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The Economic Impact of Taiwan's Investment Tax Credits and its Direction of Adjustment

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Abstract

The Statute for Upgrading Industries (SUI) applies tax incentive, subsidies, and supporting measures to assist companies with industrial and technological activities, and the SUI is considered as one of Taiwan's key industrial technology policies. In the SUI, investment tax credits for R&D, personnel training, automation activities receive the highest share of tax credits, is the most important policy measure.

Under such circumstances, the purposes of this paper are twofold. First, this paper analyzes the inducement effects of the investment tax credit using the macroeconomic model to examine its economic benefit and cost. Secondly, this paper provides suggestions for the direction adjustment of the investment tax credit policy after exploring Taiwan's current fiscal condition, theoretical arguments as well as overall economic benefits.

1.Introduction

The Statute for Upgrading Industries (SUI), promulgated on January 1st 1991, acts as one of the Government's most important industrial technology policy implementations with its provisions of various tax incentives including accelerated depreciation (Article 5), investment tax credits for R&D, personnel training, automation and pollution control (Article 6), tax credits for investing in scanty areas (Article 7), investment tax credits for the newly emerging, important and strategic industry shareholders (Article 8), and five-year holiday or shareholder investment tax credits for the newly emerging, important and strategic industries (Article 9). The investment tax credits for R&D, personnel training, automation and pollution control in Article 6, the key policy implementation, account for approximately 1/3 of NT$100 billions (total tax revenue loss for the SUI) in average annually. The details of the enactment purposes, the applicable sectors and the scope of application, please refer to Table 1.

Since the tax credit implementations of the SUI shall conclude on December 31st 2009, it is important to discuss the pros and cons of their effects and the direction adjustments related to the SUI.

Under such circumstance, this paper aims to analyze the economic benefits and cost brought about by Article 6, the investment credits for R&D, personnel training, industrial automation and pollution control, as well as to discuss if these incentives should continue and to come up with policy suggestions.

There are five sections in this paper including the introduction and the second section explains the role the SUI plays in Taiwan's industrial technology policies and the importance of the investment tax credit in the SUI. Section three reviews existing literatures related to inducement effects and the economic benefits of the investment tax credit. The fourth section evaluates the overall economic benefits of this investment incentive using the macroeconomic model. Conclusion and policy recommendation are provided in the last section.

Table 1 The incentive schemes of the investment tax credit in the SUI

Enactment Purposes	1.Encourage investment in and upgrade of automation equipments 2.Encourage R&D, personnel training and pollution control activities that create positive external effects
Applicable Sectors	Companies incorporated under the Company Law
Application Scope	1.Procurement of equipment and technology 2.Expenditure of R&D and personnel training
Incentive Measures	Different tax credit rates depending on different expenditure: 1.Procurement of automation equipment and technology (1)Equipment: 7% (2)Technology: 5% 2.R&D and personnel training: 30%; the amount exceeding the average of the previous two years: 50%

Source: Collated by the author

2.The role of investment tax credits and the Statute for Upgrading Industries in Taiwan's industrial technology policy

Currently there is no central organization with overall responsibility for formulating and administering polices and activities in Taiwan. Indeed, various policies are formulated at different levels of government. There are certain division of labor in terms of technology and R&D work.

The basic research work is mainly carried out by Academia Sinica, the National Science Council (NSC) and various universities, whilst the task of applied research, technology development are the responsibility of Ministry of Economic Affairs (MOEA). MOEA provide funds for private firms or state-owned research institutions to carry out R&D work, and formulate tax incentives to encourage firms to invest in R&D work.

