

RESEARCH

Tax Incentives and Fiscal Support to Encourage Innovation and Technological Advancement: A Comparative Study

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Abstract

Human resources and technology are the greatest capital of a nation at this time. Innovation and technology as a driving force of growth requires investment in enormous amount. Studies show that tax incentives and fiscal support contribute significantly to the level of investment in research and development. The varying forms of tax incentives and fiscal support results in different impact on the development of technology and innovation. This study aims to conduct a comparative study of the various forms of tax incentives and fiscal support for research and development as well as provide recommendations on the suitable form of tax incentives and fiscal support to be implemented in Indonesia. Methodology used in this research is literature study by using descriptive analysis. There are broadly three forms of tax incentives and fiscal support given in various countries, namely: (i) super deduction; (ii) tax credit; and (iii) direct subsidy. The results of this study indicate that Indonesia needs to take aggressive measures in encouraging innovation and technology to improve global competitiveness. To support these measures, an aggressive tax incentives formulation is also required in the midst of the competition and to keep pace with other countries in the region. Tax incentives given need to be focused on the areas where Indonesia has comparative advantage.

Keywords: tax incentive, fiscal support, research and development, global competitiveness, comparative advantage

1. Introduction

Indonesia experienced a rapid growth in the last decade. It can be seen from the increase of gross domestic product (GDP) per capita. In 2004, Indonesian GDP per capita (based on the constant price in 2000) was IDR 7,561,379.61. In ten years, the value has increased to IDR 11,134,017.58 or about 52.73%. The growth rate of GDP has reached 5.76%, higher than the economic growth of the United States, Europe and Japan in similar period. Even after the global financial crisis in European and American continent, affecting all over the world, Indonesian economy still grew 4.63% in 2009.

Regardless the aforementioned joyful fact, Indonesian economy is facing the threat of middle-income country's trap or better known as middle-income trap (Tho, 2013). Middle-income trap is a situation in which the growth of a country slows after reaching the middle-income level (Global Economic Symposium, 2014). The transition to high

income level is apparently inaccessible. Empirical study shows that usually the growth rate of GDP per capita slows down substantially at the level of income between 10,000 USD and 15,000 USD. The slowing growth can be related to the loss of factors producing high growth during the initial phase of rapid growth. International competitiveness declines, while the output and growth slowdown.

Human resources and technology are the required capitals to escape the middle-income trap. Based on the experiences of advanced countries facing industrialization since 250 years ago, technological innovation has been proven as the encouragement for economic growth (Janeway, 2013). Sustainable growth to high-income level should be marked by the relative abundance of human resources and technology and managerial availability. Middle-income country is trapped between poor countries with low wage labor yet mature industrial mastery and wealthy countries as the innovators who dominate the rapid industry of technological change.

Investment in research and development sectors is a significant encouragement for innovation and technological advancement. Complete involvement from the government and private companies is absolutely required to fulfill the need of the strategic investment. The government's contribution in funding the research and development activities is limited in scope and impact. It is because of the limitation in budget and several regulations. Therefore, the active role of private sectors is expected to be dominant in investing for research and development sector. In this case, the role of the government is demanded to create supporting investment climate so that investors are interested to invest in the sectors.

The support expected from the government to encourage private investment in research and development sector is exemplified in the form of fiscal incentive, providing tax convenience and reassurance in various schemes. In addition, the support from the government can be given in the form of direct support (cash grant) for institutions conducting research and development by forming partnership with the private parties. The involvement and active role of the government are expected to be the catalyst in motivating the innovation growth and advancing the technology to encourage the economic growth.

On the map of global innovation and technology, Indonesia is still far behind many countries in Asia, even most of countries in Southeast Asia. Research budget in Indonesia is stagnant in the last ten years. The ratio between research budget and gross domestic product does not change exceedingly. The ratio of the research budget is only 0.08% of GDP. Meanwhile, according to the Head of Indonesian Institute of Sciences (LIPI), Lukman Hakim, for a country that successfully develops its economy, the ratio of the research budget should be minimally 1% of GDP (Kompas, 2014a). Chinese research expenditures reach 1.9% of GDP; South Korea even reaches 3.74% (World Bank 2014). In the case of publication of researches in journal, Indonesia is far behind Singapore that has published 4,543 articles in the international journal. Indonesia has published only 270 articles in the international journal. For high-technology-based export, Indonesia is far behind Singapore, Malaysia, Thailand, and even Philippine.

The Judge in Kompas (2014a) opines that there are three obstacles hindering the growth of research, namely institutional problems, the limited researchers, and monetary & fiscal policy that does not side with researchers. The last obstacle includes low tax incentives and fiscal support towards activities in research and development sector. Therefore, Indonesia needs to take an aggressive step to encourage innovation and technological

advancement. Considering the importance of tax incentives, the government should plan aggressive schemes for tax incentive and fiscal support as well.

This research aims to conduct comparative study towards several forms of tax incentives and fiscal support towards research and development as well as to recommend the proper tax incentive and fiscal support to be implemented in Indonesia. Each country implements different strategy and policy to encourage innovation and technological advancement through research and development activities. Several countries implement a wide tax incentive policy to encourage private role in research and development activities, meanwhile the others opt to focus on certain business sectors and fields. Indonesia can take advantage of the experiences of advanced countries to plan the scheme of tax facilities to encourage research and development activities.

2. Theoretical Framework

As described earlier, innovation and technological advancement is an economic driving force to escape the middle income trap. To put it simply, innovation can be understood as a discovery of new knowledge; while technology can be explained as a way to utilize the knowledge. In the legal context¹ (according to Law No 18 Year 2002), innovation is defined as "the activity of research, development, and/or engineering aiming to develop the practical application of the value and context of the new knowledge or a new way to apply the available knowledge and technology into products or production process". The Law also includes the definition of technology as "a way or a method as well as a process or a product produced from the application and utilization of various sciences that produce the value for the fulfilment of needs, sustainability and improvement of the quality of the human life."

