

Research Budget Improves National Product Independence: A National Resilience Perspective

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Abstract

The current fundamental problem is the low national research budget, as well as the lack of domestic product innovation so that it will have an impact on the lack of innovation in creating the latest products and defense technology that is still unable to be produced domestically and requires imports of raw materials. This will be potentially bad for a country's national resilience with the country's dependence on foreign products, which will pose a vital risk to the survival and resilience of the nation in the face of crisis. National resilience as the ability of a country to protect its welfare, identity, and political integrity actual and potential threats. There are several elements in the form of ideological, political, social, economic and military. The purpose of this study is to analyze the potential of the research budget in increasing the independence of national products and formulate recommendations in optimizing government policy. This research uses a qualitative descriptive method with a literature study approach, collecting secondary data sourced from official reports, journal articles, and government publications related to the topic of this research. Analysis is conducted on the current condition of imported product dependence and domestic product innovation capacity, when looking at opportunities and challenges in increasing national product independence. The results of this study show the potential of the research budget. If the research budget is increased in order to make the latest innovations and produce domestic strategic products, in order to increase the independence of national products, there is great potential for innovation and encourages the acceleration of the latest strategic innovations in domestic products. So that it can be expected to be a reference for the government in increasing the independence of national products so as to reduce dependence on imported products.

Keywords: *Research Budget, National Resilience, Import Dependence*

INTRODUCTION

In Indonesia, the philosophy and geostrategic interpretation of Archipelago Insight is the philosophy of national resilience, a geopolitical interpretation. National resilience is one of the political concepts of the Unitary State of the Republic of Indonesia. A dynamic state where a country faces and overcomes challenges, threats, obstacles and disturbances both from within and outside the country. One of the most important aspects of national resilience is independence. Independence here can be interpreted as the ability of a country to meet its national needs, protect national rights and security in economic, social and cultural aspects. (Lembaga Ketahanan Nasional, 2016)

Research budgets are important for creating the latest innovations to increase the independence of national products so as to strengthen national resilience. It is used as a planning, control and decision-making tool in research management. Because the budget will help us to understand how much money we have, how much has been spent, and how much money is needed in the future. (Edi Yanto et al., 2022)

Independence of national products is one of the important components in a country's national resilience. The government urges people to use domestic products by making the Domestic Product Use Improvement Program one of the Government's efforts to maintain national economic resilience and stability, strengthen domestic industries, while reducing import

dependence (Kementerian Keuangan RI, 2023). This is a priority for the government in increasing domestic products which will be important for the Indonesian economy.

The ability of a country to produce its own essence and sovereignty-defining products such as food, energy, health, and defense is called national product independence (Tjandra S, 2021). This is done by the government to make Indonesia able to compete with other countries in the world. The continuity of the country and the resilience of the Indonesian nation depend on the independence of national products. Research funding is an important component in improving national self-reliance. Research is a scientific endeavor to discover, develop, and test the truth of a theory. Research results can be used to improve the efficiency, productivity and competitiveness of national products (Departemen Pertahanan Indonesia, 2022).

Ideally, every country should have strong research and development (R&D) capabilities to encourage innovation of domestic products, so as to achieve national product independence. According to the National Science Foundation (NSF) in the United States, states that the national research and development (R&D) budget should reach 3% of the total Gross Domestic Product (GDP), while developing countries are at least 1% of GDP, so that they can compete globally. This is done to reduce the country's dependence on imported products, improve the quality of existing products, this investment will help the United States to develop new product innovations that have high added value, and mathematics. In addition, an increase in the budget impact because it can create new welfare, jobs in the economy, improve the country's citizens and efficiency, productivity, increase them that has been proven to have the US economy on a positive will development and research (Eni Kaharti, 2017). The government must allocate sufficient research and development (R&D) budget so that each economic sector has the ability to innovate and produce goods and services to meet the needs of society. An increase in the research budget will have a positive impact on the US economy. Research and development has been proven to increase productivity, efficiency and improve welfare for the people of the United States, thereby increasing economic growth and creating new jobs.

However, current conditions show that the achievements of research and development (R&D) and national product innovation are still far from ideal. Based on data from the Ministry of Research and Technology Republic of Indonesia /National Research and Innovation Agency Republic of Indonesia, the national research and development (R&D) budget in 2023 reached Rp 2.2 trillion. This budget decreased by 57.4% compared to the previous year. The 57.4% decrease in the research and development (R&D) budget is a result of the merger of 34 research institutions into National Research and Innovation Agency Republic of Indonesia (Kementerian Riset Nasional, 2022). Concerns and negative impacts on national self-reliance, especially in the economic sector, will inevitably arise as a result of this decrease in the research and development budget. It is important to increase national self-reliance through research and development, especially to create new goods with high added value, improve the quality of existing goods, and reduce dependence on imported goods. Consequently, in the future, efforts should be made to increase the national research and development budget.