In general, governmental policies in support of innovation can be divided into three distinct categories:

1.policies aimed at encouraging the supply of R&D activities

2.policies aimed at increasing the demand for R&D activities

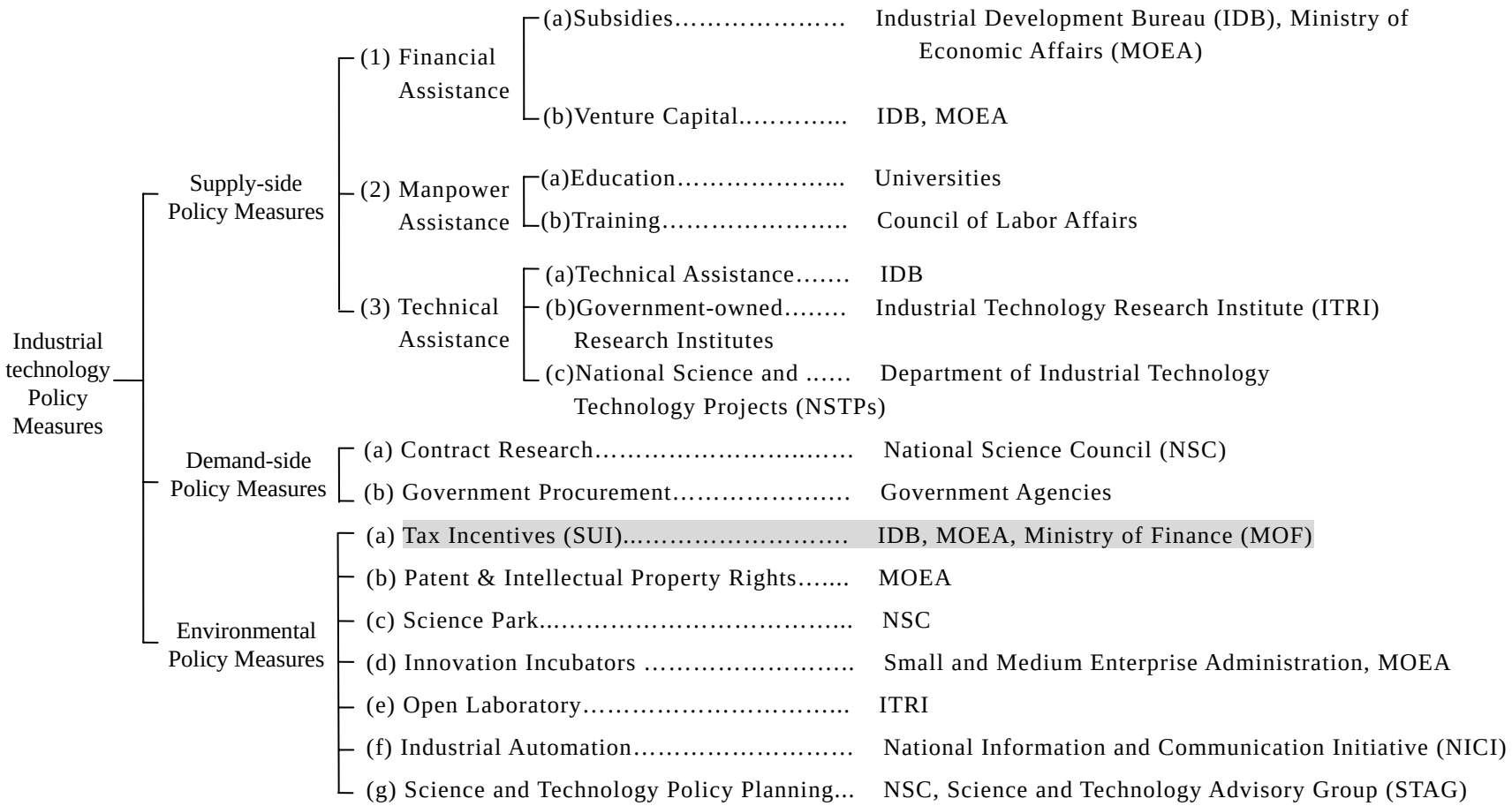
3.policies aimed at creating a favorable environment for society to engage in R&D activities

In Taiwan, the agencies that are responsible for these three types of activities are shown in Figure [1].

