Designing a Tax System that Encourages Innovation in Start-ups*

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Abstract

This study examines whether Japan's tax system is efficiently designed to promote innovation in start-ups.

First, we explore the justification for tax incentives to promote innovation. Tax incentives can be justified when one of the following exists: (1) an undersupply of innovation due to its positive externality; (2) restrictions on start-ups' access to financing due to information asymmetry; and (3) structural distortions of the basic tax system due to the progressive tax rate structure, the double taxation of corporate profits, and the realization principle of capital gains taxation. Next, we highlight some pressure points to consider when designing tax incentives for innovation by referring to theoretical studies and developments in tax policy and practices in the United States.

The challenges of Japan's tax policy for innovation include the following: (1) start-ups seldom benefit from various tax incentives for innovation due to the lack of tax refundability for losses and research and development (R&D) tax credits, which have a limited carryforward period, and strict legislative and judicial restrictions on the transfer of tax attributes; (2) historically layered revisions of the system make it too complicated to be used by start-ups, whose time and financial resources are limited; and (3) the policy on entrepreneurs' entry and exit strategies is inconsistent with the ideal of progressive taxation in the personal income tax system, although Japan's tax system is designed to encourage entry by allowing the conversion of labor income into capital gains on stocks, thereby easing the success tax on entrepreneurs and mitigating the lock-in effect in the exit stage.

Keywords: tax and risk taking, R&D tax credits, Tax Receivable Agreements (TRAs), capital gains taxation, IPO, M&A

JEL Classification: H25, K34, O38

I. Introduction

Governments are tempted to use a tax system as a policy tool for promoting innovation.[1] The promotion of innovation through a tax system can be justified under certain conditions. However, if the design does not adequately account for the basic structure of the existing tax

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system and the characteristics of the innovators, the aim of promoting innovation will not be achieved and will only lead to unnecessary revenue losses and the complexities of the tax system.

This study examines whether Japan's tax system is efficiently designed to promote innovation in start-ups. First, we explore the justification for tax incentives to promote innovation (II). Tax incentives can be justified as a response to market failures, specifically an undersupply of innovation due to its positive externality and restrictions on start-ups' access to financing due to information asymmetry. It is also justifiable to employ tax incentives to address the inefficiencies of the existing tax system resulting from the progressive tax rate structure, the double taxation of corporate profits, and the realization principle of capital gains taxation.

However, even if there are good reasons for using tax incentives, they may not achieve their objectives if they are not appropriately designed. We elucidate some pressure points to consider in designing tax incentives for innovation by referring to theoretical studies and developments in tax policy and practices in the United States (III).

Next, we evaluate Japan's tax policy for innovation (IV). The challenges of Japan's tax policy for innovation include the following: (1) start-ups seldom benefit from various tax incentives for innovation due to the lack of tax refundability for losses and research and development (R&D) tax credits, which have a limited carryforward period, and strict legislative and judicial restrictions on the transfer of tax attributes; (2) historically layered revisions of the system make it too complicated to be used by start-ups, whose time and financial resources are limited; and (3) the policy on entrepreneurs' entry and exit strategies is inconsistent with the ideal of progressive taxation in the personal income tax system, although Japan's tax system is designed to encourage entry by allowing the conversion of labor income into capital gains on stocks, thereby easing the success tax on entrepreneurs and mitigating the lock-in effect in the exit stage. Finally, we summarize our discussion (V).

II. Justification of Tax Incentives for Innovation

II-1. Positive Externalities of Innovation

Tax incentives to promote innovation can be justified when there is a market failure of positive externalities in innovation. Before introducing this discussion, we first confirm that tax neutrality should be ensured in the absence of such a market failure.

II-1-1. Ensuring Tax Neutrality

(1) Neutrality on Risk-taking

Activities for creating innovation involve risks, and most ventures fail. Therefore, in

[1] In this study, "innovation," although difficult to define rigorously, is used to encompass "doing something new or doing what is already done in a new way" (Schumpeter, 1947, p.151). It is essential to delve into the intricacies of the innovation policy quandaries that can be addressed through the tax system and expound upon the methods by which this can be achieved.

principle, it is essential to ensure neutrality of taxation on risk-taking, except in limited situations.[2] Although this point cannot be overemphasized, we only briefly explain it here because it is already widely known. To ensure neutrality on risk-taking in income taxation, it is necessary to tax at a flat rate with full refundability (Domar and Musgrave,1944; Kaplow, 1994; Weisbach, 2004). In other words, the government should be the risk taker's "silent partner" by providing a tax refund at the same tax rate applied to profits in the case of making losses, as a counterbalance to requiring tax payments in the case of making profits resulting from risk-taking. Once this is ensured, taxpayers can replicate the expected pre-tax payoff through portfolio adjustments of risky investments, thus effectively eliminating the tax burden on risk-taking.

