

DESIGNING R&D INCENTIVES IN HONG KONG

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The Hong Kong government has recently enacted legislation granting tax benefits for R&D expenses to boost investment in R&D in Hong Kong. This Article analyzes what would be the optimal design of R&D incentives in Hong Kong, and concludes that the new tax benefits for R&D are unlikely to increase R&D investment in Hong Kong in the most cost-effective manner. The Hong Kong government should consider replacing these tax benefits with other, more effective R&D subsidies.

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INTRODUCTION

Hong Kong's high-tech sector has been lagging behind other countries and major cities in the region, such as Singapore and Shenzhen.¹ Unlike many countries that provide R&D tax benefits, Hong Kong did not provide such incentives until recently. Are R&D tax benefits the panacea that will boost the development of Hong Kong's high-tech sector? This is the view of the Hong Kong government that recently enacted legislation granting a super deduction for R&D expenses.² Providing tax benefits is supported by a few commentators³ and organizations.⁴

Contrary to this view, this Article contends that these R&D tax benefits are unlikely to increase R&D investment in Hong Kong in the most cost-effective manner. Instead of providing tax benefits that are described as a "budget Trojan horse" by some tax policy scholars,⁵ the Hong Kong government should consider replacing the tax benefits with other, more effective R&D subsidies.

In general, designing optimal R&D subsidies (including tax benefits for R&D) requires two stages:⁶ In the first stage, the characteristics of the optimal R&D subsidy should be determined, irrespective of whether the subsidy is granted through the tax system, given as a cash subsidy, or provided through other

¹ See Klaus Schwab, *The Global Competitiveness Report 2016-2017*, WORLD ECON. F., at 16, 27 (stating that Hong Kong remains "far behind the world's innovation powerhouses" and that "[t]he challenge for Hong Kong is to evolve from one of the world's foremost financial hubs to become an innovative powerhouse: with the exception of the market size pillar (33rd), innovation remains the weakest aspect (27th) of Hong Kong's performance and the business community consistently cites the capacity to innovate as their biggest concern;" and that Singapore is ranked 9th in the world and 2nd in Asia, after Japan in the innovation pillar in this report); *Shenzhen Is A Hothouse of Innovation: Copycats are Out, Innovators are In*, THE ECONOMIST (Apr. 8, 2017).

² Inland Revenue (Amendment) (No. 7) Ordinance 2018. The term "super deduction" (which is referred to as "enhanced deduction" in this legislation) means that a deduction greater than 100% (for example, 200% or 300%) of the expense is granted for a certain qualifying expense.

³ Jingyi Wang, *Hong Kong Losing Out in Powering Innovation: The Necessity of Introducing New Research and Development Tax Incentives in Hong Kong*, 47 HONG KONG L. J. 143 (2017).

⁴ Hong Kong Institute of Certified Public Accountants, *Tax Policy and Budget Proposals 2016-17* (2016) and *Tax Policy and Budget Proposals 2017-18* (2017).

⁵ Stephen E. Shay, J. Clifton Fleming & Robert J. Peroni, *R&D Tax Incentives: Growth Panacea or Budget Trojan Horse?*, 69 TAX L. REV. 419 (2016).

⁶ Noam Noked, *Integrated Tax Policy Approach to Designing Research & Development Tax Benefits*, 34 VA. TAX REV. 109, 143 (2014).

mechanisms.⁷ In the second stage, institutional design considerations should be evaluated to determine whether the subsidy should be provided through the tax system.⁸ A tax subsidy is, in substance, a *spending program* administered through the tax system.⁹ It is generally possible to structure a spending program (for example, a grant program) that would be economically equivalent to a tax benefits program and vice versa.¹⁰ Thus, the decision whether benefits should be granted as tax benefits or as cash subsidies largely depends on institutional design considerations: which government agency would be the best choice for administering the program?¹¹

The evaluation and design of tax benefits for R&D should be done as part of a broader evaluation of possible government policies to support the development of the high-tech sector in Hong Kong. This evaluation should include cost-benefit and cost-effectiveness analyses for each of the subsidies to ensure that the alternative policies are assessed under the same methodology, and that the best policies are adopted. This process should also ensure that the policies are coordinated so that there is no unintended “double dipping” or other inefficiencies as a result of uncoordinated policies designed and administered by separate governmental bodies. This Article recommends that the evaluation and design of all R&D-related policies, including R&D tax benefits, should be integrated under one governmental office, and not divided between separate parts of the government based on the type of the instrument.

⁷ *Id.*

⁸ David A. Weisbach & Jacob Nussim, *The Integration of Tax and Spending Programs*, 113 YALE L.J. 955 (2004).

⁹ This is the main conclusion of the extensive literature on tax expenditures. *See infra* note 39.

¹⁰ Jacob Nussim & Anat Sorek, *Theorizing Tax Incentives for Innovation*, 36, VA. TAX REV. 25 (2017). For example, it is possible to design as economically equivalent a cash subsidy with a matching requirement and a refundable tax credit. It is possible to create a subsidy economically equivalent to a non-refundable tax credit or a super deduction by limiting the maximum annual subsidy to the annual tax liability of the relevant recipient. However, there may be differences between certain commonly used subsidies and tax benefits, so the effect of those instruments might not be identical. This is further discussed in section C below.

¹¹ Weisbach & Nussim, *supra* note 8. Both subsidies and economically-equivalent R&D tax benefits must be compliant with the rules of the World Trade Organization (WTO). Therefore, the choice of instrument should not make a difference when assessed by the WTO.