On the supply side, there is financial assistance, such as subsidies, loans and venture capital programs; manpower assistance programs, such as formal education programs and vocational training programs; technical assistance programs, such as technical assistance provided by the Industrial Development Bureau (IDB) or by government operated institutions, ITRI. on the demand side are contracted research and government procurement programs, under which the National Science Council or government agencies contract university professors or researchers from various research institutes to collect, analyze and even to make recommendations on various public policy issues. Through such projects, public policy makers are able to obtain up-to-date information on various public policy issues and, thus, are able to arrives at informed public policies.

To create a favorable environment for R&D activities, the government has developed various tax incentives (the SUI), patent and intellectual property rights, science based industrial parks, innovation incubators, open laboratory, and industrial automation programs. They are carried out by various government agencies.[1]

Of all these programs, the most important ones are the Statute for Upgrading Industries (SUI), ITRI and NSTPs which provides incentives for R&D activities and for the development of new technologies. These programs are crucial not only in terms of their contribution to the flourishing of R&D and innovation, but also in terms of their budget share.



note: Shadow area indicates the role of SUI in Taiwan's industrial technology policy.

Figure 1 Taiwan's innovation policy measures and their responsible agencies.

3. Literature Review

Realizing the importance of the SUI and the tax credit in Taiwan's industrial technology policies, we attempt to review related documents to understand the theories on which the tax credit incentive is based, as well as to compile previous literatures that evaluate economic benefits.

3.1 Theories

For a company, R&D investment is the key to industrial upgrading and transition as well as brings certain external benefits. That's why the Government uses tax credits to reduce the uncertainties and costs of R&D in hopes of encouraging companies to invest in R&D. From industry enhancement to national competitiveness promotion, there are theories to be based on.

As for automation, production automation can direct a country's industrial structure from being labor intensive towards being capital- and technology intensive. It is an important means to increase a country's competitive advantage. Production automation not only solves labor shortage, but also enlarges production scale and volume, which further increase production capacity and products' value-added. Companies are encouraged to adopt automation instead of the conventional labor-intensive production method so they can be less dependent on labor and less concerned about industrial hollowing-out.

On the other hand, companies are assisted with the enhancement of digital information efficiency. With the economy entering the digital era, a web-enabled enterprise can enhance efficiency within itself and of its upstream, midstream and downstream supply chains, which in turn create positive effects and externalities for the competitiveness of the overall industry. Therefore, it is necessary for a government to intervene and apply assistance in enterprise automation and digitization.

As for tax credits for pollution control, it can cause considerable external costs, tax credits can share the cost of investing in anti-pollution equipment, and facilitate their motivation for anti-pollution investment decision. So the ideas for the Government to provide tax credits to encourage investment in these areas are well founded.

3.2 Inducement Effect and Economic Benefit Evaluation

The methods to evaluate the tax credit results are based on previous literatures, in which the results are analyzed in the aspect of their inducement effects and economic

benefits. The inducement effect is also regarded as the marginal effect of the investment tax credit.

According to the literatures, the inducement effects of R&D tax credit have been around 16.6% (Lan, Wang, et el.); however, the effects of automation tax credit vary with the industry surveyed and were analyzed as 28% and 4.97~13.17% (Lan, Wang, et el. 1992; Wang and Tsai, 1994). The results of the OECD countries vary from 4~18% to as high as 100% (Hall and Van Reenen，2000). For the OECD countries, the results of the inducement effect are analyzed with R&D tax credits since most OECD countries do not provide tax credits for automation. (See Table 2)

Table 2　Inducement effect of R&D tax credit

Study	Expenditure elasticity of R&D tax credit	Time	Country
Australian Bureau of Industry Economics (1993)	-1.0	1984-94	Australia
McFetridge and Warda (1983)	-0.6	1962-82	Canada
Mansfield and Switzer (1985)	-0.04 to -0.18	1980-83	Canada
Bernstein (1986)	-0.13	1981-88	Canada
Bernstein (1998)	-0.14 (short-run) -0.3 (long-run)	1964-92	Canada
Mansfield (1986)	-0.35	1981-83	USA
Berger (1983)	-1.0 to -1.5	1981-88	USA
Bally and Lawrence (1987, 1992)	-0.75	1981-89	USA
Hally (1993)	-1.0 to -1.5	1981-91	USA
McCutchen (1993)	-0.28 to -1.0	1982-85	USA
Hines (1993)	-1.2 to -1.6	1984-89	USA
Nadiri and Mamuneas (1996)	-0.95 to -1.0	1956-88	USA
Bloom, Griffith and Van Reenen (1999)	-0.16 (short-run) -1.1 (long run)	1979-94	7 Industrialized countries