The key to successful innovation and technological advancement is the flourishing of research and development activities. The awareness of the importance of research and development sector in supporting the advancement of a country encourages the government to provide support and stimulus. From legal aspect, Law No 18 Year 2002 has provided a room for government's support for the development of technology and innovation. Article 21 (3) from the Law stipulates that providing incentives is a form of policy instruments, developed by central government and local government as a form of support and convenience that can encourage the growth and synergy of all elements of National System of Research & Development, as well as Application of Science and Technology.

¹ Law No 18 Year 2002 regarding National System of Research and Development, as well as Application of Science and Technology

There are several reasons why the government supports research and development activities conducted by the business world. First, research and development activities are seen as a crucial investment for long-term economic growth. Based on the results of the research conducted by the members of OECD (OECD 2010), the increase of productivity is highly related to the increase of research and development activities conducted by the government and private institutions. The intensity of research and development activities in those countries and their growing performance is related to the research proportion funding from private sectors.

Second, research and development activities funded by private sectors can maintain employment, particularly during economic crisis. The involvement of the government can make a difference between success and failure of the business. For instance, to aid a company in facing financial crisis, several countries have provided temporary yet wider fiscal incentives for research and development activities, such as expanding the criteria to meet the requirements of obtaining tax credit (such as in Japan and Netherlands), giving the leniency for the time period to carry forward the unused tax credit to the following years (Japan), or shortening the time period of returning the credit (France).

Third, the involvement of private sectors in research and development activities contributes to the increase of national competitiveness. In the world where multinational companies' research and development activities globalize exceedingly, governments also competes in attracting the attention of those companies in order to seize the opportunity to have the R&D activities conducted in their country. Wide incentives through tax incentives for research and development activities can make a country a relatively more interesting location for investment in research and development sector compared to the competitor countries.

Fourth, investment in research and development sectors has a high risk. Only few research and development projects will produce new products or processes that can be marketed, and it often happens after long period of time without uncertain returning period. In addition, it is difficult for financial institutions to value the quality of an investment in research and development sector due to the high uncertainty and the reluctance of the company to reveal relevant information. For that reasons, companies, particularly small and beginner companies, tend to have trouble in obtaining the credit for the investment in research and development sector.

Fifth, research and development activities result in public goods. Knowledge goes out to other companies and organizations that do not bear the investment cost. Since the investing companies will

not be able to gain all benefits from their investment, those companies tend to do less investment than socially optimal investment. The risks contribute to the larger gap between research and development expenditures and the desire to reach the innovative level required for the advancement of a country.

The government can choose among various available instruments to encourage the involvement of private parties in research and development. The government can offer direct support through cash grant or cash provision or through fiscal incentives such as tax incentives for research and development. Cash grant/direct subsidy for research and development can target certain projects with high social effect; meanwhile the tax credit will reduce the marginal expense caused by the expenditures of research and development sector and give an opportunity for private companies to choose which project they will fund.

Each country has its own preference in providing direct or indirect support. The United States (through competitive research and development contract) and Spain give more priority to direct support, meanwhile Canada and Japan give indirect support more dominantly to accelerate research and development activities (OECD 2010). Optimal balance between direct and indirect support towards research and development activities is different from a country to another country, since each instrument improves different market failure and stimulates different research and development. On one side, tax credit for research and development is not only provided for certain project or company group, but also for all parties with the potentials to conduct research and development. Therefore, the incentive is neutral towards the type of industry, region or company. On the other side, cash grant can be provided for certain project, based on the consideration that the government has high social return level and depends more on the discretion of the government's policy. Generally, tax credit is highly provided for encouraging short-term applied research; meanwhile direct subsidy is provided for encouraging long-term research.

Compared to the last decade, there are more countries today that utilize tax incentives with wider and looser schemes. Up to 2010, based on the study of OECD (OECD, 2010), there were more than 20 countries of OECD's members giving fiscal incentives to encourage the sustainability of research and development conducted by business world. The number had increased from 12 countries in 1995 and 18 countries in 2004. Of the countries having no tax incentive for research and development, Germany and Finland are still considering to provide incentives.

Non-OECD countries such as Brazil, Chinese, India, Singapore, and South Africa also provide friendly and competitive tax climate for investment in research and development sector. Chinese gives

some deduction of general tax for companies running in research and development sectors located in certain new technological area or investing in key sectors such as biotechnology, information and communication technology, and other high technology sectors.

General tendency among OECD countries is to adjust the tax incentive for research and development to be looser and simpler to utilize. For example, France (in 2008) and Australia (in 2010) changed the old complex and increment-based incentive scheme into a simpler and looser volume-based scheme. In last years, Belgium, Ireland, South Korea, Norway, Portugal and England had improved and lengthened provision of tax credit or limitation for research and development expenses. Canada has introduced a new administrative requirement to provide a convenience in accessing tax credit for research and development programs and improved the consistency and predictability and the quality of claim process.

Contrary to the general tendency, Mexico and New Zealand had stopped giving tax credit. In 2009, Mexico changed tax credit for research and development into direct support. In 2008, New Zealand introduced tax credit for research and development but it was stopped a year later.

To aid companies in addressing financial crisis, several countries has provided looser yet temporary fiscal incentives. For example, Japan and the Netherlands has increased the maximal limit of research and development expenses that can be claimed temporarily. Japan also gives longer carry-forward time period for tax credit for unused research and development because of the awareness that several companies are not in the position to claim the whole tax credit for research and development for several years ahead due to the decline of profit experienced by companies in Japan. In 2009, France returned all delayed claims from previous years. Before 2009, a company should wait up to three years before obtaining the return of the unused tax credit. With that scheme, a company would obtain the return of the unused tax credit obtained three previous years. The policy was expected to increase the lost tax income up to 6 billion USD in 2009 (0.29% of GDP).

3. Research Method

Methodology used in this research is literature study using descriptive analysis. The research is conducted by exploring the implementation of tax incentives and fiscal supports for research and development activities in several reference countries. There are broadly three forms of tax incentives and fiscal support provided in various countries, namely: (i) super deduction; (ii) tax credit; and (iii) direct subsidy. Here in after, an analysis is conducted towards the various forms of incentives and the

condition of research and development sector in Indonesia as well as its potentials. The analysis will result in recommendations on the policy of tax incentives and fiscal support for research and development activities in Indonesia.