There are serious doubts about whether a super deduction would be the most cost-effective measure for increasing R&D investment in Hong Kong. A super deduction favors companies with taxable income in Hong Kong, and disfavors foreign companies that do not have a substantial taxable income in Hong Kong that could be offset by the deduction, as well as start-up companies that typically generate losses in their early stages. Thus, the new super deduction is unlikely either to attract substantial foreign investment in domestic R&D or to boost the growth of start-ups in Hong Kong. In addition, the empirical evidence in the economic literature on the impact of the super deductions and tax credits for R&D expenses raises doubts as to whether these subsidies are cost-effective.¹² It is questionable whether one dollar of foregone tax revenue on R&D super deduction and tax credit will raise expenditure on R&D by more than one dollar.¹³

Providing an economically-equivalent cash subsidy through a specialized agency would likely be more efficient than providing a tax subsidy—such as a super deduction—through the tax system.¹⁴ In recent publications, tax policy scholars have argued that the tax authority is largely not suited to designing and implementing R&D-inducing mechanisms, and that R&D-inducing tax incentives should be generally repealed and replaced by cash transfer programs.¹⁵ These cash subsidies are typically managed by specialized government agencies. A specialized agency such as Hong Kong's Innovation and Technology Fund (ITF) has more relevant expertise than Hong Kong's tax authority, the Inland Revenue Department (IRD). For example, the ITF can better assess which expenses qualify as R&D expenses. As the ITF already administers several

¹² See text accompanying *infra* note 72.

¹³ See, e.g., CPB Netherlands Bureau for Economic Policy Analysis, *A Study on R&D Tax Incentives* 5 (The European Comm'n, Working Paper No. 52) (stating that “Studies that are more rigorous find that one euro of foregone tax revenue on R&D tax credits raises expenditure on R&D by less than one euro.”).

¹⁴ Nussim & Sorek, *supra* note 10.

¹⁵ See Shay et al., *supra* note 5, at 455 (proposing repealing R&D tax incentives and shifting “revenue savings to direct expenditures for peer-reviewed R&D proposals oriented toward basic R&D and risky development R&D”); Nussim & Sorek, *supra* note 10, at 30 (stating that “[t]he general conclusion is that public tasks of fostering innovation should not be allocated to the tax agency. The tax authority is largely not suited for designing and implementing innovation-inducing mechanisms. Innovation-inducing tax incentives should be generally repealed and replaced by cash transfer programs, managed by government agencies that specialize by subject-matter.”)

subsidy schemes, administering an additional R&D subsidy program by the IRD would likely result in larger coordination costs. Even if a tax subsidy is too expensive or ineffective, it would be difficult to amend or repeal it because it is provided through legislation, whereas there may be more flexibility built into a subsidy designed and administered by a specialized agency. There is typically a greater ability to manage a cash subsidy within a budget, whereas a tax benefit is an open-ended benefit that is typically not subject to a budget constraint.

In addition, multinational enterprises (MNEs) have reasons to prefer non-tax subsidies over tax benefits because of the international tax reforms under the OECD's project on base erosion and profit shifting (BEPS).¹⁶ These international tax reforms increase the risk that other countries will tax the income of MNEs if such income is exempted from tax in Hong Kong.¹⁷ Therefore, Hong Kong is likely to attract more MNE investment in R&D if it replaces its tax subsidy (the new super deduction) with an economically-equivalent cash subsidy.

This Article proposes that instead of foregoing tax revenues to fund a super deduction, the government should use these resources to fund other, more cost-effective subsidies.¹⁸ While structuring a cash subsidy economically equivalent to a super deduction or tax credit would likely be superior to providing these benefits through the tax system, other subsidies might be more successful in boosting the development of Hong Kong's high-tech sector. Subsidies that target investment in human capital, especially that of inexperienced employees, are likely to generate positive spillovers by improving the local talent pool.¹⁹ Providing benefit packages to selected MNEs in exchange for their commitment to employing a certain number of local R&D workers can have a substantial impact on the domestic high-tech sector because these MNEs can train a high number of local employees and contribute to the development of a specialized hub. In addition, the Hong Kong

¹⁶ Noam Noked, *From Tax Competition to Subsidy Competition* (working paper, 2018).

¹⁷ *Id.*

¹⁸ See Shay et al., *supra* note 5, at 455, for a similar proposal regarding R&D tax credits in the United States.

¹⁹ Noked, *supra* note 6, at 145.

government should consider improving and possibly expanding the existing cash subsidy schemes.

This Article is organized as follows: Part I reviews the subsidy schemes tax benefits for R&D in Hong Kong, part II evaluates these policies, and part III concludes.

I. BACKGROUND, SUBSIDIES AND TAX BENEFITS

Why should the Hong Kong government, or any other government, provide any economic benefit for R&D? In general, countries compete to attract R&D activities because of the domestic spillovers that they generate.²⁰ The economic literature shows that R&D activities have a significant influence on employment, human capital, productivity, and economic growth.²¹ Investment in R&D can generate significant positive spillovers from developing a pool of experienced tech professionals in Hong Kong, who contribute to the economy by holding high-paying jobs, launching start-ups, and by attracting MNEs to invest in high-tech companies and R&D centers in Hong Kong. These effects could increase Hong Kong's GDP, similar to other countries with a thriving high-tech sector such as Ireland and Israel. Over time, if efforts to boost investment in the high-tech sector are successful, it is expected that the private sector investment in R&D will increase and the need for government support will decrease.

The Hong Kong government has been providing support for R&D through non-tax measures by investing in infrastructure, universities, and funding programs for R&D.²² Hong Kong has expanded its spending on R&D in recent years.²³ The ITF, a Hong

²⁰ Shay et al., *supra* note 5, at 440-41.

²¹ Noked, *supra* note 6, at 115.

²² Wang, *supra* note 3, at 148-50.

²³ Gregory So, *LCQ9: Competitiveness of Hong Kong* (Nov. 9, 2016), http://www.cedb.gov.hk/citb/en/Legco_Business/Replies_to_Legco_Questions/2016/P2016110900296.html [<https://perma.cc/RN98-SDHU>] (last visited Nov. 16, 2018) ("Following the establishment of the Innovation and Technology Bureau in November last year, the government has invested over \$18 billion to formulate a series of initiatives with a view to fostering I&T development in Hong Kong in multiple aspects, including increasing basic infrastructure for research and development (R&D); funding universities in conducting midstream research and commercialising R&D results; promoting 're-industrialisation'; subsidising the industry's adoption of technology to upgrade and transform; supporting start-up developments; nurturing R&D talents; and funding projects that make use of I&T in improving the people's daily living.").