Source：Hall and Van Reenen（2000）。

The economic benefits are referred to as the effects on indexes like employment, GDP, tax revenue when companies are induced by tax credits to increase investment. The analyses of existing literatures are generally positive about the economic benefits of the investment tax credit.

Table 3 compiles the results of the R&D tax credit implementation of the SUI. Table 4 compiles the results of the automation investment tax credit implementation of the SUI. Table 5 compiles the results of the overall inducement effects and the macroeconomic benefits of Article 6 of the SUI, evaluated by Taiwan Research Institute (2003) using the macroeconomic model.

According to the literatures above, R&D and automation tax credits create positive inducement effects and economic benefits and contribute positively to companies' investment, return on investment and value-added. However, the literatures above focus mainly on the increase of benefits and investment and have yet considered possible costs, i.e. cost/benefit (net benefit) analysis. Moreover, the inducement effect results are based on the company survey samples, which may be biased because some companies have not applied for tax credits.

So this paper compares and analyzes both the international literatures and the surveys of the companies who have applied for tax credits. Moreover, we evaluate and compare the benefits and the cost of the tax credit using the macroeconomic model and then analyze the net benefits.

Table 3 Tax benefits for R&D investment in the "Statute for Upgrading Industries."

Item	Main Evaluation Conclusions	Evaluation Method (empirical Research)	Source
1. Incentive effect	The incentive effect of tax deductions is significant, with every NT$1 of deduction available for investment in R&D causing manufacturers to increase their spending on R&D by 16.6%.	The electronics components industry was sampled, with multi-variable analysis being conducted on the 124 manufacturers from which questionnaires ware returned.	Lan, Wang, Huang and Tsai (1992)
2. Economic benefits	The R&D benefits (development of new products and new technologies) resulting from tax deductions on investment in R&D had a significant, positive impact on economic benefits (return on investment and added value).	135 manufacturers in various industries were sampled (including 110 which had applied for tax deductions and 25 which had not); Lisrel model analysis was employed.	Wang, et al. (1994)
3. Contribution to the economy and industrial upgrading as a whole	1. As far as real GDP is concerned, in 1993 and 1994 the effect of investment in R&D was around 1.10% and 1.08% respectively. That is to say, for every NT$1 invested in R&D, real GDP was increased by around NT$1.14 and NT$1.08 respectively. 2. In 1994, the contribution made by tax deduction incentives for investment in R&D under the Statute for Upgrading Industries to the increase in average labor output in manufacturing industry came to NT$25,800 (0.42%). The contribution made to export value in technology-intensive industries was NT$2.574 billion (0.26%). These figures confirm that tax deductions for investment do indeed make a contribution to industrial upgrading.	1. Overall model evaluation. 2. Overall model evaluation in combination with a questionnaire survey evaluation of incentive results.	Sun, et al. (1997)

Source: Collated by the authors.

Table 4 Benefits of tax credit for investment in automation provided by the "Statute for Upgrading Industries."