(2) Neutrality on Investment Decisions

In income taxation, expensing of investment in fixed assets is usually not allowed, instead, depreciation is required based on the matching principle, which discourages investment. A cash flow tax can achieve neutrality on investment decisions. If it is R-based, real and financial transactions should be distinguished, and only cash flows from real transactions should be accounted for, allowing the immediate deduction of expenses for real investments and denying interest deductions. If it is R+F based, there is no need to distinguish between real and financial transactions; however, debt and equity must be distinguished. In either case, as with income taxation, taxing at a flat rate with full refundability would enable taxpayers to eliminate the effective tax burden on risk-taking through portfolio adjustments (Weisbach, 2004, pp. 21-22). However, taxation of both cash outflow and inflow at a uniform rate is highly unlikely when the timing of investments and earnings are significantly disparate. This is because the tax rate is subject to changes in response to fiscal demand or other policy priorities. As the Cary Brown theorem indicates, tax neutrality on investment decisions can also be ensured by exempting the return on investment from taxation (Brown, 1948). However, it would be undesirable from a tax revenue-maximizing perspective if excess returns from innovation were not taxed under the exemption system (Kohyama, 2019, pp. 157-58).

To ensure neutrality on investment decisions while minimizing optic deviation from the current tax system, true economic depreciation, keeping the interest deduction intact, is a plausible solution (Samuelson, 1964). Even if it is difficult to take this solution from a tax compliance perspective, the same objective can be achieved by introducing a cost of capital allowance (COCA) (Kleinbard, 2005; Kleinbard, 2017) in which a deduction for a deemed normal return on the undepreciated portion of an asset's tax basis is allowed while keeping the existing depreciation method intact. However, the complexity of the existing depreciation methods remains under the COCA, and determining a normal rate of return would be challenging in designing this system (Warren, 2008).

[2] An important exception is when there is an incentive for excessive risk-taking under a limited-liability regime (Nagato, 2019).

II-1-2. Promoting Innovation through Tax Incentives

(1) Tax Preference

When referring to tax "preference," it is necessary to be mindful of our baseline. For example, if income taxation is the baseline, expensing is "preferential" treatment; however, expensing with denial of interest deduction is not "preferential" if we aim for consumption tax and emphasize neutrality on investment decisions (Kohyama, 2019, pp. 338-39). From an income tax perspective, it is even possible to argue that investments in human and intellectual capital, which account for a large portion of R&D expenses, should be capitalized and depreciated (Nakazato, 1998; Kahng, 2014), while an immediate deduction is widely allowed for R&D investments under current law.[3]

Factoring in the international aspect, we can evaluate a cash flow tax as "preferential" even from the perspective of a consumption tax, when taxpayers can expense their investments at a high domestic tax rate while the earnings from the investments are taxed only at a low foreign tax rate. This is accomplished by exploiting cost-sharing agreements and avoiding the application of the controlled foreign corporation tax regime (Shay et al., 2016, pp. 435-39).

(2) Justification for Government Support and Available Policy Instruments

Under certain conditions, it is appropriate for a government to intervene in and support the creation of innovation through the use of taxes and other policy instruments beyond simply ensuring neutrality. A typical case is when a positive externality exists in innovation. Although the social benefits of innovation may be substantial, it will be undersupplied to society if it is left to the market. This is because, in the market, an innovator cannot obtain private benefits that are proportionate to their investment, which carries a high risk of failure. Therefore, it is justifiable for the government to promote innovation by subsidizing the returns earned by innovators or partially bearing the costs of innovative activities through a legal system.