Kong government fund, administers eight separate subsidy programs, some of which are for private companies, some for universities, and one is for collaborations between universities and private companies.²⁴

The largest R&D cash subsidy program for private companies' R&D expenses is the Enterprise Support Scheme (ESS), which provides up to HK\$10 million (approximately US\$1.28 million) to approved projects on a dollar-for-dollar matching basis.²⁵ A company that receives this subsidy can also apply for the Research and Development Cash Rebate Scheme to receive a cash rebate of up to 40% of certain expenses.²⁶ Under the requirements of the ESS, the applicant needs to be a Hong Kong incorporated company, the project period should not be longer than two years, and the company should own all IP rights arising from the project.²⁷ The government's contribution is not recouped, and benefit sharing of commercialized R&D results is non-mandatory, although the ITF may favor proposals that include benefit sharing with the government.²⁸ It is unclear how accessible the ESS is for start-ups and small companies with limited resources.²⁹ Cyberport, an incubator that is wholly owned by the Hong Kong government, also provides financial support to high-tech companies. It offers various

²⁴ For information about these programs, see ITF, <http://www.itf.gov.hk/l-eng/about.asp> [<https://perma.cc/6QTD-JWFZ>] (last visited Nov. 16, 2018) (listing the ITF subsidy programs, among which Enterprise Support Scheme, Research and Development Cash Rebate Scheme, and Technology Voucher Programme are for private companies; Technology Start-up Support Scheme for Universities, Midstream Research Programme for Universities, Innovation and Technology Support Programme, and Guangdong-Hong Kong Technology Cooperation Funding Scheme are for universities. The University-Industry Collaboration Programme is for collaborations between universities and private companies).

²⁵ ITF, <http://www.itf.gov.hk/l-eng/ESS.asp> [<https://perma.cc/HA26-TQLE>] (last visited Nov. 16, 2018) (providing more information about Enterprise Support Scheme).

²⁶ *Id.* This means that the effective matching ratio is more generous than 1:1.

²⁷ *Id.*

²⁸ ITF, https://www.itf.gov.hk/l-eng/ESS_FAQ.asp#7 [<https://perma.cc/EDV9-TW6X>] (last visited Nov. 16, 2018) (“Benefit-sharing will be considered together with other components under Relevance with Government Policies or in Overall Interest of the Community, the total weighting of which is 10%.”).

²⁹ Another program administered by the ITF, the Technology Voucher Program, offers small to medium private companies up to HKD 200,000 for projects that aim to improve productivity through technological solutions. In the light of the low amount offered and the onerous application process, it is unclear how accessible and effective this subsidy is, and whether the companies that have the resources to apply for this subsidy really need government support.

subsidies and financial support to selected companies.³⁰ It also provides co-working space for local start-ups and foreign companies.³¹

Until recently, Hong Kong did not provide any tax benefits for R&D activities. Proposals to adopt a super deduction or a tax credit for R&D in Hong Kong have been floated for the last few years. For example, the Hong Kong Institute of Certified Public Accountants expressed its support for super deductions of 150% in its comments on the 2016-17 budget and the 2017-18 budget.³² Similarly, Wang argued that it is necessary for Hong Kong to adopt R&D tax benefits.³³

Mrs. Carrie Lam, Hong Kong's Chief Executive, proposed a super tax deduction for R&D activities as a way to boost R&D activities in Hong Kong.³⁴ Following the Chief Executive's proposal, the Hong Kong government has recently enacted legislation granting a super deduction of 300% for the first HK\$2 million and 200% for the remainder of the amount of R&D expenditures that meet certain conditions.³⁵ This new tax benefit

³⁰ Cyberport, <http://www.cyberport.hk/en> [<https://perma.cc/WJ2M-3AA7>] (last visited Nov. 16, 2018).

³¹ *Id.*

³² Hong Kong Institute of Certified Public Accountants, *supra* note 4.

³³ Wang, *supra* note 3 at 166-167. Wang recommended considering a super deduction of 150-200% for qualifying R&D expenditure, and possibly an additional volume-based tax credit that may be refundable.

³⁴ Joyce Ng, *New City Leader Carrie Lam Puts Tax Reform at the Top of Her Agenda*, SOUTH CHINA MORNING POST (Mar. 28, 2017, 11:52 PM), <https://www.scmp.com/news/hong-kong/economy/article/2082903/new-hong-kong-leader-carrie-lam-puts-tax-reform-top-her> [<https://perma.cc/MR5X-QMYQ>]. Mrs. Lam's election manifesto stated the following: "At present, the research and development (R&D) expenditure in Hong Kong only accounts for 0.74% of our GDP, which is far lower than our neighbouring countries and places such as Singapore (2%), Taiwan (3%), Shenzhen (4%) and South Korea (4%). In fact, 56% of our R&D spending comes from the public purse. Hong Kong needs to propel its economy with innovation. For that we have to introduce additional tax deductions to encourage R&D. The spending of enterprises on R&D will enjoy tax deductions that are higher than the relevant amounts actually spent, such as 200%. Additional tax deductions may also apply to spending on environmental protection initiatives, culture, arts and design so as to promote the development of these industries." See Carrie Lam, *Connecting for Consensus and A Better Future, Manifesto of Carrie Lam, Chief Executive Election 2017* (Feb. 27, 2017), §§ 3.50 & 3.51, https://www.ceo.gov.hk/eng/pdf/Manifesto_words_E_revised.pdf [<https://perma.cc/B5AS-PWMV>].

³⁵ The Inland Revenue (Amendment) (No. 7) Amendment 2018, *supra* note 2. This amendment was gazetted in November 2018.

will be granted in addition to (and not as a substitute for) the existing R&D subsidy programs.

II. DESIGNING R&D TAX BENEFITS

A. General Principles

Designing the optimal R&D tax benefits requires two stages.³⁶ In the first stage, the characteristics of the optimal R&D subsidy should be determined, irrespective of whether the subsidy is granted through the tax system, given as a cash subsidy, or provided through other mechanisms such as allocation of legal rights. Various questions should be considered in designing the optimal subsidy.³⁷ In the second stage, institutional design considerations should be evaluated to determine whether granting the subsidy should be provided through the tax system or through other subsidy schemes.³⁸ In general, a tax subsidy is, in substance, a spending program administered through the tax system.³⁹ It is generally possible to structure a spending program (for example, cash grant program) that would be economically equivalent to a tax benefits program and vice versa.⁴⁰ Therefore, whether the subsidy should be granted as a tax benefit or as a cash grant largely depends on the government agency that would be the best choice for administering the program.⁴¹

³⁶ Noked, *supra* note 6, at 143.