Item	Main Evaluation Conclusions	Evaluation Method (empirical Research)	Source
1. Incentive effect	1. For every additional NT$1 spent by manufacturers on automation for production facilities, approximately NT$0.28 derives from tax deduction incentives.	1. 124 questionnaires returned from manufacturers in the electronics components industry.	Lan, Wang, Huang and Tsai (1992)
	2. The impact of the tax incentives on manufacturers' investment in automation of production facilities is around 4.97%-13.17%.	2. Analysis of questionnaire surveys in the electronics components, basic chemical materials, textiles and iron and steel industries.	Wang and Tsai (1995)
2. Economic benefits	Increase in production performance (including increased output, reduced fail rate, increased product stability etc.) resulting from automation, averaged 10%-20%.	As above.	Wang and Tsai (1995)
3. Contribution to the economy as a whole and to industrial upgrading	1. In 1992, economic benefits from investment in automation of production were: GDP increased by approx. 0.86%; capital formation by 1.09%; exports by 0.04%. Unemployment rate decreased by approx. 0.06%; ave. rate of wage increases reduced by 0.44%. 2. If total value of automated production equipment in manufacturing industry is taken to be around NT$281,793,000,000, then every NT$1 invested in automation of production facilities produces an increase of approximately NT$0.13 in GDP, and an increase of approximately NT$0.05 in manufacturing industry added value.	Overall model evaluation.	Wang and Tsai (1995)

Source: Collated by the authors.

Table 5 Compilation on the overall implementation results of the investment tax credit of Article 6 of the Statute for Upgrading Industries

Conclusion / Evaluation Items	Main Evaluation Conclusions	Source
1.Inducement Effects	1. Based on the Statute for Upgrading Industries amended on December 31st 1999, the investment incentive is evaluated using the macroeconomic model and analyzed for its quantitative benefits: in 2002 the induced R&D production value is quantified as NT$4.1 billions; from 1993 to 2002 the inducement effects are quantified as NT$39.2 billions.	Taiwan Research Institute (2003)
2.Contribution to macroeconomics and industrial upgrading	1. The Statute's contribution to GDP inducement is 0.52%, evaluated by using the macroeconomic model. 2. Based on the Statute for Upgrading Industries amended on December 31st 1999, the investment incentive is evaluated using the macroeconomic model and analyzed for its quantitative benefits: in 2002 the induced GDP production value is quantified as NT$48.4 billions; from 1993 to 2002 the inducement effects are quantified as NT$428.1 billions.	Taiwan Research Institute (2003)

Source: Taiwan Research Institute (2003)

4. Evaluation Direction and Results

4.1 Inducement Effects

The inducement effects are evaluated based on the surveys completed by companies who have applied for the tax credits based on Article 6 of the SUI. A cluster stratified random sampling was conducted and 299 out of 1,000 samples were returned; the return rate was around 30%. Among the companies that returned the samples, 241 of them (around 80%) had applied for and been granted tax credits.

The survey shows a big discrepancy among companies on the inducement effects of the automation investment tax credit. The companies who believe to be unaffected take up the largest portion, around 26.7%. Next, there are 17.2%, 10.4% and 9.5% of the companies who believe to be affected by 10~20%, 40~50% and 0~10%. If it is further analyzed with the weighted average method, the average inducement effect is 29.2%.

The results for the inducement effects of the R&D and the personnel training tax credit are 37.9% and 34.2% respectively.

The survey results shown above are higher than the past (16.6%) but they are acceptable if compared with the results in the international practice (see Table 2).

4.2 The evaluation of economic benefits

This paper will use Keynes' macro econometric model to evaluate the economic benefits of the policies. The model framework consists of three parts: commodity market, labor market and monetary market. Proper variables and parameters are set according to various tax credit measures. The model structure and the effect flow path are shown in Fig. 2.