4. Results and Discussions

This research aims to observe several countries to be references in formulating a policy regarding the fiscal support provided by the government for research and development sectors. There are four countries chosen, all of which are superior in the innovation and technological advancement. Several indicators used to select the reference countries are as follows: (i) the budget spent for the expenditures in research and development sector; (ii) the scope of incentives provided; and (iii) the alignment towards the development of research and development in certain sectors or business group.

India is chosen as one of the references since the country provides wide incentives to develop its research and development, including direct tax incentives, indirect tax, as well as regional incentives. The United States is chosen since it is a country with the biggest expenditure for research and development sector, approximately USD 405.3 billion in 2011 or 2.7% of its GDP. England is selected since the country shows the actual alignment to support SMEs sector in research and development. Germany is selected since the country provides different fiscal support compared to other countries, by providing cash grant in a large amount. Tax incentives and fiscal support of each respective country will be explained as follows:

India

The government of India offers interesting incentives for research and development activities. The incentive includes super deduction for research and development expenses for manufacturing companies, contribution provided to research institutions, exemption of import duties for certain capital goods, etc. (Deloitte 2011).

Direct tax incentives

Available direct tax incentives based on Income Tax Act can be categorized as follows:

- a. Incentives for research and development expenses requested by applicant conducting business-related of research and development activities. The incentive is provided in the form of super deduction for 100% revenue and capital expenses (except the expense of land acquisition) issued or funded in business-related scientific research.

To obtain the above incentives, the expense spent should meet the criteria of "business-related scientific research" as defined by the Law.

- b. Incentives for manufacturing companies conducting research and development activities. The incentive is provided in the form of weighted deduction for 200% of in-house research and development expenses, including the expense of capital (except land and building) spent by the manufacturing companies. According to the regulation in The Direct Taxes Code Bill effectively valid since April 1, 2012, the utilization of the incentives is not limited for manufacturing companies anymore, but for all industries.

If some expenses meet the requirements to obtain this incentive, the expenses cannot be claimed as expenses anymore. The weighted deduction is provided in the form of net. Realization of sales, cash grant, donation, sponsorship funds for research and development center should be deducted from research and development expenses.

With such incentive, India has joined the countries that also provide 200% weighted deduction, like Singapore, Hungary, and Malaysia. The incentive is only provided when the related research activities are conducted in India and the expenses are spent in India as well.

- c. Contribution for research and development activities. The incentive is provided in the form of deduction for 125% to 275% of the contribution provided for the association of scientific research, university, academy, or other institutes used for scientific research.

The 175% weighted deduction is provided for the applicant for each contribution by each person to the association of the research aiming to conduct a scientific research or to the university, academy, or other institutions used for scientific research.

The 125% weighted deduction is provided for the applicant for each contribution by each person to the association of the research aiming to conduct social research or statistical research. This regulation is renewed with The Direct Taxes Code Bill in which the weighted deduction incentive is broaden into 175%.

The 125% weighted deduction is provided for the applicant for each contribution provided for the companies used for scientific research by meeting the requirements.

The 200% weighted deduction is provided for the applicant for each contribution provided for national laboratory, university, technological institution or certain people with specific direction whose contribution will be used for scientific research, conducted in a program that has been approved by authoritative institution.

- d. Accelerated depreciation. The incentive in the form of 40% accelerated depreciation is allowed

for the factory and machines used in goods manufacturing, using certain technology from India except those excluded from Eleventh Schedule list. The normal depreciation is 15%.

Accelerated depreciation is provided for goods manufacturing and production that meet the requirements as follow: (i) manufactured or produced by technology (including each process) or other know-how developed in India, or (ii) found in a laboratory owned or funded by the government, or a laboratory owned by public sector company or university or institution that has been approved by the authoritative institution.

Indirect tax incentive

Indirect tax incentive is categorized into three sections:

Section I: Incentives for in-house research and development

1. Export Promotion Capital Goods (EPCG) Scheme

With this scheme, the provision of capital goods for pre-production, production, and post-production activities can be charged by lower import duty with export commitment for the manufactured products. Service providers, exporters of manufacturing companies, or exporters of trading company bonded by manufacturing companies that support them, who conduct in-house research and development activities, can import capital with 0% or 3% tariff or provide capital goods domestically by obtaining duty-free facility. Companies utilizing this scheme should fulfill the obligations as regulated.

2. Exemption of import duty for certain goods imported for research and development.

Listed companies based on the requirements can import certain goods to be used in research and development activities in pharmaceutical and biotechnological sectors with 0% or lowered tariff 5% of the import duty, depending on the characteristics of imported goods.

3. Exemption of import duty for manufacturing companies in agrochemical sectors

Manufacturing companies in agrochemical sectors exporting 200 million rupees in minimum in the previous year and owning research and development units listed according to the requirements can be provided with the exemption of import duty for certain goods imported for research and development purposes that meet the requirements.

Section II: Incentive for conducting research and development activities as collaborative work

The exemption of general and additional import can be provided for equipment, instrument, raw material, component, pre-printing machine, and computer software imported for research and development projects. The exemption is limited only when the funding is done by a relevant institution that meets the requirements.

Section III: Incentive for research and development activities conducted by other parties

1. Served From India Scheme (SFIS)

Companies of India that become the service providers obtaining revenue at least 1 million rupees in foreign currency in the previous year are entitled to obtain credit coupon of import duty. The credit coupon is equal to 10% foreign currency obtained during the year.

Services that meet the requirements to be provided with the facility are research and development services in science or social and humanity sectors or interdisciplinary research and development services.

The credit coupon of import duty can be used to obtain: (i) free import duty for capital goods import as well as the parts and equipment, and (ii) free duty for the provision of domestic capital goods as well as the parts and equipment.

Imported goods as well as the credit coupon of import duty should be used as its designated purpose and cannot be transferred.