³⁷ As discussed in detail in Noked, *supra* note 6, at 143, these questions include, among others, the following questions: “What kinds of activities and investments should the subsidy promote? Should the subsidy be granted only to successful R&D? What would be the optimal timing for granting the subsidy? Should the subsidy treat mobile and immobile capital differently? Should different incentives be granted to MNEs and smaller domestic firms?” These considerations are discussed in section C below.

³⁸ Weisbach & Nussim, *supra* note 8.

³⁹ This is the main conclusion of the extensive literature on tax expenditures. *See*, for example, Stanley S. Surrey, *Tax Incentives as a Device for Implementing Government Policy: A Comparison with Direct Government Expenditures* 83 HARV. L. REV. 705 (1970) and the subsequent literature. *See also* Joint Committee on Taxation, United States Congress, *Estimates of Federal Tax Expenditures for Fiscal Years 2016-2020* (Jan. 30, 2017) (“Special income tax provisions are referred to as tax expenditures because they may be analogous to direct outlay programs and may be considered alternative means of accomplishing similar budget policy objectives. Tax expenditures are similar to direct spending programs that function as entitlements to those who meet the established statutory criteria.”).

⁴⁰ Nussim & Sorek, *supra* note 10. This is further discussed in section C below.

⁴¹ Weisbach & Nussim, *supra* note 8.

As tax benefits for R&D are only a part of a broader set of possible alternatives for government support for R&D, the tax benefits for R&D should be designed and evaluated as part of a broader evaluation of the alternative R&D-related policies. As the fiscal resources that the Hong Kong government can provide to the high-tech industry are limited, the Hong Kong government should conduct cost-benefit and cost-effectiveness analyses for each subsidy, including tax benefits.⁴² As part of these analyses, all subsidies, including tax benefits, should be evaluated and compared. This will ensure that the alternative policies are assessed under the same methodology and that the most cost-effective policies are adopted. It will also ensure that the chosen policies are coordinated, so that there is no unintended “double dipping”⁴³ or other inefficiencies because of uncoordinated policies designed and administered by separate governmental bodies.

Under the organizational structure of the Hong Kong government, the ITB leads the overall policy setting with respect to R&D in Hong Kong,⁴⁴ whereas the FSTB develops the tax-related policies. This Article recommends that the evaluation and design of all R&D-related policies should be integrated, and not divided between separate parts of the government based on the choice of instrument.

B. Should R&D Subsidies Be Structured as Tax Benefits?

A key question is whether an R&D subsidy—whatever its characteristics may be—should be structured as a tax benefit administered by the IRD or as a cash subsidy administered by a

⁴² In general, according to Cass R. Sunstein, *Financial Regulation and Cost-Benefit Analysis*, 124 *YALE L.J. F.* 263, 264 (2015), a cost-benefit analysis involves “an effort (1) to quantify the anticipated consequences of regulatory action and (2) to monetize those consequences in terms of benefits and costs, subject to (3) a feasibility constraint, meant to acknowledge that some consequences may be hard or impossible either to quantify or monetize.” A cost-effectiveness analysis involves comparing alternative regulatory actions with the same desired outcome. See Circular A-4, United States Office of Management and Budget 10-11 (Sept. 17, 2003) for a detailed discussion.

⁴³ This means a situation where a company receives multiple subsidies. Of course, it is possible that the government intends that companies will be able to receive multiple subsidies. “Double dipping” is problematic where the government did not intend that companies will receive multiple subsidies, and it results in a subsidy too high.

⁴⁴ ITB, https://www.itb.gov.hk/en/about_us/role.html (last visited Nov. 16, 2018) [<https://perma.cc/HF24-TSC4>] for the goals of the ITB.

specialized agency (e.g., the ITF). The answer largely depends on the government agency that would be administering the program.⁴⁵ In recent publications, tax policy scholars have argued that the tax authority is largely not suited to designing and implementing R&D-inducing mechanisms, and that R&D-inducing tax incentives should generally be repealed and replaced by cash transfer programs, managed by specialized government agencies.⁴⁶ This section discusses the reasons why a specialized government agency would be superior to the IRD in administering a subsidy program for R&D.

According to Nussim and Weisbach, the institutional design considerations include specialization (i.e., which agency has the expertise required for administering the relevant activities?) and coordination (among the activities of the preferred agency, and the activities of other agencies).⁴⁷ In addition to specialization and coordination, this Article discusses three additional relevant considerations: (i) institutional flexibility and the ability to make changes in the design of the subsidy; (ii) institutional ability to operate within a budget; and (iii) compliance and administrative costs.

Specialization. There is no complementarity between R&D-inducing programs and the IRD's activities and capabilities.⁴⁸ The IRD has expertise in assessing taxable income; it does not have any scientific and technological expertise in R&D. This lack of expertise is more problematic in situations where the agency administering the benefits program should exercise discretion that requires expertise. It is possible to staff the IRD with experts who have the relevant expertise or to liaise with experts from other governmental departments,⁴⁹ but it is unclear why the IRD should

⁴⁵ Weisbach & Nussim, *supra* note 8.

⁴⁶ Shay et al., *supra* note 5, at 455, (suggesting repealing R&D tax incentives and shifting "revenue savings to direct expenditures for peer-reviewed R&D proposals oriented toward basic R&D and risky development R&D"); Nussim & Sorek, *supra* note 10, at 30 (stating that "[t]he general conclusion is that public tasks of fostering innovation should not be allocated to the tax agency. The tax authority is largely not suited for designing and implementing innovation-inducing mechanisms. Innovation-inducing tax incentives should be generally repealed and replaced by cash transfer programs, managed by government agencies that specialize by subject-matter.").