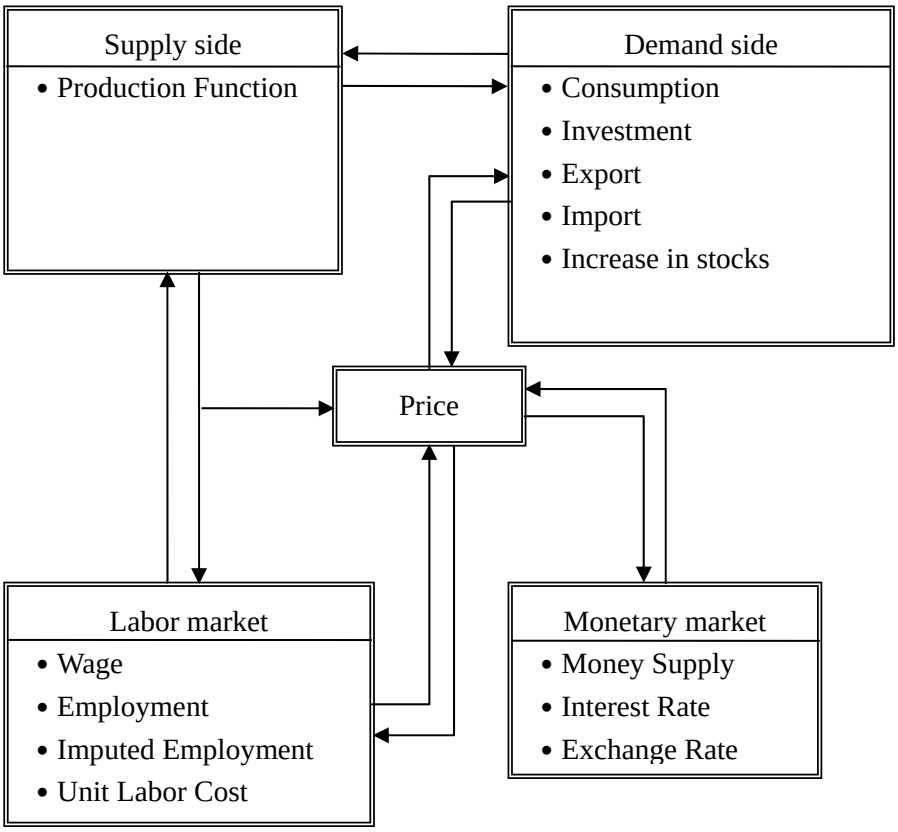


Fig. 2 The Framework of Macro econometric Model

4.2.1 The policy

To encourage companies to invest in R&D, personnel training, automation and hi-tech industries, the Government has enacted tax credit measures in 6 areas, which are illustrated in Article 6, 7, 8 and 9 of the SUI:

1. R&D (Article 6)

2. Automation (Article 6)

3. Personnel training and pollution control (Article 6)

4. Investment in scanty areas (Article 7)

5. Shareholder tax credit (Article 8)

6. Five year tax holiday (Article 9)

Five of the six items above are related to industrial technology except the item "investment in scanty areas," which is related to balanced development of different regions. However, this paper only focuses on R&D and automation, whose tax credits are applied for and issued the most. The former refers to the development of new technologies within the company, and the latter refers to the procurement of developed technologies. Both promote investment in and competitiveness of industrial technology so they are this paper's main evaluation subjects on the effects of the policies.

4.2.2 The scenario

As an incentive measure to encourage investment, the investment tax credit measure has direct effects of tax revenues foregone and increased policy induced investment. Increased investment from companies can promote production and sales volume, which can further economic growth and allow the Government to increase tax revenue by levying business tax. This is an inducement effect that increases tax revenue and makes up for the loss from the tax credit. But it is required to be evaluated by the model to see if the net tax revenue effects increase or decrease. The evaluation is done with two scenarios: scenario 1 analyzes the benefits of R&D tax credit; scenario 2 analyzes the benefits of automation tax credit.

- **Scenario 1 (R&D Tax Credit)**

According to the evaluation of the benefits of the R&D incentive measure done by Wang & Tsai (2003), for the public companies of the manufacturing industry in Taiwan, the output elasticity of the R&D expenditure is 0.2, while the private companies of the same industry have generally less R&D expenditure and results than the public companies. Therefore, the output elasticity of the expenditure in R&D for the overall manufacturing industry is less than 0.2. If it is assumed to be 0.1, the increase of 100% of the R&D expenditure will increase the output of the manufacturing industry by 10%, an effect equal to the increase of Total Factor Productivity (or technological progress) by 10%. The R&D expenditure of Taiwan's manufacturing industry in 2004 is NT$156 billions, i.e. the R&D expenditure of NT$15.6 billions can bring 1% of the technological progress for the manufacturing industry. The R&D expenditure of NT$156 billions include self-initiated investment and induced investment by the incentive measure, estimated to be around NT$52 billions, which can bring 3.3% of the technological progress for the manufacturing industry.