Hemel and Ouellette (2013) provide a comparison of various policy instruments that governments can utilize, including patents, direct spending (grants), prizes, R&D tax credits, and patent boxes (Table 1). The authors argue that these instruments can be structured in an economically equivalent manner and that it is crucial to comprehend the distinct characteristics of each instrument.

Each policy instrument has specific characteristics that can be analyzed in terms of three factors: (1) who decides the target and size of the reward that innovators will receive, (2) when the reward is provided, and (3) who will pay the corresponding costs. For instance, the target and scale of the reward of grants and prizes are determined by the government, whereas the market, especially with regard to the scale, determines for patents (plus patent boxes) and R&D tax credits. If the market has an information advantage over the govern-

[3] In the United States, R&D expenses are capitalized and amortized over five years as of 2022 because of the amendment by the Tax Cuts and Jobs Act of 2017 (TCJA).

ment on the costs and benefits of innovative activities, the latter policy instruments will be better.[4] Regarding the timing, grants and refundable R&D tax credits are available *ex-ante* to any innovator, regardless of success, while prizes and patents (plus patent boxes) are available *ex-post* only to successful innovators.[5] Accordingly, the former is more desirable for start-ups with uncertainty regarding their success and limited capacity to secure funds during the early stage of their operations.[6] Regarding the who pays question, the cost bearers can broadly be classified into two categories: users (consumers) of the innovation and taxpayers in general. Users bear financial costs in patents, whereas the government (taxpayers) generally bears in other instruments.[7] To avoid cross-subsidization, the system could be financed by a targeted sales tax on goods using the innovation.[8]

Table 1. Classification by Hemel and Ouellette (2013)

	Government-set	Market-set
Ex-ante	Direct spending (Grants)	R&D tax credits
Ex-post	Prizes	Patents (+ Patent boxes)

Hemel and Ouellette (2019) deepen their analysis to argue that an *innovation incentive* that promises a market-based reward to innovators and an *allocation mechanism* to distribute them can be separated and that policymakers should consider the optimal combination (*matching, mixing,* and *layering*) of IP and non-IP policy instruments.[9]

In contrast, Nussim and Sorek (2017) pointed out the inadequacy of existing legal studies, including Hemel and Ouellette (2013). According to Nussim and Sorek (2017), prior studies borrow economic frameworks to analyze the difference between cash transfers (grants and prizes) and tax incentives. However, the economic literature, reasonably, does not differentiate between the two because they are economically equivalent. Therefore, it is not useful to distinguish grants and prizes on the one hand, and R&D tax credits and patent boxes on the other. Prior studies are criticized for not comparing these policy instruments from an ideal institutional design perspective but rather focusing on existing instruments that are already in use.[10] Nussim and Sorek (2017) posited that organizational theory allows for a normative choice between cash transfers and tax incentives from a legal perspective, focusing on the difference between the two in terms of implementation costs. The authors

[4] *See* Hemel and Ouellette (2013) at 327-28.
[5] *See id.* at 333.
[6] *See id.* at 334-39.
[7] *See id.* at 345-46.
[8] *See id.* at 347-49.
[9] *Matching* refers to "the pairing of an IP innovation incentive with a non-IP allocation mechanism or vice versa." *Mixing* refers to "the combination of IP and non-IP innovations incentives, or IP and non-IP allocation mechanisms." *Layering* refers to "the use of different policies at different jurisdictional levels, such as using non-IP innovation incentives and allocation mechanisms at the domestic level within an international legal system oriented around IP" (Hemel and Ouellette, 2019, p. 550).
[10] For example, it is noted that there could be a mechanism through which the amount of the prize (characterized as the government-determined size of the support) is determined by market evaluation (Nussim and Sorek, 2017, p. 61).

found that tax incentives should be used to encourage innovation only when it is more advantageous to organize such programs within a tax agency rather than another government agency. They incorporate agency specialization, economies of scope, and (policy) coordination costs between a tax agency and other government agencies to find little advantage in using tax incentives (Nussim and Sorek, 2017, pp. 79-80).

II-2. Constraints to Start-up Financing

The promotion of innovation through a tax system can be justified when there are restrictions on financing due to the information asymmetry faced by start-ups, even in the absence of positive externalities.