2. Export Promotion Capital Goods (EPCG) Scheme

The scheme is also provided for research and development activities conducting by other parties.

3. Exemption of import duty

This incentive, provided for in-house research and development centers, is also valid for research and development activities conducted by other parties. It is similar to the incentive provided for research and development activities conducted collaboratively. Deduction of import duty to 5% and exemption of additional import duty are provided for scientific and technical instruments, materials, equipment, parts, living animals (for experimental purposes), computer software, and prototypes.

4. Exemption of excise duty

Exemption for all goods subjected to excise produced in technical, educational, and research institutions regarding an implementation of an experiment or research, is provided if the requirements are met.

Exemption of excise duty for goods produced by companies, fully owned by India, that are designed and built by national company, national

laboratory, research institution funded by public or university, is provided if the requirements are met.

Exemption of excise duty is provided for purchasing scientific and technical instruments, materials, equipment, parts, computer software, and prototypes. This incentive is provided for research institutions, university, Indian Institute of Science, Bangalore or Regional Engineering College.

Initiatives of the local government

The local government also plays a role by taking initiatives in providing incentive for encouraging the development of research and development sectors based on the superiority of each region. The initiative is generally arranged in the form of industrial policy and a comprehensive incentive package. The local government of Karnataka established industrial policy 2009-2014 including the development plan for research and development centers by providing subsidy and tax exemption. The local government of Tamil Nadu established the similar policy earlier in 2007 with similar target. Gujarat with a comparative advantage in agroindustry sectors established agroindustry policy in 2000 and improved it by establishing biotechnology policy in 2007-2012. Similar action has been conducted as well by the local government of Maharashtra, a region superior in biotechnological sectors. On other side, the government of Andhra Pradesh makes a commitment to develop its superiority in information and communication sector. Each region provides a very wide incentive for business participants who want to invest in research and development sector in their region.

The United States

The government of the United States provides tax incentive in the form of tax credit. Tax credit is supplied for research expenses that meet the requirements, in which the tax credit is deducted from federal income tax and state income tax (Deloitte, 2013). The government provides two methods of calculation for tax credit in 2011:

- a. 20% credit: 20% traditional tax credit of expenses exceeding the basic amount, credit calculation with this method is complicated; or
- b. 14% credit: an alternative for simple credit calculation by 14% tax credit incentive of the difference of research expenses that meet the requirements and 50% of average research expenses in previous three years.
- c. Other tax incentives are particular credit for fundamental researches (researches conducted in a university), payment for research consortium in energy sectors, and research in orphan drug (raw

material of pharmacy developed particularly for rare medical condition treatment) sector.

The government of the United States offers tax credit to offset tax obligation in this period, the previous period, and the next period. The unused tax credit can be carried back for 1-year period and carried forward for 20-year period. For small companies with gross income less than USD 50 million are provided with concession with 5-year carry back and 20-year carry forward. The tax credit distribution does not apply a maximum limit. Generally, tax credit for a research cannot be cashed. However, in a very limited condition, taxpayers can obtain refund for tax credit carried forward before 2006 as the substitute of taking depreciation bonus (period of 2008-2009).

The incentive is meant to give convenience for all industries conducting researches that meet requirements. In other words, all industries should meet all requirements to obtain tax credit for research activities. Expenses that can be included in obtaining tax credit are as follows: the salary of internal labors, 65% of contract labor, and equipment used in the research process. Overhead expenses and capital expenses are excluded.

No regional limitation in which intellectual property takes place. Activities that meet the requirements should be conducted in the region of the United States and related expenses should be spent by taxpayers of the United States (even though the expenses might be changed by foreign affiliation companies).

England

England offers two volume-based incentives: first, the incentive provided for the companies that meet the definition of small and medium enterprises (SMEs), and second, incentive provided for the companies that do not meet the definition (large companies) (Deloitte 2013). Generally, small and medium enterprises should have less than 500 employees and gross income less than 100 million euro as well as gross asset less than 86 million euro. Usually, affiliated companies are considered in determining whether a company meets the definition of SME or not.

Tax facilities provided:

- a. For large companies: 130% super deduction;
- b. For SME: 225% super deduction; and
- c. Cash credit: provided for SME suffering a financial loss, about 24.75% of expenditures that meet the requirements.

Unused tax incentive can be carried forward for infinite period of time to be deducted from the future profit coming from similar trading under the condition that there is no change in ownership and trading property in three years. At this moment,

there is no maximum limitation of the amount of research and development expenses that can be deducted for large companies. However, there is a maximum limitation for tax incentives provided for SMEs, about 7.5 million euro for each research and development project. Capital expenditures are excluded from super deduction, but full deduction for capital goods used in research and development activities can be claimed in the year the expenditures take place; not amortized for tax calculation according to the general requirements.

Patent Box regime allowed companies to submit low tariff for corporate income tax from the profit obtained from a discovery patented, and certain innovation. Such dispensation was implemented on April 1, 2013 and the tariff for income tax was changed into 20-24%. The incentive is unrelated to the type of the industry. The qualification is based only on the property of the activities conducted. Companies can submit a claim to obtain the incentive for their expenditure expenses if they meet these requirements:

- a. Employ those who actively and directly conduct research and development;
- b. Pay the service provider of employee to employ those who actively and directly conduct research and development (limited to 65% of total cost);
- c. Raw materials processed that are used directly in conducting research and development;
- d. The costs for energy, water, fuel, and computer software used directly in conducting research and development;
- e. SMEs can claim 65% of subcontract-related expenses. Large companies can claim subcontract expenses only when they are paid to universities, health authorities, charities, scientific research organizations, individual, or partnership between individuals
- f. Pay the volunteers participated in clinical experiments

Other expenses related to land, patent and patent protection are excluded. Large companies can submit a claim on the expense return related to the work contracted to the company as long as the work is contracted by large companies or other parties who are not English tax subject.