Based on the Global Innovation Index (GII), Indonesia ranks 61st out of 132 most innovative countries in the world with a score of 30.3. Indonesia lost to Malaysia and the Philippines. This figure puts Indonesia below Singapore (61.5), Malaysia (40.9), and the Philippines (32.2) (Crysanisa Suhartanto, 2023). There is a very wide gap between the current government research and development (R&D) budget allocation and the existing international minimum standards. Of course, this budget gap also has an impact on the low achievement of innovation and national product independence. Whereas there are literature and empirical studies that show a positive correlation between research and development (R&D) budget allocations with innovation achievements and state revenues (Pappiptek, 2022). Therefore, an increase in the national research and development (R&D) budget is needed to strengthen the system in the

latest innovation ecosystem so that Indonesia is able to produce many superior products made in Indonesia that can compete internationally.

This research uses the theory of national resilience related to the research budget to realize the national product independence program (Barry Buzan, 2018). There are 5 important sectors that can affect national resilience, namely Political, Economic, Social, Military and Environmental.

From the point of view of national resilience, this research recognizes the potential of increasing the research and development budget to encourage national product independence. The challenges and opportunities that will be faced when implementing government policies to generate benefits for the independence and sovereignty of Indonesia's essential products. National resilience theory is used in this research. Thus, it is expected to help the government increase the independence of national goods and reduce dependence on imported goods.

RESEARCH METHODS

This research uses a qualitative descriptive approach and literature review to identify opportunities to increase the research budget to improve the country's ability to produce its own national goods. This was done from a national resilience point of view. The secondary data collection method utilizes official reports, journal articles, and relevant government publications (J. Moleong Lexy, 2002). Data analysis was conducted on the current state of imported product dependence and domestic product innovation capacity to identify opportunities and constraints for enhancing national product self-reliance. In addition, analysis of selected secondary data was used to formulate useful policy recommendations. Since it is used for national product self-reliance from the point of view of national resilience and safeguarding technology strategy and industrial upgrading for policy development strategy takers, research can be conducted. (Sugiyono, 2013)

RESULT AND DISCUSSION

The nation's resilience and prosperity depend on the independence of national products. Currently, most of Indonesia's strategic products still depend on imported raw materials, based on findings from previous research. This dependency is highly vulnerable to external changes, such as geopolitics, global geostrategy, and global conflict (Sulaeman E et al., 2022). This dependence poses risks to strategic sectors and can threaten a country's survival and national strength. Therefore, to reduce dependence on imported products, the national research and development (R&D) budget must be increased.

Currently, the ability in the framework of Indonesia's strategic product independence is very low, around 30% for food needs, 95% for health, and 35% of defense equipment which until now still depends on imports, supported by previous research (Santoso H, 2020). The current condition is very prone to disrupt national resilience when facing shocks that can break the country's supply chain. Therefore, the country must increase its product independence through various policies that support national resilience. Of course, many efforts can be made by the government in increasing the independence of national products with two main approaches, namely import substitution and increasing the capacity to produce domestic products. Based on previous research (Tambunan T, 2021), Import substitution policy is a government policy to reduce import dependence by increasing domestic production. For example, high import tariffs make local products unable to compete. Currently, what is meant construction industry capacity

is the ability of the domestic industrial sector to produce certain types of products within a certain period of time. Innovation should be stimulated through national research and funding policies. A research budget is important for a country to produce strategic resources and increase the independence of domestic products that can compete with foreign products. So Indonesia does not depend on imports. The results of this study show that there is great potential for increasing the research budget to create new activities and produce national strategic products to increase household product independence and innovation power and encourage the speed of strategic actions. For fresh products at home. Based on previous research (Pappiptek, 2022), Using empirical studies in Singapore and South Korea, with an increase in the research budget in the country from 2-4% of gross domestic product (GDP), it is able to create many new innovations in producing superior products that characterize the region such as financial technology, semiconductors, and advanced transportation. This can certainly reduce dependence on imported products in these sectors. On the contrary, Indonesia's research budget is still very low at around (0.3%) of gross domestic product (GDP) per year. This has undoubtedly contributed to the lack of independence of national strategic products that are very important to the country, such as medical devices and agricultural technology (Kemenristek, 2021).