II-2-1. Start-ups as Main Players in Innovation

Although established firms may possess financial resources and ease of risk diversification for starting new businesses, their innovative capabilities are not always guaranteed. Conversely, start-ups are often considered the primary innovators, a phenomenon known as the "innovator's dilemma" (Christensen, 1997). Igami (2017) empirically tested this phenomenon. According to economic theory, established firms may have more R&D and financial resources than start-ups, and may choose to acquire start-ups before they develop new technologies and increase their market share. However, if the reduction in revenues due to the substitution of old products by new product development is greater, established firms may be more likely to experience the "innovator's dilemma."

It is common practice for the government to provide support for promoting innovation with a focus on small- and medium-sized enterprises (SMEs). SMEs are typically defined by criteria including stated capital and number of employees. However, it is important to distinguish between SMEs and innovative start-ups. While start-ups are often included in the SME category, the reverse is not true. Hurst and Pugsley (2011) showed that many SMEs in the United States do not have a desire to grow or innovate. Therefore, it is posited that the government's support for promoting innovation should be dispensed based not solely on the firm's size but also on the firm's age (Gale and Brown, 2013). However, even among start-ups, there are two categories: those that utilize existing technology and do not foster innovation and those that are truly innovation-focused. Consequently, it is imperative that tax incentives for innovation are meticulously targeted. Nevertheless, it is challenging for the government to obtain such information in advance. We delve into this situation, when it is not possible for the government to observe whether a start-up is innovation-oriented, in Section III-1.

II-2-2. Constraints to Financing

Information asymmetry exists between start-ups and outside investors with regard to a business' profitability and the ability of its managers, as start-ups have no historical performance record, whereas innovative businesses are inherently new and risky. As per Holtz-

Eakin et al. (1994a, b), individuals are more likely to engage in entrepreneurship or sustain their businesses when they have increased their own wealth through inheritance and reduced their dependence on external financing. These empirical findings demonstrate that entrepreneurs face significant constraints when seeking financing from outside investors during the initial stages of their businesses.

It is widely acknowledged that start-ups in the United States utilize convertible preferred stocks with a preferential distribution of residual assets in the event of liquidation as a financing instrument to overcome information asymmetry and raise funds from venture capitalists. Gilson and Schizer (2003) explain how these financing instruments enable entrepreneurs to avail preferential tax treatments, albeit not intentionally as a tax policy, by reducing the value of common stocks at the time of granting to the entrepreneur and converting labor income into capital gains that are taxed at a lower rate.[11] In Japan, there is a growing body of academic interest in the tax treatment of preferred stocks (Shishido, 2009; Watanabe, 2018).

II-2-3. The Suitability of Complex Tax Incentives for Resource-constrained Start-ups

Morse and Allen (2016) present a compelling analysis of the interplay between financial constraints faced by start-ups and tax incentives. In particular, for start-ups that are resource-constrained and have a low probability of success, the decision to utilize tax incentives, which can only yield benefits when profits materialize, hangs in the balance. This decision depends on whether it is worth expending current limited resources on costly tax planning to reduce tax burden on future profits, which may be low in probability. The crux of this matter is weighing the cost of tax planning, which itself may lower the probability of success, against the benefits of future tax savings. As a result, tax incentives for innovation, such as patent boxes and R&D credits, are likely to fail because start-ups do not utilize them in the early stages prior to securing funds from venture capitalists.

II-3. Impact of the Basic Structure of the Existing Tax System on the Entry and Exit Decisions

II-3-1. Impact on the Entry and Exit Decisions

In Sections II-1 and II-2, we examined situations in which the utilization of tax incentives to encourage innovation is appropriate for addressing market failures. Section II-3 focuses on the basic structure of the existing tax system that either encourages or discourages innovation. We focus on the progressive tax rate structure, the double taxation of corporate profits, and the realization-based capital gains taxation as basic building blocks of the existing tax system. These building blocks can either hinder or promote entrepreneurship entry and exit decisions and may necessitate tax intervention to reduce distortions in the market.