Germany

Incentive provided by the government of Germany for research and development activities is in the form of cash grant with no obligation to repay (Deloitte, 2013). The incentive is provided based on the project, often collaborative project. No legal claim given to the funding of research and development activities. The percentage of cash grant can reach 50% of approved project cost. Higher percentage can be provided for the project conducted by the actors of small and medium enterprises. The criteria of choosing the appropriate project in order

to obtain the incentive: (i) innovation level; (ii) technical risk level; and (iii) economic risk level.

Besides the cash grant, the government also provides support in the form of loan as the alternative funding for research and development activities. The loan provided for research and development does not depend on research and development activities in certain technological sectors and does not have deadline for submitting. The loan is provided through governmental program different to cash grant. The government of Germany has not provided tax incentive for research and development activities; however, the incentive has been introduced into the political agenda.

The right to obtain financial support is not limited to particular industries. Companies within these industries often request a cash grant: (i) biotechnology and biology; (ii) information and communication technology; (iii) manufacture; and (iv) energy and utility. However, several industries often excluded from obtaining financial support are: (i) bank and financial service companies; and (ii) insurance companies.

The expenses that can be funded from cash grant or loan include: labor wages, raw materials, overhead costs, subcontract costs, amortizations, and travel expenses. Generally, a cash grant is provided for covering expenses spent. The activities that meet the requirements to obtain the funding are as follows:

- a. fundamental research – experimental or theoretical work aiming to obtain new knowledge;
- b. industrial research – a research with specific practical objectives intended to develop new products, processes or services or to improve existing products, processes or services; and
- c. Experimental research – a research aiming to produce drafts, plans, or prototypes.

Research and development activities and the expenses should be conducted and spent in Germany. The exploitation as the result of the project, including intellectual property rights, should occur in Germany as well.

Indonesia

Available incentives at the present

Reflecting on the experiences of other countries, Indonesia is still far behind in providing tax incentives and fiscal support for research and

development activities. The requirements regarding tax incentives are scattered in various levels of legislation, either Government Regulation or Regulation of the Minister of Finance. This situation hinders those conducting research and development from obtaining complete information. Due to the incomplete information, various available tax incentives look less interesting since the advantage that can be obtained is considered insignificant. In fact, those tax incentive facilities are still not widely used by those conducting research and development activities.

If analyzed further, tax incentive provided is still very limited, even it can be said that the government is still thrifty in providing the facilities. Related to the income tax facilities, the incentive provided is in the form of additional 1 year period for compensating the losses spent for domestic research and development activities regarding the development of products or production efficiency at least 5% of investment in 5 years². The income tax facility is a part of incentive for domestic taxpayers, investing in certain businesses or regions. The Government Regulation also regulates that the Income Tax facility as mentioned can be used after the Taxpayers realize at least 80% investment plan.

In addition, the government also provides incentives in the form of deduction allowed to certain amount of gross income regarding the calculation of taxable income. The deduction to certain amount is allowed for donation regarding research and development activities, particularly those conducting in the region of the Republic of Indonesia and given through research and development institutes³. For the implementation⁴, the regulation stipulates that the requirements for the donation to be deducted from the gross income are: (1) The Taxpayers having fiscal net income based on Annual Income Tax Return of the previous Tax Year; (ii) the donation and/or the fund not causing any loss on the Tax Year in which the donation is given; (iii) supported by valid proof; and (iv) the institution obtaining the donation and/or the fund has Tax Identification Number, except the institutions excluded as tax subject as regulated in the Law on Income Tax.

Another available form of tax incentives for research and development activities is the exemption of import duty and excise for imported goods for research and development purposes. Imported goods that can obtain the facility are those for research and development for scientific purposes or goods

² Article 2 paragraph (2) letter d number 4, Government Regulation No 1 Year 2007 regarding Income Tax Facility for Investment in Particular Sectors and/or Regions, as last amended by Government Regulation of the Republic of Indonesia No 52 Year 2011

³ Article 1 letter b, Government Regulation No 93 Year 2010 regarding National Disaster Donation, Research and Development Donation, Educational Facilities Donation, Sports Development Donation, and Expenses for Development of Social Infrastructure that Can be Deducted from Gross Income

⁴ The Regulation of the Minister of Finance No:76/PMK.03/2011 regarding the Procedures for Recording and Reporting of National Disaster Donation, Research and Development Donation, Educational Facilities Donation, Sports Development Donation, and Expenses for Development of Social Infrastructure that Can be Deducted from Gross Income

intended to develop sciences, including the researches aiming to improve the existing knowledge⁵. Related to imported goods, in addition to the exemption of import duty and excise, the government also provides incentive that is not deducted from the income tax as with regard to article 22 on goods for research and development purposes in science sectors⁶.

Specifically, excise exemption can be provided for ethyl alcohol with the lowest concentrate of 85% used for research and development for scientific purposes⁷. To obtain the excise exemption, manufacturer, manufacturer of storage, manufacturer of storage for mixing, or importer, should submit application to the Minister of Finance c.q. the Director General through the Head of Supervisory and Services Office of Customs and Excise. The application is submitted based on the request of the official institutions running in research and development for science sectors by including the details of the amount of ethyl alcohol requested for the excise exemption and its utilization.

The institutions owned by the government and run in research and development sectors can use the incentives in the form of excise exemption. The incentive is valid for goods imported for public interest by the Central or Local Government⁸. To obtain the exemption of import duty for those imported goods, the Central Government, the Local Government, or the third parties should submit the application to the Minister of Finance c.q. Director General of Customs and Excise.

The potential of providing those various tax incentives for the innovation and technological advancement is seen when they are compared to each other, for example, the exemption of import duty and excise for goods imported for research and development purposes. The incentive is provided for giving convenience for research and development institutions to import the required goods for conducting their activities. Therefore, it is possible that the incentive can improve the import of goods from other countries to Indonesia.

Furthermore, research and development activities in Indonesia will depend on the supply of imported goods, such as raw materials, equipment, parts, or prototypes or designs. If it continues in a long term, it will be contra-productive for the effort to improve the quality and quantity of research and development originally from Indonesia.