- **Scenario 2 (Automation Tax Credit)**

For the evaluation of the benefits of the automation equipment investment incentive measure: investment in automation equipment contributes to increased production of the company in terms of enhanced production technology and increased capital stock of production equipment increasing production volume. That means with investment of NT$10 billions in the procurement of automation equipment, NT$10 billions worth of the capital stock is increased immediately. Meanwhile, with the output of NT$3 billions R&D effects, around 0.2% technological progress is achieved. The induced investment from the automation incentive measure is estimated to be NT$38.9 billions in 2004, which can bring 0.8% technological progress for the manufacturing industry.

4.2.3 The result

Based on the above scenarios, the economic benefits of the industrial technology related tax credit policies are evaluated using the macroeconomic model and the results are shown in Table 6.

In scenario 1, where the policy induced R&D investment is NT$52 billions: if the investment credit rate is 20%, the tax revenue is reduced NT$10.4 billions but the technological progress for the manufacturing industry is increased by 3.3%, which then increases NT$185.1 billions of the national GDP with NT$163.3 billions from the manufacturing industry. The employment population will see 47,942 more people, among which 45,364 are employed by the manufacturing industry. As a result, the tax revenue will increase NT$22.8 billions, i.e. the net increase of the tax revenue will be NT$12.4 billions. It is evident that this policy brings positive benefits for both Taiwan's economy and the Government's tax revenue.

In scenario 2, where the policy induced automation investment is NT$38.9 billions: if the investment credit rate is 20%, the tax revenue is reduced NT$7.8 billions but both NT$38.9 billions investment and 0.8% the technological progress are increased for the manufacturing industry, thus increases NT$107.9 billions of the national GDP with NT$950 billions from the manufacturing industry. The employment population will see 28,003 more people, among which 26,491 are employed by the manufacturing industry. As a result, the tax revenue will increase NT$13.3 billions, i.e. the net increase of the tax revenue will be NT$5.5 billions. It is again evident that this policy brings positive benefits for both Taiwan's economy and the government's tax revenue.

Table 6 The policy effect

Units: NT$ million(s) : % : people

Item		Scenario 1	Scenario 2
GDP	Total	185,126	107,918
	Agriculture, Forestry, Fishing & Animal Husbandry	0	0
	Manufacturing	163,344	95,026
	Construction & Building	67	39
	Wholesaling & Retailing	5,728	3,343
	Hotels & Restaurants	3,047	1,778
	Transportation, Storage & Communication	1,047	636
	Finance & Insurance	3,385	2,054
	Real Estate, Rental & Leasing	3,237	1,964
	Professional, Scientific and Technical Services	697	407
	Educational Services	0	0
	Medical, Healthcare & Social Welfare Services	381	222
	Cultural, Sport & Leisure Services	341	199
	Other Services	3,850	2,249
	Producers of Government Services	0	0
	Other Producers	0	0
Employ-ment	Total	47,942	28,003
	Agriculture, Forestry, Fishing & Animal Husbandry	0	0
	Mining & Quarrying	7	4
	Manufacturing	45,364	26,491
	Electricity Gas & Water	14	8

Item		Scenario 1	Scenario 2
	Construction & Building	11	6
	Wholesaling & Retailing	1,079	630
	Hotels & Restaurants	574	335
	Transportation, Storage & Communication	56	34
	Finance & Insurance	90	55
	Real Estate, Rental & Leasing	86	52
	Professional, Scientific and Technical Services	162	95
	Educational Services	0	0
	Medical, Healthcare & Social Welfare Services	89	52
	Cultural, Sport & Leisure Services	79	46
	Other Services	332	194
Increased Tax Revenue	Total (1)	22,846	13,312
	Earned Income Tax	5,286	3,079
	Indirect Business Tax	12,056	7,028
	Direct Business Tax	5,504	3,206
Induced Investment		51,990	38,887
Tax Revenue Loss (2)		10,398	7,777
Investment Credit Rate (%)		20	20
Net Tax Income (+) or Loss (-)(3)=(1)-(2)		12,448	5,535

Source: Estimation by this research

5.Conclusion & Policy Suggestions

The Statute for Upgrading Industries (SUI) is one of the most important industrial technology policies to assist private sectors by the Government, and its conservation or abolishment will direct the future development of industrial technology. The analyses and examples in this paper have shown positive inducement effects, economic benefits and net benefits from the R&D and automation tax credits provided by the SUI. The results of the investment credit policy made by the Government have been confirmed positive.

