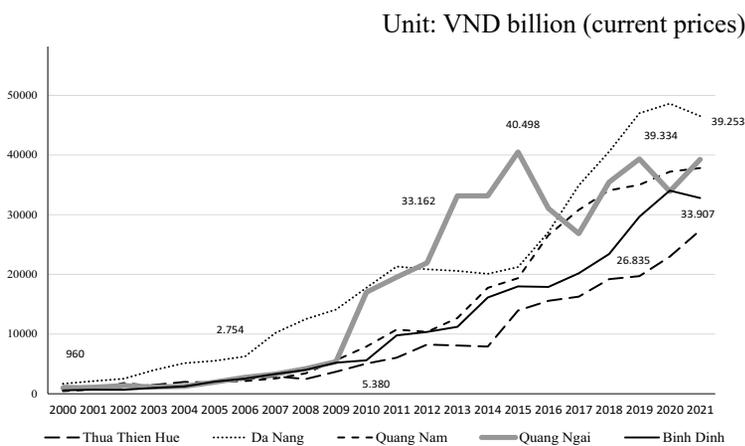
Since the operation of DQOR, the province's budget revenue grew spectacularly, from VND5,380 billion in 2009 to VND21,930 billion in 2012, or 3.07 times larger within just four years (Figure 4). Quang Ngai then surpassed Da Nang to become the largest revenue contributor in the Central KER despite its smaller GRDP against Da Nang's.

DQOR produced about 80%-85% of Quang Ngai's total budget revenue, which enlisted the province in the country's top budget contributors in 2012-2016. Quang Ngai's budget revenue reach its peak in 2015 with VND40,498 billion, about 1.9 times of Da Nang's (Figure 4).

However, the budget revenue of Quang Ngai fluctuated in 2017-2021 compared to other provinces in the Central KER, which was the result of oil price fluctuations and DQOR's maintenance periods.

DQOR since its commercial phase up to now has been always operating at its full (100%-107%) capacity. DQOR imported more than 1,100 oil shipments of nearly 90 million tons of

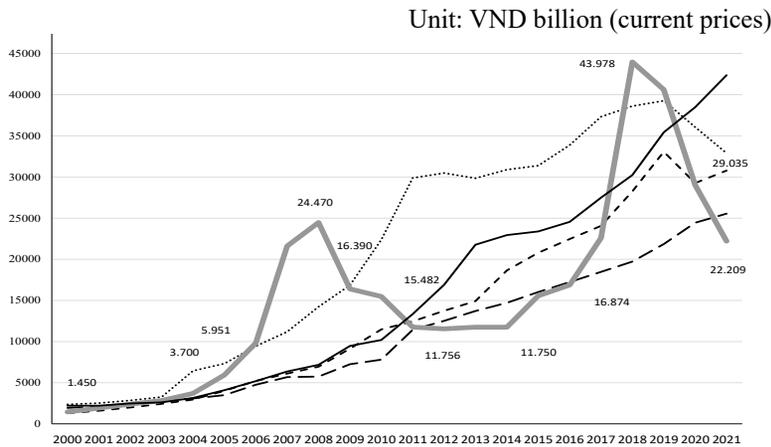
Figure 4. Budget revenues of provinces in the Central Key Economic Region, 2000-2021



Source: Statistical Yearbooks of provinces in the Central Key Economic Region, 2000-2021.

¹ VSIP runs large-scale projects in seven provinces, including Binh Duong, Bac Ninh, Hai Phong, Hai Duong, Nghe An, Binh Dinh, and Quang Ngai.

Figure 5. Total investment capital of provinces in the Central Key Economic Region, 2000-2021



Source: Statistical Yearbooks of provinces in the Central Key Economic Region, 2000-2021.

crude oil for more than 80.1 million tons of finished products, over VND1.35 million billion of sales revenues, and VND200 trillion contributed to the state budget. In 2022 alone, DQOR produced VND7 million tons of all kinds of products to service more than 30% of the domestic petroleum demand and generated VND167,057.8 in sales revenues. In the same year, DQOR contributed VND18,300 billion to the state budget, reached VND14,836.2 billion of profit after tax (BSR, 2022), created 1,500 direct jobs and thousands of indirect jobs in maintenance and repair services (BSR, 2023b).

2.4. Investment capital

The 2000-2021 total investment capital of Quang Ngai province (Figure 5) was cyclical with two peak-and-troughs in two different economic contexts. In the first stage of 2000-2011, Quang Ngai's economy remained modest and largely depended on the DQOR investment and construction, of which the first batch was worth VND5,951 billion for site clearance. The investment capital flows for DQOR fluctuated in the following years of 2005-

2011 and associated with important milestones of the project, often one year lagged for the actual implementation activities. For example, for the fundamental construction investment phase in 2005-2008, Quang Ngai's total investment capital increased from VND5,951 billion in 2005 to VND24,470 billion in 2008, or 4.11 times higher after three years of the project. When the construction of DQOR completed and its operation began after 2009, the investment capital in the province decreased from its peak of VND24,470 billion in 2008 to VND11,756 billion in 2011. There were no significant changes in Quang Ngai's investment capital volume, which was averaged at VND11,750 billion per year in the 2010-2014 period. A sudden increase after that in 2017-2019 was attributed to an investment in steel production by Hoa Phat Group. In other words, the changes in Quang Ngai's investment capital in 2005-2011 mainly stemmed from the DQOR's spillover impacts on drawing investments into the province.