Looking from the other side, innovation to produce the latest products and create strategic technology. The domestic innovation ecosystem is still very weak, of course, this also contributes to encouraging the independence of domestic products. Domestic strategic products contribute to the manufacturing sector to gross domestic product (GDP) and the value has been relatively stagnant at 15% over the past decade, indicating that innovation and an increase in domestic production capacity are limited. This is supported by previous research (Muhammad Athar Ismail Muzakir et al., 2020). The dependence on foreign raw materials in the development of these prototypes produced through design, build and enrichment activities is still very high. Therefore, it is necessary to increase the availability of raw materials used in the country in order to increase the domestic component level of national products.

There is also previous research (Nurrika Chandra & Bayyinah Nurul Haq, 2020), discusses product innovation in the field of fashion. The results of this study show that the design of a satchel bag type leather bag that has 2 functions in 1 product, which can be used for handbags and sling bags. From these two articles, it can be concluded that product innovation can be done in many fields, such as technology and fashion, but there are still obstacles that hinder innovation and independence of domestic products, such as dependence on foreign raw materials and limited infrastructure and human resources. The manufacturing sector contributes to gross domestic product (GDP) with domestic strategic products, but its value has remained stagnant at 15% over the past ten years, indicating limited domestic innovation and production capacity. The absence of innovation in this ecosystem greatly impacts the very small or non-existent domestic production capacity. Therefore, efforts are needed to improve the availability of domestic raw materials, infrastructure and human resources.

According to (Barry Buzan, 2018), a country with good national resilience has the ability to maintain the independence of national products. This is influenced by 5 sectors, namely Political, Economic, Social, Military and Environmental. It can be said that the progress or decline in a country's national resilience depends on these 5 sectors. At the same time, by increasing the independence of national products through optimizing the research budget so that it can contribute a lot in maintaining the resilience of stable economic growth and public welfare to face threats that can break the supply chain of vital product needs of society.

The stability of food availability in a country is crucial for national resilience, which can have an impact on the country's social and macro-economy. This research is supported by previous research (Sharfina Widyandini, 2016), which shows that the economic, social and political stability of a country is highly dependent on its food security. As an archipelago,

Indonesia faces challenges in meeting its food needs. As a result, efforts must be made to improve food security in Indonesia by considering life expectancy, the percentage of poor people, and the percentage of households without access to electricity. As an archipelago, Indonesia faces challenges in meeting its food needs. As a result, efforts must be made to improve food security in Indonesia by considering life expectancy, the percentage of poor people, and the percentage of households without access to electricity. One of the empowerment efforts in utilizing existing yards to obtain sufficient food reserves, increase the diversity and quality of community food consumption to be more diverse, nutritionally balanced, and safe, is the Sustainable Food Home Area program.

Self-sufficiency is defined as when a country has the ability to meet its own needs and produce its own goods without relying on other countries. This improves national resilience, competitiveness, and people's welfare. To avoid relying on imports, self-sufficiency of national products must be maintained by increasing productivity, product diversification, increasing reserves, and new innovations. Therefore, it is crucial to optimize the country's research budget in various fields that produce strategic and important production. This is done to maintain the sustainability and welfare of society and to enhance the country's national resilience (Sharfina Widyandini, 2016).

In increasing the independence of national products when viewed from national resilience, of course, there are several challenges that must be faced, such as:

1. Budget limitations, being one of the main challenges in developing a research budget, can limit the ability to research to produce innovative products so as to increase the independence of national products when viewed in terms of national resilience. This is supported by previous research (Muhammad Athar Ismail Muzakir et al., 2020).
2. Infrastructure limitations, currently Indonesia in terms of infrastructure is inadequate, this can also be a challenge in developing a research budget (Kementerian Perhubungan RI, 2021), so the availability of adequate facilities is very important to conduct quality research.
3. Limited human resources, Indonesia currently has a very large number of Indonesian citizens, but these qualified human resources are a challenge in developing a research budget. (Hery Suliantoro et al., 2006), shows that the availability of adequate experts is essential to conduct quality research.
4. Limitations in accessing data, this is an obstacle in developing a research budget to produce innovative products. Adequate data availability is essential for conducting quality research (Muhammad Athar Ismail Muzakir et al., 2020).

It can be concluded that there are challenges that must be faced in developing research budgets such as budget limitations, infrastructure limitations, human resource limitations, and limitations in accessing data in increasing the independence of national products seen from national resilience. So that Indonesia does not depend in terms of production raw materials from abroad.

There is a significant increase in the research budget in order to increase the independence of national products, this is very necessary to strengthen the existence of a domestic innovation ecosystem. This is supported by previous research (Marbun D et al., 2021), researchers take from the experience of developed countries, in terms of increasing the basic and applied research budget, the results are very significant to encourage the acceleration of innovation of a product which of course can reduce dependence on imports. As in South Korea, the research budget was increased in the field of nanotechnology from \$9 million in 2001 and in 2012 to \$1 billion dollars. This resulted in significant contributions especially in the broadcasting of scientific publications and more than 2000 patents.