In many countries, income taxes have a progressive tax rate structure, where higher in-

[11] However, Fried and Ganor (2006) argue against incentivizing the use of convertible preferred stocks through tax benefits because agency costs increase when preferred shareholders assume corporate control.

comes are subject to higher marginal tax rates, and tax refunds for losses are infrequent, resulting in asymmetric treatment of profits and losses.[12] Entrepreneurs in the form of a private business are subject to relatively heavier taxation upon success, reducing the incentive to start a business, compared to being employees who do not bear losses (Gentry and Hubbard, 2005).[13] However, offsetting tax losses against other income using pass-through entities could be an option for entrepreneurs, rather than using C corporations, which are subject to corporate taxation and losses remain at the corporate level. Nevertheless, it has been a puzzle that Silicon Valley start-ups usually establish themselves as C corporations from the beginning or convert to C corporations before receiving investment funds from venture capitalists (Bankman, 1994).[14]

In a recent study by Polsky (2019), it was found that the tax compliance costs associated with the pass-through tax rules are exceedingly high for start-ups. One of the primary reasons for this is the significant costs incurred by pass-through entities issuing Form K-1 for tax purposes under a layered investment structure. Furthermore, it is unrealistic to expect start-ups, the majority of which are likely to fail, to issue Form K-1 properly. Moreover, the value of utilizing losses, which is not fully reflected in the pricing of an initial public offering (IPO), is largely dependent on the availability of future earnings, resulting in a low valuation due to a high discount rate. For these reasons, many start-ups choose to be subject to corporate tax and are subject to relatively heavier taxation compared to other entities when they become successful and profitable.

Capital gains taxation based on the realization principle has a significant impact on entrepreneurs' entry and exit as well as financing decisions (Gentry, 2016). The progressive rate structure and loss limitation rules of the capital gains tax, accompanied by the realization principle, discourage entry[15] and increase the cost of capital for taxable investors,[16] particularly for start-ups that require funds from venture capitalists and close angel investors. The lock-in effect of realization-based capital gains taxation is particularly significant for entrepreneurs,[17] as they often do not diversify their investments and cannot easily offset capital gains taxes through portfolio adjustments. In addition, the taxation of capital gains, which arises when entrepreneurs sell their businesses or corporate stocks, is a matter of par-

[12] Nussim and Tabbach (2014) point out that ideal applicable tax rate to losses under a progressive rate structure is an unresolved tax policy issue.

[13] However, Gentry and Hubbard (2005) treat sole proprietors in general as entrepreneurs due to data limitations; therefore, their analysis does not include founders of start-ups, who often use corporate entities (Fleischer, 2011, p. 93). Furthermore, in a corporate form, entrepreneurs may avoid the success tax by taking advantage of a reduced tax rate, particularly in the case of SMEs. However, as many start-ups typically incur losses during their initial stages, it is more advantageous for them not to operate in a corporate form in order to offset losses against other income at the individual level. Moreover, higher individual income tax rates do not discourage risk-taking to the extent that losses can be offset against other income (Cullen and Gordon, 2007). Nonetheless, this analytical framework is criticized for overlooking the fact that many start-ups, in practice, use corporations that are subject to corporate taxation (Fleischer, 2011, pp. 94-95).

[14] Bankman (1994) presents several hypotheses, including cheaper legal fees than using entities that are subject to pass-through taxation, investors' tax-exempt status, the existence of an irrational group of investors who want to show more accounting profits than tax savings, and the existence of path dependency and high transition costs in the venture capital community.

[15] Gentry (2016) at 344-45.

[16] *See id.* at 348-51.

[17] *See id.* at 345-46.

ticular importance, particularly for non-listed firms, because the firm's control is important for their operation.

II-3-2. Conversion of Labor Income into Capital Gains

While it is widely acknowledged that entrepreneurs face a "success tax" and are discouraged from pursuing entrepreneurship, Fleischer (2011) has criticized the preferential tax treatment afforded to entrepreneurs. Specifically, he notes that the taxation of founders' or venture capitalists' stock holdings converts labor income, which should be taxed as ordinary income, into lightly taxed capital gains. This, in turn, leads to regressive taxation that cannot be justified by the positive externality of innovation. The mechanism is as follows (Fleischer, 2011, pp. 81-87). In a sweat equity arrangement, a founder contributes a minimal amount of capital and renders extensive labor to acquire common stocks, whereas venture capitalists provide a substantial sum of money to obtain convertible preferred stocks. This arrangement enables the entrepreneur to receive as little cash remuneration as possible, avoiding taxation on the imputed income derived from their labor, and enabling them to direct their pre-tax income directly into their own company's stocks. This privilege conveys an advantage over ordinary wage earners, who receive cash compensation for their labor from the job market and invest their after-tax earnings in stocks.