⁴⁷ Weisbach & Nussim, *supra* note 8, at 983-996.

⁴⁸ Nussim & Sorek, *supra* note 10, at 76-77.

⁴⁹ The recent legislative amendment, *supra* note 2, authorizes the IRD to consult with the Commissioner for Innovation and Technology in determining whether R&D expenditures qualify for the enhanced deduction.

be preferred over a specialized agency. If the tax authority does not have experts who can exercise such discretion, and the subsidy must be administered through the tax system, this would likely confine the possible subsidies to nondiscretionary or minimally-discretionary subsidies, such as a super deduction or a tax credit for R&D expenses.⁵⁰ This would be suboptimal if the optimal subsidy involves exercising discretion.⁵¹ Moreover, even nondiscretionary subsidies, such as super deductions and tax credits, could be better handled by a specialized agency than the IRD. International experience shows that where an R&D tax benefit is offered, many companies have re-labeled various expenses as R&D expenses to claim the tax benefit.⁵² A specialized agency will likely be more accurate and cost-efficient than the IRD in determining the claims that are for real R&D expenses and that should be subsidized, and the ones that should not qualify for the subsidy. The IRD has more expertise in detecting other types of fraud (for example, falsified expenses that have never been incurred) through tax audits, although the IRD conducts these audits for tax purposes irrespective of the agency that administers the R&D subsidies.

Coordination. In general, where there are R&D-inducing schemes both inside and outside the tax system, there are coordination challenges and costs from coordinating tax incentives and cash transfers for R&D.⁵³ The Hong Kong government already provides subsidies such as the schemes administered by ITF and Cyberport. If tax benefits are offered in addition to these subsidy schemes, there should be coordination between the IRD and the relevant government agencies. Coordination is required as part of the design stage to ensure that the intended benefits are provided, and to prevent “double dipping” where participants receive more

⁵⁰ *Id.*

⁵¹ See, e.g., Shay et al., *supra* note 5, at 426 (arguing that discretionary incentive programs are likely more efficient than open-ended programs).

⁵² See, e.g., Chen et al., *Notching R&D Investment with Corporate Income Tax Cuts in China* (NBER Working Paper No. 24749), <https://www.nber.org/papers/w24749> [<https://perma.cc/CV5W-WHFM>], and other studies cited there. In this study of an R&D tax benefits program in China, the authors found evidence that up to 45% of the reported increase in R&D was due to the re-labeling of administrative expenses. The companies in this program were pre-approved by this selective program after they met certain criteria, which include conducting R&D. The magnitude of re-labeling could have been much higher if the tax benefits were offered to companies on a non-selective basis.

⁵³ Nussim & Sorek, *supra* note 10, at 76.

benefits than intended by the government. Coordination may also be required in the administration of the various programs, depending on the specific rules of each one.⁵⁴ If all the benefits were designed and administered through one specialized agency (e.g., the ITF), then the coordination of the programs would be more efficient and less costly.

Flexibility and the ability to make changes. Making changes in a subsidy scheme designed and administered through a specialized agency is likely to be easier than making changes in benefits that are provided under legislation, such as tax legislation. The experience of the United States with its R&D tax credit is an example of tax benefits that are unlikely to change, mostly due to political considerations.⁵⁵ As there is a risk that R&D benefits might be found to be ineffective or too costly, the ability to make changes is especially important. Investors may be more willing to rely on a “stickier” program that is harder to change or repeal, although it is possible to provide certain protections and guarantees to participants in programs administered by a specialized agency.⁵⁶ Another reason to support flexibility is identified by Shay, Fleming, and Peroni, who argue that weaknesses in specifying the objective for an innovation incentive should bias the choice of instrument toward an individualized government-set incentive incorporating peer review, that is directed at both basic R&D, and R&D that is subject to experimental risk.⁵⁷

Ability to operate within a budget. A subsidy administered by a specialized agency typically has a fixed budget, and there are limits to the agency’s ability to obtain additional funding beyond the allocated budget. To be able to operate within a budget, a specialized agency typically has the discretion to manage its spending so that it spends the allocated budget only. The IRD, when it administers tax benefits provided under the tax law on an

⁵⁴ For example, if a company that receives a cash subsidy is not eligible for a particular tax benefit, then the IRD and the relevant specialized agency needs to cooperate in order to ensure compliance with this requirement.

⁵⁵ For a discussion on the political issues concerning R&D tax credits, see Shay et al., *supra* note 5, at 420-421 (“The political popularity of supporting R&D tax incentives within the Washington, D.C. ‘Beltway’ is the tax equivalent of embracing motherhood and apple pie”).

⁵⁶ For example, the government can be contractually bound to provide a certain subsidy to a company under a contract between the government and that company.

⁵⁷ Shay et al., *supra* note 5, at 426.

open-ended basis, does not have the discretion to reduce tax benefits if the total cost of these tax benefits exceeds a certain threshold. Therefore, it is harder to control the rising costs of a tax subsidy program than those of a direct spending program.⁵⁸ In theory, it is possible to structure a budget constraint into a tax benefit, so that there will be a mechanism that will provide for certain adjustments to the tax benefits, ensuring that the total expenditure does not exceed the allocated budget. However, the reality of enacting such a mechanism may not be feasible, and structuring the subsidy as a tax benefit might confine the feasible design options to an open-ended benefit that is harder to manage fiscally.

Compliance and Administrative Costs. Assume that the Hong Kong government decides to introduce a nondiscretionary subsidy for R&D expenses. Would it lower the compliance and the administrative costs if this benefit were administered as a cash subsidy by a specialized agency (e.g., the ITF) or as a refundable tax credit by the IRD? The main compliance cost for companies claiming this benefit is the cost of preparing and filing the form claiming the R&D subsidy. This cost appears to be similar irrespective of whether the subsidy is administered by a specialized agency or the IRD.⁵⁹ The IRD or the specialized agency should review the form and confirm that the expenses are real R&D expenses that qualify for the benefit. As discussed above, a specialized agency is likely to be more accurate and cost-effective in determining which claimed expense is a real R&D expense. The IRD already has a mechanism of providing tax refunds to taxpayers that have overpaid their taxes. Creating a payment system for a specialized agency would likely result in higher costs. As an alternative, the specialized agency could utilize the IRD's payment mechanism for this purpose. In any case, in a jurisdiction with a world-class financial system such as Hong Kong, the cost of processing periodic payments to the eligible companies should not be high. Thus, it is unclear whether the compliance and administrative costs would be substantially different if a subsidy were administered by the IRD or by a specialized agency.