We know that currently Indonesia is in the recovery phase of the Covid-19 phenomenon, the majority of our medical device products at that time were imported from other countries, it

certainly affects Indonesia's national resilience. While for agricultural technology in Indonesia is currently experiencing a food crisis, according to data from Central Bureau of Statistics of the Republic of Indonesia the value of food imports in Indonesia in 2023 reached 38.24 billion US dollars, including staple food commodities. And the value of domestic food production amounted to 3.50% US dollars (Badan Pusat Statistik, 2023). Thus, the level of productivity and production capability of a number of domestic food strategy products is still very limited and has not been able to meet domestic demand. So this has encouraged Indonesia to be self-sufficient in food imports until now.

Based on the results of empirical studies, there is a positive correlation with the amount of domestic research investment, so that the achievement in producing the latest product innovations can reduce dependence on imported products and certainly have a positive impact on national resilience in Indonesia. Therefore, it is necessary to increase the research budget to 1-2% of gross domestic product (GDP) in the Strategic Plan of the Ministry of Research and Technology Republic of Indonesia /National Research and Innovation Agency Republic of Indonesia, this Strategic Plan is a guideline in the implementation of national development in the field of research. The Strategic Plan was developed by considering the various challenges and opportunities faced by Indonesia in the field of research and development (R&D). Supported by previous research (Aminullah, 2020), to accelerate the achievement of the independence of strategic products and domestic technology, the 2025 the Strategic Plan of the Ministry of Research and Technology Republic of Indonesia /National Research and Innovation Agency Republic of Indonesia is very important. It is expected to achieve and trigger the down streaming of innovative research results conducted by the State-Owned Enterprise of the Republic of Indonesia and national corporations so that they can contribute to the development of new innovations. Thus, it has a positive impact, namely reducing imports of strategic goods and increasing the added value of Indonesia's innovative goods exports.

With a national research and development budget of more than 2% of gross domestic product (GDP), Indonesia certainly has a great opportunity to increase national product independence through the accumulation of research commercialization results of strategic and vital products for Indonesia such as developing vaccines, which would have high prospects if developed by Indonesia itself, rather than imports. Overall, if the research budget is increased, it will contribute significantly to national resilience and independence of vital products to reduce the vulnerability of the country's supply chain to global shocks.

The implementation of research budget optimization is an important step in ensuring the effective and efficient use of the research budget. This is supported by previous research ((Natta Sanjaya, 2019), and employee performance. Shows that the application of research budget optimization can have a positive impact, such as improving service quality, community welfare programs, development, In addition, the application of research budget optimization can also assist in increasing local revenue through the management of regional property.

To maximize the potential of increasing the research budget, new policies are needed that support government programs, such as increasing the independence of national products and strengthening Indonesia's national resilience conditions. (Ermayani D, 2021), here are several policies that can support this, such as revitalizing research incentive schemes that are oriented towards creating the latest innovations so that they can produce strategic products with long-term funding schemes. Then there is a regulatory relaxation policy which encourages investment in the private sector into the commercialization of research results carried out by the State-Owned Enterprise of the Republic of Indonesia, and an increase in triple helix collaboration between academics, industry and government. This is done to accelerate the transfer of research technology to domestic innovative products.

With the right combination and policy formulation, domestic product independence will be encouraged. This increase in the national research budget by 2% of gross domestic product (GDP) has the potential to significantly accelerate the country's strategic product self-reliance capability. Thus, in the next five to ten years, there will be a significant reduction in the amount of essential imported goods. In addition, it can drive industrial growth and product innovation in the country. As such, the result will improve the resilience and economic well-being of the Indonesian nation and reduce the risk of external disruptions that could disrupt supply chains in the future. (Kementerian Riset Nasional, 2022).

CONCLUSION

It is important for Indonesia to improve its national resilience by increasing its research budget and developing innovative products to produce self-reliant products. There is a potential impact if the research budget is increased by 2% of gross domestic product (GDP) per year on national product independence and strategic national resilience. The important role of national productive independence when viewed from a national security perspective with the right target has the potential to reduce the current dependence on imported products, especially in vital sectors such as health, food, and defense. This will pose a risk to national security in the future. In this case, there are challenges and opportunities that must be faced increasing national product independently. An improved research budget is positioned as a critical success factor in national resilience by providing potential economic and strategic benefits, including to reduce import dependency and increase the contribution to national gross domestic product (GDP) from innovative industrial products.

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