Policy Recommendations

Based on the aforementioned considerations, the government should make a policy plan regarding tax incentives and fiscal support for research and development activities using proper instruments for proper purposes as well. What is needed is an incentive capable to stimulate domestic research and development activities as well as encourage the utilization of the result of research and development activities to fulfil the need of not only domestic market but also global market. Therefore, we need to improve the management in sectors that become comparative advantage or competitive superiority for Indonesia.

To organize a policy regarding tax incentives and fiscal support for research and development activities, we need to have harmonious perspective from various stakeholders. The parties involved in the formulation of the policy are demanded to have a mindset that incentive is not mere expense for state finance when seen from the loss of potential tax revenue. On the contrary, the provision of incentives for research and development activities should be seen as an investment: that by providing incentive and fiscal support, research and development activities will increase. When research and development activities increase, the productivity will increase as well, and gradually the domestic additional value will increase. Therefore, the continuously growing basis of taxation will produce tax revenue that increase sustainably.

The harmony in perspective is also absolutely needed in the implementation of the policy regarding the provision of tax incentives and fiscal support for research and development activities. The institutions having a role in formulating the policy should have similar perspective to the perspective of the institutions conducting the operational provision of incentives. In practice, both institutes might have different objectives. On one side, the institute formulating the policy intends to increase investment in research and development sector by the provision of tax incentive and fiscal support. However, on the other side, the tax institute is concerned to keep the taxation potential optimal to produce state revenues. Since both institutes are under the Ministry of Finance, a strong leadership from the Ministry of Finance or even the President as the leader of the highest governmental leadership is needed to ensure the success of the policy.

⁵ Article 1 and 2, the Decree of the Minister of Finance No 143/KMK.05/1997 regarding the Exemption of Import Duty and Excise for Imported Goods for Research and Development for Scientific Purposes as amended several times with the Regulation of the Minister of Finance No 51/PMK.04/2007

⁶ Article 3 paragraph (1) letter b number 5, the Regulation of the Minister of Finance No 154/PMK.03/2010 regarding Collection of Income Tax Article 22 with Regard to Payment on Delivery of Goods and Import Activity or Other Business

⁷ Article 5, the Regulation of the Minister of Finance 47/PMK.04/2007 regarding Excise Exemption

⁸ Article 2, the Regulation of the Minister of Finance No 163/PMK.04/2007 regarding the Provision of Import Duty Exemption for Goods Imported by the Central Government or the Local Government Intended for Public Interest as amended with the Regulation of the Minister of Finance No 28/PMK.011/2011

By referring to the data from World Development Indicators as mentioned before, Indonesia needs to catch up on other countries, by regulating aggressive policy on the provision of incentive and fiscal support. The followings are several recommendations regarding the draft for the policy on tax incentive and fiscal support to encourage innovation and technological advancement.

1. Incentives prioritized for agro-industrial sector that become comparative advantage for Indonesia

The ability to increase sustainable economic growth depends on the ability to increase the innovation. Innovation based on the capitalization of research and development products will give direct impact on the improvement of sustainable productivity that eventually will accelerate the economic growth. The improvement of productivity towards competitive superiority will be reached along with the effort to strengthen the ability of innovation-based human resources.

The economic legacy based on natural resources that focuses on labor intensive needs to be gradually increased into skilled labor intensive and then into human capital intensive. The increase of the ability of human capital mastering technology and innovation is highly required when Indonesia enters innovation-driven economies. In this regard, agricultural sectors absorbing about 46% of total labor have a large potential to be improved to increase the productivity. Furthermore, the increase from factor-driven economy into innovation-driven economy needs to be applied in agricultural sectors as agroindustry.

To put it simpler, agroindustry is defined as an industry, giving additional value on agricultural product in a broad sense including sea products, forest products, agriculture and fishery (Indopuro, 2014). Agroindustry has a strategic role in fulfilling basic commodities, expansion of employment, and work opportunity, empowerment of domestic production, foreign exchange earnings, development of other economic sectors, as well as rural economic improvement. This is due to its characteristics that have comparative advantage in the form of the utilization of raw materials from domestic natural resources.

Agroindustry has an important role due to two reasons, namely: 1) agroindustry is capable to transform the comparative advantage into competitive superiority that eventually will strengthen the competitiveness of Indonesia's agribusiness products. If only depending on primary commodity, Indonesia will always be in the position of price taker in international market; 2) agroindustry is capable to create and keep the highest possible additional value as well as diversified products by accommodating consumers' preference both

domestically and internationally (Himpro Agri Unpad, 2014). Therefore, the development of agribusiness needs to be led to deepen agro industrial structure downstream to process agricultural products into processed products, such as intermediate product, semi-finished product, and final product.

Sustainable development of agro-industry needs to be supported by massive research and development activities so that the products are capable to compete and even dominate international market. Intensive research and development will produce the development of superior products, processes, and services with high efficiency. Substantive investment in research and development activities in this sector is also needed. Therefore, it is important to plan tax incentive policy to encourage the increase on the investment.

Income tax incentive is needed to stimulate investors to invest in research and development on agroindustry. Income tax incentive can be provided in the form of accelerated depreciation for factories and machines used. The effect of accelerated depreciation is the shift of depreciation expense in the initial years of investment so that the profit of the company will be low and as the consequence the tax due will be low as well. In several years ahead, when the business running smoothly and resulting in high profit, the tax due will be higher while the depreciation expense will be lower.

In addition, value added tax/VAT (PPN) incentive is also needed to be provided considering that processed agricultural product has been given VAT based on the regulation. Free-VAT facility is important to be provided for agro-industry products marketed domestically so that the price will be more competitive than the price for similar products imported from other countries. For international market, exported products have been free of VAT as it has also applied by other countries. Control over Indonesian domestic market is very important and strategic considering that nowadays Indonesian domestic market, with ever-increasing number of consumers, becomes the target of products from other countries.