Entrepreneurs generally choose to be taxed on their common stocks as ordinary income at fair market value upon grant pursuant to Section 83(b) of the Internal Revenue Code (IRC) rather than deferring taxation until the stock vests. This is because of the widespread practice that the option value of stocks is significantly undervalued at the time they are granted. Thereafter, they can benefit from tax deferral under the realization principle until the stocks are sold. Furthermore, even if they sell, their capital gains are taxed at a preferential rate. In addition, they can even avoid capital gains taxation entirely by taking advantage of the step-up in basis at deaths (Section 1014 of the IRC).

II-3-3. Estimates of Entrepreneurs' Tax Burden

Toder (2020) estimated the effective federal tax rate on successful entrepreneurial income in the United States. In his model, the effective tax rate on entrepreneurial income is calculated as the combined effective tax rate on the capital gains of stocks and profits at the corporate level. His model is useful for the purposes of this study because it aligns with two of the three key features that this study focuses on, specifically the double taxation of corporate profits and the realization-based capital gains taxation. Toder (2020) briefly mentions the characteristics of a success tax due to the loss limitation rules outside his model.

The estimated effective tax rate on capital gains of stocks ranges from 8.4% to 15.9%, based on a statutory tax rate of 23.8%, realistic numbers for the risk-adjusted discount rate, and number of years to exit.[18] The corporate-level taxation of profits varies from -10.3% to 12.9%, and is influenced by several factors, including the effective corporate tax rate, which

[18] Toder (2020) at 1224-25.

tend to be lower for multinational corporations shifting profits to foreign jurisdictions. In addition, the marginal tax rate on capital gains is zero when shareholders are tax-exempt entities and the debt-to-equity ratio can also impact the effective tax rate.[19] The combined effective tax rates for the lowest, medium, and highest estimates are -4.4%, 11.8%, and 30.9%, respectively, which are below the maximum personal income tax rate of 37%.[20] Toder (2020) notes that the entry decision, including entry via immigration, does not necessarily have a significant impact on the decision to start a business, considering the significant income an entrepreneur can earn if they are successful.[21] It is also noted that these estimates are only for successful entrepreneurs, and that the effective tax rate on the expected profits from entrepreneurship would generally be higher due to the loss limitation rules.[22]

III. Design of Tax Incentives to Promote Innovation

III-1. Tax Incentives Targeting Start-ups

We delve into the design considerations associated with tax incentives to promote innovation. In a world without market failures, innovation occurs efficiently through a neutral tax system that applies a uniform tax rate to gains and losses regardless of whether taxpayers are entrepreneurs. However, this is not the case in a world with market failures. Gordon and Sarada (2018) examine the design of a tax system in the context of market failures resulting from positive externalities of innovation and constraints on financing for start-ups. In their model, some start-ups are truly entrepreneurial, while others are not, but the government is unable to distinguish between the two based on limited observable information. The authors discuss the implementation of a tax system that encourages innovation by the former type of start-ups under these circumstances.

In the context of the first market failure of positive externalities from innovation, Gordon and Sarada (2018, pp. 5-6) assume that non-entrepreneurial start-ups engage in risk-free activities, while truly entrepreneurial start-ups engage in innovative activities involving high risk. The authors argue that the former earn stable revenues from existing technology, while only the latter incur losses due to large initial investments in innovation. To address the issue of undersupply of innovation through the tax system, they propose a more lenient treatment of tax losses, which would only be incurred by entrepreneurial start-ups, rather than a reduction in the tax rate on profits, which would likely benefit only non-entrepreneurial start-ups with stable profits.[23] Specifically, their recommendations include granting refundability or trading of tax losses for start-ups.