⁵⁸ This is one of the critiques raised in the tax expenditure literature. See text accompanying *supra* note 39.

⁵⁹ It does not appear to make a difference if this filing is done as part of the relevant company's tax return or in another form that is filed with the specialized agency.

Wang's argument in support of tax benefits for R&D assumes that cash subsidy programs have a relatively narrow target whereas tax benefits can be made more widely available.⁶⁰ Although this is an accurate description of some subsidy programs and tax benefits, this cannot be accepted as a general assumption regarding the possible instrument design options. Following Nussim and Sorek, it is generally possible to structure a spending program that would be economically equivalent to a tax benefits program and vice versa.⁶¹ There is no reason why a specialized agency cannot administer a widely-available cash R&D subsidy.⁶² Wang, citing another commentator, notes that grant programs "usually suffer from a higher degree of bureaucratic discretion and are less effective in encouraging long-term research because the availability of grants depends on the adequacy of relevant funding, and grant allocation often operates on a yearly cycle."⁶³ This descriptive observation regarding the bureaucratic discretion of some existing subsidies does not reflect a necessary design feature of a subsidy administered by a specialized agency; such an agency can administer a nondiscretionary benefits program with little bureaucracy. Regarding the availability of funding, as discussed above, it is unclear whether the benefits from investors' greater reliance on a tax benefit exceed the social cost from a lower ability to make changes in the subsidy and to operate within a budget.

In summary, from an institutional design perspective, a specialized agency appears to be superior to the IRD in designing and administering R&D incentives. The advantage of a specialized agency is larger where the subsidy involves more discretionary elements. Even where the subsidy is nondiscretionary, administering it via a specialized agency still has the advantages of expertise (e.g., the expertise to determine which claimed expenses are real R&D expenses), lower coordination costs, more flexibility to make changes in the subsidy, and greater ability to operate within a budget.

⁶⁰ Wang, *supra* note 3, at 150, 167.

⁶¹ Nussim & Sorek, *supra* note 10, at 58.

⁶² For example, a refundable tax credit administered by the IRD can be easily replaced by a cash subsidy from the ITF.

⁶³ Wang, *supra* note 3, at 150; Robert Hamilton, *Tax Incentives and Innovation: The Canadian Treatment of R&D*, 19 CAN.-U.S. L. J. 233, 239-240 (1993).

In addition to institutional design considerations, another important consideration is company preference: do companies prefer to receive a tax benefit or an economically-equivalent non-tax subsidy? Because of recent international tax reforms that are part of the OECD's BEPS project, MNEs are better off if they receive cash subsidies and other non-tax subsidies instead of tax benefits, even if the subsidies and the tax benefits are economically equivalent.⁶⁴ If an MNE receives income tax-free in Hong Kong as a result of a tax benefit, then there is a risk that other countries will impose a tax on that income. This risk would be lower if MNEs paid tax on their income and received a cash subsidy equal to the tax paid. As MNEs are better off if they receive non-tax subsidies, countries are likely to attract more MNE investment if they replace existing tax benefits with economically equivalent cash subsidies.

C. Evaluation of R&D Tax Benefits in Hong Kong

As discussed above, the Hong Kong government has recently enacted legislation providing a super deduction for R&D expenses. As a deduction is only valuable for taxpayers that have taxable income, Wang proposes an additional refundable tax credit.⁶⁵

This section evaluates the newly adopted super deduction and the proposal for a refundable tax credit. As part of this analysis, we should determine whether the characteristics of these subsidies are optimal, regardless of whether they are delivered as tax benefits or as cash subsidies. Afterwards, we should determine whether subsidies with these specific characteristics should be structured as tax benefits or cash subsidies.

A super deduction typically has the following characteristics: (i) the subsidy is calculated as a proportion of an

⁶⁴ Noked, *supra* note 16. The international tax reforms under the OECD's BEPS project create incentives for MNEs to prefer cash subsidies over tax benefits. An MNE's country-by-country report (BEPS Action 13) would show higher taxes paid (and thus a higher effective tax rate) in the relevant jurisdiction if the MNE receives a subsidy instead of a tax benefit, and therefore the MNE would face a lower risk of being scrutinized by other tax authorities for income shifting to a low- or no-tax jurisdiction. Other BEPS reforms that create this incentive include stronger controlled foreign corporation rules (BEPS Action 3), greater scrutiny over harmful tax practices, and spontaneous exchange of tax rulings (BEPS Action 5).

⁶⁵ Wang, *supra* note 3, at 166-67.

R&D expenditure made by the recipient; (ii) the subsidy usually involves matching;⁶⁶ (iii) this benefit is typically nondiscretionary or minimally discretionary—any business that meets the requirements of the subsidy can claim the benefits, without a selection process;⁶⁷ (iv) this benefit is granted once a year, during the year after incurring the qualifying R&D expense; (v) qualifying R&D expenses typically include expenses on labor and equipment for R&D; (vi) it is possible to limit the qualifying R&D expenses to incremental, additional expenses (i.e., above a certain threshold of “baseline” expenses) or to provide the subsidy to all R&D expenses;⁶⁸ (vii) the benefits are typically open-ended—granted to any eligible business for its qualifying R&D expenses—without a budget constraint; and (viii) the subsidy is capped at the tax liability of the recipient in the relevant year, and it is typically possible to carry over the subsidy to the following year(s); receiving it in the following year(s) is subject to the same cap of the tax liability in the future year(s).