2. Incentive in the form of super deduction, designed to support the role of UMKM in Information and Communication Technology (TIK) sectors

Micro, Small and Medium-scale Enterprise/MSME (UMKM) is the backbone of the society-based economy. It is proven that UMKM can survive to face global financial crisis occurring last 2007-2008. Even in the period of 2006-2010, the number of UMKM in Indonesia had grown continuously and reached 9.8% or 2.45% per year in average. Along with the growth of the number of the business units, the capitalization of UMKM also had a rapid growth into 23.85% in the same period. From that

number, UMKM gave contribution towards total export of non-oil for 17.03% per year in average. The portion is still low considering that UMKM controls more than 99% of total business units in Indonesia. It is expected that in the future the contribution of UMKM towards export will be increasing through the increase of capacity and competitiveness of products and services produced by UMKM sector (Sitepu, 2013a).

Information technology sector is one of competitive superiority of Indonesia. Based on the data of small micro industries in the period of 2010-2013 (BPS, 2014), industrial sectors are divided into 23 subsectors. The subsectors related to TIK sector are computer industry; optical and electronic goods; machinery industry and equipment that is not included to others subsector. From the data, it is known that micro industry in both subsectors have a tendency to decline in the matter of companies' number, output value, and additional value based on the market price. In other side, small industry showed an increase in those three indicators in the same period. It is an interesting fact to be observed. The data showing increase in small industry should be appreciated, since one of the factors encouraging the increase is micro industry turning into small industry. However, considering that most of business participants in TIK sectors are micro industry started from the creativity of an individual or a small group, the decline occurring in micro industry group needs to get serious attention. One of the possibilities is the decline of interest from participants in micro industry to enter an industry in TIK sector. The reasons for this vary; one of them is the non-supportive business climate. Like a baby learning to crawl or walk, the business participants in TIK sector recently starting their business need helps and supports. One of those helps and supports is tax incentives and fiscal support from the government.

To grow the business climate in UMKM sector, the government commit to provide institutional support as regulated in the Law No 20 Year 2008 regarding Micro, Small and Medium-scale Enterprise. One of the forms of the institutional support is to develop and improve incubator function. Incubator here means an institution providing services of the growth of new entrepreneurs and strengthening the access of resources for business progress for UMKM as the business partner. The incubators developed include technology, business and other incubators in accordance with the potential and resources of the local economy.

Based on the data from Creative Industries Society for Information and Communication Technology (MIKTI), in 2014, MIKTI cooperated with PT Telkom to construct 20 incubator centers in Jakarta, Bandung, Yogyakarta, and Denpasar (Kompas, 2014b). Incubator Centers will also be constructed in Palembang, Pekanbaru, Medan,

Balikpapan and Makassar. Digital Valley is one of the incubator centers running in Bandung and Yogyakarta. In incubator centers, beginners in digital creative field can realize their ideas through some technical aids. Up to this moment, local works are not capable yet in changing the consumers' attention from the imported digital-based products. Over 80% consumers still take an interest in imported products, particularly animation, online games, and business software.

The problem faced by business participants of TIK industry is weak capital and marketing. Supports for candidates of industry through incubator centers are still inadequate. Expansion on providing tax incentive and fiscal support is an effective instrument to handle such problem. The tax incentive provided can be in the form of super deduction for research and development expenses for micro and small enterprises, as applied by England. Providing the incentive will encourage the business participants in TIK sector to develop innovation considering the rapid change in this sector. Since the incentive in the form of super deduction is not applied yet in Indonesia, we need to establish a legal foundation for the implementation of the policy. The legal foundation is in the form of the Government Regulation and the Regulation of the Ministry of Finance as the conditions of the implementation of Law on Income Tax.

3. Incentive in the form of cash grant to encourage fundamental research and experimental development

Other than tax incentive, direct support or cash grant also need to be considered for the increase of the investment in research and development sector in Indonesia. The support in the form of cash grant has been applied through an institution under the Ministry of Finance, namely Indonesia Endowment Fund for Education (LPDP). This institution is Public Service Agency responsible in managing endowment fund from the allocation of educational fund.

One of LPDP's missions is to encourage applicable, strategic and/or innovative research and to create additional value through research funding. LPDP is responsible to participate in the development and implementation of researches in Indonesia. As a form of responsibility and participation, LPDP manages the fund of Indonesian Development Research. One of the forms of the funding for Indonesian Development Research is Fund of Innovative-Productive Research (RISPRO). Fund of RISPRO is divided into two categories based on the focus of research and development, namely Commercial Fund of RISPRO for food security, energy, and health; and Implementative Fund of RISPRO for eco-growth, governance, religion society, and culture.

The Requirements for Commercial Fund of RISPRO

Fund of RISPRO regarding commercialization of product/technology will be provided for researches that meet these requirements:

- a. The research should involve a partner so that the result can be directly applied/commercialized by the partner supported by a cooperation agreement;
- b. The partner is an industry whose major capital is owned by the Government/Local Government and/or company/Indonesian Citizen;
- c. The partner should have a commitment to contribute in the research in the form of cash or others that can be measured by money (in-kind);
- d. The contribution of the partner is in the form of cash at least 10% of the research funding proposed.
- e. The research should have business feasibility.

The requirements for Implementative Fund of RISPRO

Fund of RISPRO regarding the implementation of the policy model will be provided for researches that meet these requirements:

- a. Research in the first year can involve a partner (optional) and should involve a partner in the second year so that the result of the research can be implemented directly;
- b. The partner is a public sector institution (government and local government institution) or corporation capable to act as the regulator for the implementation of the research result or community group capable to act as the consumer of the research result;
- c. The research should have the feasibility of the implementation of the policy/model.