With respect to the second market failure of information asymmetry, there are essential-

[19] *See id.* at 1226-27.
[20] *See id.* at 1227-28.
[21] *See id.* at 1228.
[22] *See id.* at 1228-29.
[23] The same framework is used to discuss the market failure relating to the benefits to consumers from new products brought about by innovation.

ly two types of constraints that start-ups face when seeking funding: equity-market constraints and debt-market constraints (Gordon and Sarada, 2018, pp. 4-9). In the equity market, start-up managers, who are assumed to be risk-averse, must choose between incurring the initial *start-up costs* and risks of developing a new technology to run innovative start-ups (defined as *risk-bearing costs)* or utilizing existing technology to generate stable profits. *Entrepreneurs*, defined as those who opt for the former, will only do so when the expected increase in profits from the new technology exceeds the sum of the *start-up costs* and *risk-bearing costs*. When a start-up raises funds through equity, outside investors are unable to directly observe the manager's skills,[24] and the percentage of stocks sold serves as a signal of the entrepreneur's managerial ability. Specifically, a higher ratio of stocks offered for sale indicates a lower perceived level of managerial skill on the part of outside investors, and this signaling effect discourages entrepreneurs from reducing their *risk-bearing costs* by increasing the proportion of stocks sold to outside investors, who can diversify risks. Given the *risk-bearing costs* involved, an entrepreneur developing a new technology would opt for a less risky venture compared to a scenario without information asymmetry. This would result in a lower number of entrepreneurs developing innovative technologies, despite the fact that the risk could be diversified, and the *risk-bearing costs* could be reduced to zero for outside investors and the government. This leads to an inefficient social risk allocation. To address this issue, Gordon and Sarada (2018) propose the imposition of a surtax on start-up profits and losses. They argue that this would result in a risk-neutral government assuming a greater proportion of risk than a risk-averse entrepreneur, thereby improving risk allocation. Furthermore, to prevent a decline in the number of new entrepreneurs due to an increase in the effective tax rate on profits, they propose to narrow the tax base and maintain the effective tax rate at the same level as before the surtax was imposed.

In the debt market, information asymmetries are addressed through the following measures. Entrepreneurs are assumed to borrow money as their own assets cannot cover their after-tax *start-up costs*. However, due to the information asymmetry between start-ups and outside investors, managers can only borrow to the extent of their own assets, leading to insufficient risk-taking. Gordon and Sarada (2018) propose a lenient treatment of tax losses incurred by start-ups to lower their after-tax *start-up costs.* A more lenient treatment of tax losses would incentivize start-ups that do not face financing constraints to assume excessive risk. To mitigate this side-effect, they suggest increasing the tax rate on profits, which may discourage new entrants as in the equity market. The authors argue for a more lenient tax treatment of investments. As a compromise between the above alternatives, they propose applying a normal tax rate symmetrically for profits and losses. This argument is noteworthy, as it may require a symmetrical treatment of profits and losses based on a logic different from the traditional one of ensuring neutrality on risk-taking. In other words, this logic provides a theoretical basis for the option of allowing symmetrical treatment of profits and loss-

[24] This managerial skill variable is different from the degree of innovation. This is an ability that can be demonstrated even with existing technology.

es only for start-ups, which are vulnerable to information asymmetry.

In response to a possible criticism that even non-entrepreneurial start-ups can incur losses through a selective realization of losses, Gordon and Sarada (2018, p. 9) suggest that restrictions be placed on the use of losses from financial transactions that are susceptible to strategic exploitation, or that the alleviation of tax loss utilization be targeted, as with Section 1244 of the IRC.[25] In addition, the authors clarify that their focus is not on discounting the innovative capabilities of existing established firms. Rather, their discussion is centered on start-ups, as they are more likely to face constraints on financing and may not utilize tax losses and R&D tax credits through income from other businesses unlike established firms (Gordon and Sarada, 2018, pp. 9-10).[26]

III-2. Transfer of Tax Attributes by Contracts

The non-refundability of tax losses and R&D tax credits creates a significant obstacle to achieving tax neutrality on risk-taking, and makes it challenging to create effective tax incentives to promote innovation. Tax refundability, however, has been met with resistance due to concerns about tax fraud under the existing tax system. An alternative solution is the transfer of tax attributes. However, there are restrictions under the current law for such transfers, as is typical in the situation of mergers and acquisitions (M&As).[27] Recently, tax receivable agreements (TRAs) have become increasingly popular in US IPOs. TRAs are contractual agreements that allow pre-IPO owners, such as founders, angel investors, and venture capitalists, to receive a significant portion (up to 85%) of the economic value of tax attributes from a corporation when the value is actually realized over time following the IPO.[28] In this article, the mechanism of TRAs and the arguments for and against them are discussed to broaden our understanding of the transfer of tax attributes.