3. Quang Ngai's economic development issues in association with Dung Quat Oil Refinery

3.1. DQOR dependent and unstable and unsustainable economic growth of Quang Ngai

Being too dependent on DQOR poses challenges to the sustainable economic development of Quang Ngai, particularly due to its heavily industry-led growth

and DQOR-dependent budget revenue. Meanwhile, the DQOR revenues are also subjected to oil price fluctuations, energy security, political conflicts, global financial markets, pandemics like Covid-19, or even in cases of DQOR periodical maintenance. The substantial reliance on DQOR might lead to macro risks to the local economy. The analysis above shows that every change in the DQOR performance would greatly impact Quang Ngai's GRDP, economic structure, and budget revenue. Relying too much on one single business results in Quang Ngai's unsustainable economic growth.

3.2. Limited spillover effects of DQOR on regional economic development

Although DQOR plays a critical role in the socioeconomic development of Quang Ngai, its impacts on the economic development of the Central region remains restricted and have been rather localized in Binh Son district and its surrounding areas. The survey by Hoang Hong Hiep (2022) with industry managers in neighboring provinces of Quang Ngai (including Quang Nam and Binh Dinh) confirmed the role of DQOR was indeed more intra-regional. This could be reasoned by the fact that petrochemical refining industry is comparatively specialized in comparison with others. Businesses in order to be part of its supply chain should operate in large scale at a higher level of technology, with quality human resources and, in particular, a close association with the petrochemical industry, which are currently out of the reach of the Central businesses. Furthermore, the constraints of intra-regional infrastructure also restrict the spillover effects of DQOR at the time of its construction and initial operation. As a result, the role of DQOR in promoting regional linkages is still limited.

3.3. The absence of a petrochemical refining ecosystem in the Central region

The leading role of DQOR, in practice, could only be maximized if there is an ecosystem of the petrochemical industry. The economic links between DQOR and other businesses in the region seem not yet to develop, not to mention the weak auxiliary industries centered around DQOR. Moreover, petrochemical and post-petrochemical enterprises are not located in the Central to take the most advantage of DQOR in the region.

4. Conclusion and policy implications

Quang Ngai province, firstly, needs to focus on services-associated industrial development and perfect its policies to attract more industrial and service firms to Dung Quat Economic Zone. In particular, Quang Ngai province should actively propose, in coordination with ministries and central agencies, the national energy and petrochemical center to be established in the province within the framework of the Politburo's Resolution No. 26-NQ/TW (Resolution 26) dated November 3, 2022 on socio-economic development and national defense and security in the North Central region. This should be the first step for forming a petrochemical ecosystem to DQOR, which would help scale up the impacts of DQOR on the economic development of Quang Ngai and the Central region. Resolution 26 can be seen as a second opportunity, after the establishment of DQOR, that Quang Ngai province should seize in order to maximize the advantages of DQOR.

Secondly, ministries and local governments need to fully acknowledge DQOR and BSR as not only a petrochemical enterprise but a nuclear enterprise with great contribution to

the national, regional, and local economic development. The policies for regional and local development should accordingly take into account the role and the advantages of DQOR.

Thirdly, as a lesson learned from the case of DQOR, the government should define further policies for its national key investment projects in addition to investment capital. Supporting policies would help amplify the spillover impacts of such projects at both local and regional level. In other words, more attention should be paid to forming linkages to promote the investment impacts, such as better physical connectivity within the region and between regional economic centers through modern transportation infrastructure. The spillover impacts of DQOR would have been greater at the regional level if the infrastructure and transportation system available to connect Dung Quat with Da Nang and Binh Dinh. Fourthly, Quang Ngai should prioritize the completion and upgrade of the Dung Quat Economic Zone infrastructure for more sustainable industrial development. In particular, it is necessary to expand and upgrade routes of high traffic volume and accelerate the connection from Da Nang-Quang Ngai expressway to Dung Quat Economic Zone. The completion of Dung Quat inter-port road and the Doc Soi-Chu Lai airport route would facilitate the development of Dung Quat Economic Zone in association with Chu Lai international airport as well as the route that connects National Road 24C to the Central Highlands and southern Laos through Truong Son Dong road. In particular, calling for investment in an industrial waste treatment center to serve

businesses in Dung Quat Economic Zone should be also a priority.

Fifthly, BSR needs to develop a branding strategy to position itself as a nuclear enterprise in the Central region and Quang Ngai province. In addition, corporate social responsibility should be focused in a more practical way at the local and regional levels and, particularly, among the local communities where the DQOR is located, targeting groups of people who are disadvantaged from the process of DQOR construction and operation □

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