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Natural gas consumption and economic growth nexus: Is the 10th Malaysian plan attainable within the limits of its resource?

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ABSTRACT

The 10th Malaysia Plan (10MP) is a strategic plan focused on attaining a level of economic growth that will enable the country to attain a developed nation status by 2020. As a result of this ambitious plan, this paper aims to investigate empirically if the nexus between natural gas consumption, exports, capital and labour could provide a clue to the possibilities of reaching this target. The study applied time series data from 1971 to 2012 and used dual structural break tests. To ensure robust result, the Bayer–Hanck cointegration, Johansen cointegration and the ARDL bounds tests were applied. The findings of the study reveal that economic growth does not Granger cause natural gas consumption in Malaysia. However, the results show that capital and export contribute 29.18% and 41.46% to the country's GDP after 20.04% and 42.29% of natural gas consumption respectively. Also it suggests that natural gas consumption has an indirect effect to the Malaysian economic growth wherewithal. Labour was on the other hand, found to have a minimal contribution to GDP. The study proposes the efficient exploitation of natural gas reserves of the country, a concerted effort to develop the labour force and ensure a realistic time for the plan among others.

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1. Introduction

Since independence in 1957, the Malaysian Government has set its goal on the attainment of a faster rate of economic growth, a lower degree of economic instability and a lower level of unemployment among others. In 2001–2010, National Vision Policy (NVP) was formulated with the most comprehensive and several critical thrusts, aiming to build a resilient nation through the

possibilities of fostering the quality of life and increasing economic resilience. In addition, the plan also seeks to ensure sustainable high economic growth by means of strengthening the sources of growth, basically through the financial and corporate institutions, as well as prudent macroeconomic management. The NVP plan is also aimed at promoting competitive capabilities of all the indigenous productive entities in the country by enabling them to meet the challenges of globalisation and liberalisation. To ensure this, the plan was coined in such a framework where the labour force of the country will be strengthened to provide a competent, productive and knowledgeable working environment with high innovation, competencies and capabilities, and to equally pursue environmentally friendly developmental prospects that are in line

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with the Kyoto agreement. The thrust of this is to enable Malaysia to achieve the status of being a developed nation [20]. Following to this, the government through various innovative strategies launched the New Economic Model (NEM) entitled Economic Transformation Programme (ETP). Within the ETP lies the 10th Malaysia Plan 2011–2020 (10MP) and this was defined as a strategic means of providing new policy directions. Complementing this line of development are some strategies and programmes that were outlined within the 10MP, basically with the main thrust of determining a way towards the attainment of the developed nation status, and this is to be ensured by achieving a gross national income per capita of RM38,850 or US\$12,140 in 2020, meaning that the real GDP is expected to grow by 6%, annually and continuously [20].

According to the above mentioned projections, this study raised the question of what could be the contributions of natural gas consumption, labour, capital and exports towards boosting the Malaysian economic growth prospects to aid in the attainment of the 10th Malaysian Plan. Are these factors efficient drivers to warrant such an overwhelming economic transformation? This is because Hosseini and Abdul Wahid [16] reported that Malaysia is blessed with 43 trillion cubic feet of NG reserves in 2012 and 50.123 trillion cubic feet in 2013, making it the third largest natural gas reserves holder in the Asia-Pacific region after Qatar. In addition to that, the EIA [10] reported that the world's natural gas consumption as a percentage of total energy consumption increased from 21% in 1990 to 23% in 2007. The EIA continued to assert that the total natural gas consumption around the globe was expected to rise by 18% annually from 2007 up to 2035. Considering the current decreasing prices of fossil fuel could this be an added advantage to the Malaysian economic growth prospects. In another related development and while progressing on the significance of natural gas consumption Apergis and Payne [4] expatiated on the economic superiority of natural gas over other fossil fuels. The authors maintained that natural gas generates a relatively low level of carbon dioxide emissions (CO_2), better operational flexibility, and efficiencies, reduced and lower capital costs in comparison to fossil fuels. Underscoring the practical potentialities of these facts, the authors further argued that it would be beneficial for natural gas to supplant all other form of energy supply in both the industrial and household level. This is because, natural gas has the most expedient requirements that will enable the speedy actualisation of the Kyoto target of reducing CO_2 emissions and ensure environmentally friendly working condition in line with the expectation of the 10th Malaysian Plan. It will also secure nations from the dangers of nuclear energy disasters as seen in the case of Japan and provide vibrant and efficient energy independence with more revenue generation possibilities.