The Criteria of Fund of RISPRO

Fund of RISPRO is provided for researchers who meet these criteria:

1. The research is conducted by a group of researchers under research institution of the ministry/government and local government institution, private research institution, university, or other institutions competent to conduct research. Particularly for the group of researchers under research institution of ministerial/governmental institution should cooperate with university, local government, private research institution, or other institutions competent to conduct research;
2. The group of researchers should have integrity and commitment to finish the research in accordance with the result and time target signified on the integrity pact;
3. The group of researchers is led by a researcher with the minimal title of doctor or equally

qualified (in accordance with the standard of Indonesian National Qualification Framework (KKNI)) and has a track record of research in accordance with the sector proposed and showed in the biodata;

4. The group of researchers have research roadmap supporting the proposed sector;
5. The group of researchers is not currently undertaking further study and/or will take other academic activities that can interfere the research (Academic Recharging, Postdoc, etc.);
6. The group of researchers consists of at least 3 (three) people (including the leader), coming from the research institution of the ministry, research institution of the government and/or private institution, university, and partner, and/or other institutions competent to conduct the research;
7. The research proposed by the group of the researchers has been approved by the head of proposing institution and the head of partner institution proven by signatures in legalization sheet.

Based on the descriptions above, it can be concluded that the support in the form of research fund is provided for industrial research or applied research, that is, planned critical research or investigation intended to obtain knowledge and skill to develop new products or services or to improve the existing products, processes or services significantly (InnoviSCOP, 2014). Indeed, providing support towards applied research will result in reciprocity that can be directly perceived in the form of product that can be commercialized in a relatively short period of time of 2 years. However, applied research is a temporary and downstream process in the stream of research and development. Additional value produced is not actually great since it is only in the form of the improvement of the existing products, processes, or services.

In order to be able to produce a high-valued and original products, processes or services, a fundamental research is needed. Fundamental research is defined as experimental or theoretical work conducted especially to find out new knowledge on underlying basis of phenomena and facts that can be observed, without practical application or utilization (InnoviSCOP, 2014b). The product produced from fundamental research is generally cannot be commercialized, but can be a foundation for various further researches. A control over fundamental research will be a strong capital for advanced countries to be the leaders in innovation and technological sector, meanwhile other countries not having fundamental research will only be followers and imitators.

The next step of fundamental research is experimental development, or an activity to find out, combine, form, and use the knowledge in science, technology and business as well as other skills to

produce a plan or arrangement or design for new products, processes or services, either changed or improved. The activity involves other activities aiming to create conceptual definition, planning and documentation for new products, processes, or services, such as creating draft, plan and other documentations, as long as they are not intended for commercial use (InnoviSCOP, 2014c).

Based on the considerations above, providing fiscal support in the form of cash grant is better to be preferred for fundamental research and experimental development. It is required so that the parties involving in research and development activities are more encouraged to conduct fundamental research and experimental development rather than applied research. Indeed, the result of the research will not be perceived in a short term period, however, in a long term period, fundamental research and experimental development will produce products of innovation and technology that will put Indonesia as the leader in those sectors.

4. Incentives integrated with the concept of regional development.

Reflecting on the experience of India in the previous part, the determination of the focus on industrial development based on regions needs to be supported by the provision of tax incentives and fiscal support. Regions with superiority in certain sectors are developed into integrated industrial region. In Indonesia, the concept has been regulated in the form of Special Economic Zone (KEK). The development of KEK is intended to increase the investment through the preparation of the regions with geo-economics and geostrategic superiority. The regions are prepared to maximize industry, export, import, and other economic activities with high economic value. The concept carried on the development of KEK is a breakthrough of regional development for economic growth, such as industry, tourism, and trade in order to create jobs (Sitepu, 2013b).

KEK is a region with certain limits under the jurisdiction of the Unitary State of the Republic of Indonesia, defined to organize economic function and obtain certain facilities. The function of KEK is to conduct and develop business in trade, service, industry, energy and mining, transportation, maritime and fishery, postal and telecommunication, tourism and other sectors. Accordingly, KEK consists of one or several Zones, namely export processing, logistic, industry, technological development, tourism, and energy Zone; and the activities can be directed for export and domestic.

The criteria required so that a region can be appointed as KEK is it must be in accordance with Spatial Plan; it has no potential to disturb protected areas; it is supported by province/district/municipal government in the management of KEK; it is located in strategic position or has potential of superior

resources in marine and fishery, agriculture, mining, and tourism; it has clear borderlines, either natural or artificial borderlines.

Facilities provided for KEK are aimed to improve the competitiveness so that investors will take an interest to the region. The facilities are fiscal facilities such as taxation, customs, and excise, regional tax and levy, and non-fiscal facilities such as land, license, immigration, investment, and employment, as well as other facilities and conveniences that can be provided for the Zone in KEK, regulated by authoritative institution in accordance with the provisions of the legislation.

Other than KEK, other implemented policies of regional development are: (i) Bonded Zone; (ii) Industrial Zone; (iii) Integrated Economic Development Zone; and (iv) Free Trade Zone or FTZ Batam, Bintan, and Karimun (the Ministry of Finance, 2013). Broadly, each tax policy in that certain region provides special treatment relaxing the tax provisions in the form of giving tax allowance for income tax, exemption/suspension of import duty and exemption/free VAT intended to encourage regional economic growth. Excluding free trade zone and bonded zone, tax facilities have been not put to good use yet. It is due to several unavailable basic factors such as infrastructure and good connectivity with available growth centers. The government needs to consider applying tax incentives and fiscal support policy with particular design for integrated research and development activities with the concept of regional development.

5. Conclusions

Based on the aforementioned explanations, it can be concluded that the key to success for Indonesia to avoid middle-income trap is human resources and technology. To encourage innovation and technological advancement, the participation of various parties including the government and private parties is required. The government has a role not only in creating a supportive investment climate but also providing tax incentive and fiscal support capable to drive the activities of research and development.

The result of exploration towards the experiences of several countries used as references shows that countries with advanced research and development apply tax incentives and fiscal support policies that are both massive and having major impact. Several forms of incentive are operated in harmony with industrial development policy. Indonesia that is far behind other countries in science and technological sector needs to formulate aggressive tax incentive and fiscal support to win over the competition.

Several recommendations given are: (i) incentive is prioritized for agroindustry sector that is a comparative advantage of Indonesia; (ii) incentive in the form of super deduction is designed to support the role of UMKM in information and communication

technology (TIK) sector. (iii) incentive in the form of cash grant must support basic research; and (iv) incentive is integrated with the concept of regional development.

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