Refundable tax credit’s characteristics are generally similar to a super deduction with one difference—a refundable tax credit is not subject to a similar cap on the maximum subsidy amount, and if the refundable tax credit exceeds the tax liability the excess is paid by the government in cash.⁶⁹

It is unclear whether these characteristics optimize the spillovers from R&D in the most cost-effective manner. The characteristics of a super deduction favor companies with taxable income in Hong Kong, and do not benefit foreign companies that do not have substantial taxable income in Hong Kong, neither do they

⁶⁶ For example, assume that the tax rate is 15%, there is a super deduction of 200% and the subsidy recipient incurs a qualifying expense of 10. The recipient also has taxable income that exceeds 20. In this example, the super deduction would be of 20 (200% of 10) and the tax savings would be 3. In other words, the investor invests 10 and receives 3 from the government. Another way to describe it would be that the investor’s net investment is 7 and the government’s investment is 3—this is the required matching ratio.

⁶⁷ It is possible to add discretionary elements; however, as discussed above, administering a subsidy program by the tax authority creates a preference for nondiscretionary or minimally-discretionary rules. See text accompanying *supra* notes 50 and 51.

⁶⁸ For Wang’s discussion on incremental and volume-based tax credits, see Wang, *supra* note 3, at 166-67. Similar limits can be structured in super deductions. The new super deduction in Hong Kong is not limited to expenses above a certain threshold.

⁶⁹ It is possible to set a cap on the maximum refundable tax credit as part of the design of the terms of this tax benefit.

benefit start-up companies that typically have losses in their early stages of operation. Most foreign companies, including MNEs, do not have substantial taxable income in Hong Kong, and even if they conduct R&D in Hong Kong such activity will not result in a high tax liability in Hong Kong.⁷⁰ Therefore, these tax benefits are unlikely to result in a significant increase in foreign investment in R&D in Hong Kong. Foreign companies can potentially benefit from the super deduction to offset their income from IP if they register in Hong Kong the IP that they developed there, and if such IP generates income. However, it is questionable if companies (especially MNEs) would find this option attractive considering the BEPS international tax reforms, which create incentives to avoid locating IP and receiving tax-free income from royalties in a low tax jurisdiction such as Hong Kong. In addition, these tax benefits are unlikely to support start-ups that typically generate losses at their early stages and are subject to significant credit constraints.⁷¹

⁷⁰ A typical setup of an R&D center setup is described by the OECD Transfer Pricing Guidelines for Multinational Enterprises and Tax Administrations, 111-16 (2017): “Company A of an MNE group agrees with company B of the same MNE group to carry out contract research for company B. All risks related to the research are assumed by company B. This company also owns all the intangibles developed through the research and therefore has also the profit chances resulting from the research.” According to the OECD, this is a typical setup for applying the cost-plus method, according to which the taxable income equals the R&D center’s expenses plus a small profit margin, usually calculated as a percentage of the expenses. This way the R&D center is typically taxed only on a small and arbitrary profit, which may be smaller than the actual contribution of the R&D activities to the MNE’s overall profits. The IP developed by the R&D center under this arrangement is typically registered in another jurisdiction, so Hong Kong does not tax the proceeds of such IP. In addition, investors who make capital investments in start-ups, with no trading intent, are not subject to tax in Hong Kong on their capital gains when the start-up is sold or issued to the public. Therefore, MNEs, venture capital funds, angel investors and other investors that all typically hold their investments in start-ups for a few years, are not taxed on their gains. In the case of a loss, the investors cannot offset capital losses from failing investments against taxable income from other sources in Hong Kong. In addition, Hong Kong does not impose withholding on dividend payments to foreign investors. Therefore most foreign companies, including tech MNEs, who invest in R&D in Hong Kong do not have substantial tax exposure in Hong Kong.

⁷¹ Susan C. Morse & Eric J. Allen, *Innovation and Taxation at Start-up Firms*, 69 TAX L. REV. 357, 358 (2016) (“We suggest that, under reasonable assumptions for endowment, burn rate, and probability of success over time, a new start-up would rationally decide not to make a material investment in tax planning to eliminate income tax on any future profits. Later in a firm’s life, when it has a larger endowment and a higher probability of success, the analysis shifts and there is a greater incentive to invest in tax planning. Our argument that income tax breaks for entrepreneurship or innovation should not be expected to motivate the desired behavior at new start-up firms contrasts with frequent and broad recommendations for the adoption of such tax breaks”).

Refundable tax credits, which are similar to a cash subsidy with a matching requirement, would be available to companies with no taxable income in Hong Kong, but the costs of such a scheme might be significantly higher. These costs would include larger enforcement costs, and costs of tax fraud because companies would have a stronger incentive to engage in re-labeling and false reporting as they can receive a cash grant from the government on a nondiscretionary basis by claiming expenses as R&D expenses.

In addition, the empirical evidence on the impact of the R&D tax credits and super deductions raises concerns about whether these tax subsidies are cost-effective. After reviewing the empirical evidence on R&D tax incentives, Graetz and Doud concluded that the empirical evidence suggests that “R&D tax incentives may increase the amount of R&D and the number of R&D employees but their cost-effectiveness is less certain than their advocates claim The efficacy of R&D incentives often turns on their structure, size, and scope. Whether current incentives are cost-effective . . . remains uncertain.”⁷² Another study on R&D tax incentives stated that “[s]tudies that are more rigorous find that one euro of foregone tax revenue on R&D tax credits raises expenditure on R&D by less than one euro.”⁷³ In the light of the empirical evidence and the considerations discussed above, it is questionable whether the characteristics of super deductions and tax credits are optimal.

In addition to these general considerations, the Hong Kong government should adopt a policy that addresses the problems and challenges that are specific to Hong Kong. To determine the characteristics of the optimal R&D subsidy, the Hong Kong government should first discover why private investment in R&D in Hong Kong is relatively low, and the steps that they can take to increase local and foreign investment in Hong Kong’s high-tech sector.⁷⁴ It is unclear whether such an analysis was conducted prior to passing the legislation granting a super deduction.

⁷² Michael J. Graetz & Rachael Doud, *Technological Innovation, International Competition, and the Challenges of International Income Taxation*, 113 *Colum. L. Rev.* 347, 395-401 (2013).

⁷³ CPB Netherlands Bureau for Economic Policy Analysis, *supra* note 13.