But in the recent years, Taiwan has seen serious fiscal difficulties (the government debts have reached NT$4 trillions) and the pressure of tax shortage has made the SUI and its tax credit policy targets of criticism. It seems that this tax incentive scheme has been regarded as the main factor that has put the nation's finance out of balance. Its future adjustment is inevitable. The automation tax credit policy is especially in need for change due to its minimal external benefits, benefiting almost exclusively the company who is credited.

Moreover, on the pollution control, the environmental protection policy around the world has changed in the recent years from direct regulations to gradually introducing economic instruments and market mechanisms. The purpose is to internalize the external costs that are created during the production and consumption stages to actualize the user-pays principles.

So this paper has come up with the following suggestions for the direction of amendment to the SUI:

1. **Reduce the fiscal burden by providing diversified incentive instruments along with the tax credit:** The tax incentive instrument is under a lot of restrictions when the government faces fiscal deficit. In the future, when setting policies related to industrial transition and national competitiveness, especially the tax incentive instrument, the Government shall pay more attention to the direction of relaxing regulations, lifting controls, and providing budgeted subsidies or other incentive instruments to assist businesses. Other various incentive instruments already included in the SUI, such as technical and R&D assistance, grants, low-interest loan, will all help relieve the financial burden of the Government.

2. **Reduce the tax credit rates for automation and pollution control, and maintain the tax credit rates for R&D and personnel training, which provide more external benefits:** Generally, R&D and personnel training provide more external benefits and shall encourage more investment with lower cost by tax credits, so the private sectors in the country can invest more in R&D and personnel training which will help promote the hi-tech industry

and enable technology in traditional industries. On the other hand, automation provides less externalities and its incentive is more exclusive to the company. Pollution control provides more external costs but the world trend stresses both subsidies and penalties in dealing with the issue. Therefore, both automation and pollution control shall see gradual decrease in their tax credits.

3. **Include the expenditure of marketing research in the scope of the tax credit application:** Taiwan's economic system has been mainly providing OEM services and has not done enough consumer and market research in branding development, so should marketing research expenditure included in the tax credit applications, companies can be encouraged to invest in the development of international brands. The companies can be encouraged to move from providing OEM services to developing branding sales.

Notes

1. Among Taiwan's industrial technology policy measures, state-owned research institutions (such as ITRI), Science Park, the Statute for Upgrading Industries (SUI) innovation incubator and open laboratory are considered effective and successful (Lee and Wang, 2003). The arguments of Lee and Wang (2003) are as follows. First, ITRI play an intermediate role between government and private sector. With government financial support, ITRI develops advanced technology and transfers them to private sector; which make up the insufficient amount of R&D investment from SMEs. Second, Science Park creates industrial cluster effect, which can help firms to enjoy external economies benefit. Third, based on functional activities (R&D, personnel training) tax incentives; SUI has been successfully encouraging firms to involve in more R&D and personnel training investments. Fourth, innovation incubators and open laboratory help start ups and SMEs respectively to engage in more R&D investments by sharing their cost and risk.

   As for the implications for other countries, neutral and market principle abidance policy measures are supported by theoretical arguments. In practice, this proposition also stands. In Taiwan's experience, Science Park, open laboratory and innovation incubators are considered as infrastructural provision measures, which create positive impacts for industry without distorting market mechanism. SUI provides incentive for activities with externality, and their economic benefit has been confirmed in this paper. In addition, ITRI fills in the gap of SMEs' lacking R&D expenditure, which is also considered as a market friendly measure.

   In my opinion, the above policy measures are neutral and respecting market mechanism, and they can be applied to other countries to a larger extent.

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