In another related development, Shahbaz et al. [29] argued that the estimated long-run impact of natural gas consumption on economic growth is greater than other factor inputs, suggesting that natural gas energy is a critical driver of production and economic growth. The causality analysis in their study suggests that natural gas consumption and economic growth are complements, given that natural gas conservation in Pakistan could harm economic growth. Earlier to that line of evidence, Nanthakumar and Subramaniam [21] argued that Malaysia, like most developing countries in the Asian region, has an energy intensive economy. This made the energy consumption of the country to escalate rapidly without a commensurate increase in economic growth prospects required. According to the authors, economic growth has remained volatile over time, but the level of energy use was still maintained with an increasing trend. Notwithstanding this line of argument, Ahmad and Mat Tahar [1] argued that from 2000 the Malaysian government has implemented five fuel

diversification strategies in its energy mix, natural gas inclusive. However, and in spite of this development, fossil energy has the major share of the total components of the country's energy mix (Fig. 1). Does this mean natural gas has no meaningful economic contribution to the Malaysian GDP despite its huge existing reserve as established by Hosseini and Abdul Wahid [16]? It is in reference to this development that this paper investigates empirically and analyses if the nexus between natural gas consumption, capital, labour and exports could provide a clue to the possibilities of boosting the Malaysian economy towards attaining the target of economic growth envisaged in the 10th Malaysia plan. In addition, the growing need for natural gas, the dynamics of labour force, export and capital as well as their implications for economic growth require one to understand the link between them to better inform the policy makers on the available policy options, and likely economic repercussions.

Moreover, it is imperative at this juncture to assert that a dynamic labour force and capital are among the crucial factors of production that allow the exploration and exploitation of resources in any given productive economic system. However, the role of exports in boosting economic growth cannot be over-emphasised considering that Malaysia has an industrially driven economy. For instance, exports increase total factors of productivity because of their impact on economies of scale and other accommodating externalities attach to export such as technology transfer, improving workers' and managerial skills, and increasing production capacity. It also allows for a better utilisation of resources and does not discriminate the domestic market [15]. Fig. 1 shows the energy composition as used in the Malaysian energy mix strategies. Natural gas is found to constitute the second largest energy consumption of the country.

2. Literature review

Multiplicity of studies was conducted to examine the causal relationship on how natural gas consumption could boost economic growth using different methodologies and continental background. Some of these studies applied time series data while others used panel data. Notable among these studies are: Yu and Choi [35] where the authors studied UK, US and Poland; while Yang [32] used time series data to study natural gas consumption and economic growth in Taiwan. Siddiqui [31] on the other hand observed the relationship between natural gas consumption for the case of Pakistan, Fatai et al. [13] for New Zealand and Australia, Ewing et al. [11] for US, Sari et al. [28] for US, Zahid [36] for five

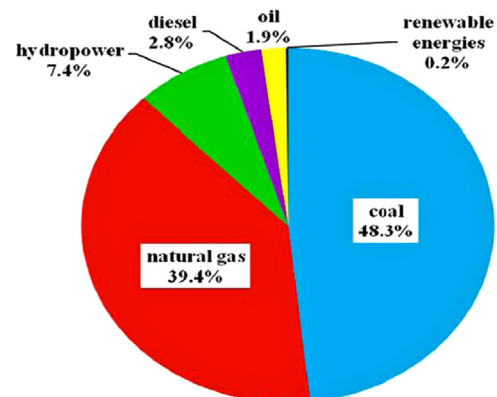


Fig. 1. Energy composition in Malaysia in 2012.
Source: Malaysia Energy Commission [19]

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