⁷⁴ It is possible that one of Hong Kong’s main challenges when developing the high-tech sector is a shortage of engineering talent. *See* section II.D below for alternative subsidies which focus on developing the local talent pool.

Moreover, even if a super deduction or a tax credit has the characteristics of an optimal subsidy for R&D in Hong Kong, it would be more efficient to structure such subsidy as a cash subsidy administered by a specialized agency, as discussed in section B above. The advantages of structuring such a subsidy as a tax benefit administered by the IRD are unclear. It is possible to design a subsidy economically equivalent to a super deduction by limiting the maximum annual subsidy to the annual tax liability of the relevant recipient and allowing a carry-forward of the amount above that cap to future years. A refundable tax credit can be structured as a cash subsidy with a matching requirement. As discussed above, even where the subsidy is nondiscretionary, administering it by a specialized agency still has advantages of expertise (such as the expertise to determine the claims that are for real R&D expenses), lower coordination costs with other subsidy schemes, a greater ability to make changes in the subsidy, and a greater ability to operate within a budget. It is unclear whether the compliance and administrative costs would be different if a subsidy were administered by the IRD or by a specialized agency. In addition, as MNEs have reasons to prefer subsidies over tax benefits because of BEPS, Hong Kong may be able to attract more MNE investment if it adopts cash subsidies instead of economically-equivalent tax benefits.

To conclude, the characteristics of super deductions and tax credits for R&D expenses are unlikely to be optimal, and even if they were, economically-equivalent cash subsidies administered by a specialized agency are likely to be superior to them.

The Hong Kong government should monitor the impact of the new super deduction and assess after a period of time whether this tax benefit results in a substantial increase in the R&D investment in Hong Kong. Analysts should be wary of companies re-labeling various expenses as R&D expenses, a documented phenomenon in other countries that grant tax benefits for R&D expenses. This might create a false impression that the private investment in R&D is growing while this reported growth might be explained, at least in part, as re-labeling of non-R&D expenses as R&D expenditures. This Article predicts that the new super deduction is unlikely either to attract substantial foreign investment in domestic R&D or to boost the growth of start-ups in Hong Kong.

More data, which will become available over time, is needed to assess whether this prediction is correct.

D. Alternative Policies

This section considers alternative subsidies that may be superior to super deductions, tax credits, and economically-equivalent cash subsidies. In general, investment in human capital likely generates much of the domestic spillovers associated with R&D.⁷⁵ If the Hong Kong government could incentivize companies to provide more training and work experience to employees in R&D positions, then this would likely result in large positive spillovers. Some countries provide cash subsidies or tax benefits for investment in human capital and for the payment of salaries to R&D employees.⁷⁶ If the largest spillovers from investment in human capital are generated in each employee's first few years of R&D employment, it is possible to limit the subsidy to that period by granting a subsidy to companies that hire university graduates for their first R&D jobs.⁷⁷ The ITF already provides a subsidy for internship programs.⁷⁸ It is possible to create another subsidy scheme for R&D employees. In addition, attracting a handful of tech MNEs could have a significant impact on the local economy's growth because these MNEs can train a substantial number of local

⁷⁵ Noked, *supra* note 6, at 145. This is because it increases employment in high paying jobs; it improves human capital by providing training and experience, which can create value even after the employees leave the company that trained them; it has a positive impact on tax revenues collected based on both the workers' personal income and their consumption.

⁷⁶ Some European countries, including the Netherlands, Belgium, and Hungary, have enacted employment tax benefits for employing R&D workers, which include tax credits for R&D salary costs, payroll tax deduction, and exemption for withholding tax on salaries to researchers. See Graetz & Doud, *supra* note 72, at 354. In addition, Israel offers employment grants, calculated as a percentage of the employees' salaries, to foreign companies that open R&D centers in specific areas in Israel, and to companies that hire certain employees. R&D Centers: Investment Models in Israel, at 28-29, http://investinIsrael.gov.il/HowWeHelp/downloads/R_D.pdf [<https://perma.cc/RBB8-J9P7>] (last visited Nov. 16, 2018).

⁷⁷ Noked, *supra* note 6, at 145. During these early years of professional development, the company has to invest in training the worker to increase her skills and productivity. After gaining valuable experience, the worker might be more attractive to other companies that would hire her without any subsidy. Alternatively, she might be able to start her own company.

⁷⁸ ITF, <http://www.itf.gov.hk/1-eng/GSP-IP.asp> [<https://perma.cc/5DKH-TU47>] (last visited Nov. 16, 2018).

employees and contribute to the development of a specialized hub. This explains why some governments compete over MNE investments and offer MNEs direct grants, land-use rights, tax benefits, and other incentives.⁷⁹ The Hong Kong government can negotiate with selected MNEs and offer them benefits in exchange for meeting certain employment targets.

The existing subsidy schemes provided by the ITF should be evaluated. It is possible that the budgets of some existing schemes should be increased. It is also possible that the existing programs do not live up to their full potential and could be improved by reducing bureaucracy, providing more guidance to applicants, increasing transparency, simplifying the application process, and expediting the review process of applications.

III. CONCLUDING REMARKS

This Article stresses the importance of choosing the most cost-effective instrument to support the development of Hong Kong's high-tech industry. The Hong Kong government should analyze the challenges and problems of Hong Kong's high-tech sector and decide the steps it can take to support its growth. After the necessary analysis has been conducted, the government should develop its R&D policy with a comprehensive approach that does not divide the development of policies between separate parts of the government based on the type of instrument.

The analysis in this Article suggests that a cash subsidy provided by a specialized agency such as the ITF would likely be superior to providing a super deduction through the tax system, even if the cash subsidy and the tax benefit are economically equivalent. The tax policy literature and the empirical evidence raise serious doubts about whether a super deduction would be the optimal measure for increasing R&D investment. Instead of foregoing tax revenues to fund a super deduction, the Hong Kong government should consider using these resources to fund other, more cost-effective subsidies. It should consider subsidies that target investment in human capital and attract selected MNEs, and it should also consider improving the existing subsidy schemes.

⁷⁹ Noked, *supra* note 6, at 154.