III-2-1. What are Tax Receivable Agreements?

TRAs, which were first introduced in 1993, have gained significant attention as contractual provisions incorporated into an IPO tax structure known as “supercharged IPOs.” This structure became prevalent in the United States in the late 2000s. In a supercharged IPO, a pre-IPO firm attempts to increase its stock price by creating new tax attributes through selling its assets or interests to another corporation. The firm establishes a subsidiary, which it uses to step-up the tax basis of its appreciated assets or interests, or to turn its non-amortizable goodwill into amortizable. TRAs are inserted into a contract to share the economic value of tax benefits attributable to newly created tax attributes between pre- and post-IPO

[25] This provision allows losses of $1 million or less on small business stocks to be treated as ordinary rather than capital losses subject to the loss limitation rules.

[26] It is large companies that benefit from R&D tax incentives in the United States (Shay et al. 2016, pp. 448-49).

[27] Nagato (2017) presents a comprehensive summary of the theory of tax attribute transfer and examines the limitations imposed on such transfers in the United States and Japan. Bührle and Spengel (2020) provide a detailed classification of the anti-loss trafficking rules in various European countries. *See also* Mateotti (2023).

[28] The proportion of IPOs using TRAs was less than 1% before 2005, but rose to 8% in 2017 (Shobe, 2018, p. 891).

owners (Paul and Sabbah, 2013). In this Section, we focus solely on TRAs and not on the entire structure of a supercharged IPO, such as the Up-C structure, which is unique to US IPO practices[29] and has little direct relevance to Japan's IPO practices. It is worth noting that TRAs can be discussed separately from the Up-C structure and other techniques for creating new tax attributes (Polsky and Rosenzweig, 2018, pp. 452-53). In addition, IPOs that do not involve the creation of new tax attributes but use TRAs purely to transfer the value of existing tax attributes are becoming increasingly popular (Shobe, 2018, p. 892).

Shobe (2018, pp. 902-12) provides a comprehensive overview of the evolution of TRAs into three generations. The first-generation TRAs are designed to allocate the newly created tax attributes resulting from supercharged IPOs between the pre-IPO owners and the corporation or post-IPO owners in a manner that is both fair and reasonable. The second-generation TRAs, introduced in 2007, allocate not only the tax attributes generated by supercharged IPOs but also the value of pre-IPO tax attributes, such as the tax basis of assets and carryforwards of net operating losses. The third-generation TRAs, introduced in 2010, are used in non-supercharged IPOs to compensate pre-IPO owners by paying a portion of the value of existing tax attributes.[30]

As a background to the use of TRAs without the creation of new tax attributes, there has been a perception among pre-IPO owners that the value of tax attributes of a corporation going public is not adequately reflected in IPO pricing and that pre-IPO owners are not appropriately compensated for it. The IPO price is commonly calculated using EBITDA, which fails to consider the value of tax attributes.[31] If the value of tax attributes is fully reflected in IPO valuation, the use of TRAs would be redundant for pre-IPO owners. The justification for the use of TRAs is evaluated on the basis of the plausibility of this argument. Shobe (2018, p. 917) asserts that this justification was persuasive under the first generation of complex supercharged IPOs, but less so under the second and third generations, which address the value of existing tax attributes, and that investors do not fully understand the material information in a TRA even with perfect disclosure, as IPOs differ from private M&A deals where the parties engage in extensive negotiation.

In IPOs, the material information in a TRA is predetermined by a corporation and pre-IPO owners, with new shareholders deciding only whether to accept the offered price. Shobe (2018, p. 924) argues that, if it is justifiable to utilize a TRA when tax benefits are not adequately reflected, it is problematic that a TRA does not usually include an allocation of tax burdens, although the potential tax burden is not adequately reflected. However, there is a strong argument for using a TRA to reflect the value of tax attributes that are difficult to assess in advance when they are actually realized *ex-post*. Provided that these tax benefits are adequately disclosed to investors, it is not appropriate to view TRAs as problematic (Polsky

[29] *See* Paul and Sabbah (2013); Fleischer and Staudt (2014); Shobe (2017); Polsky and Rosenzweig (2018).

[30] The nature of the income paid under a TRA is considered as an additional purchase price payment for the acquired assets, a distribution to the existing shareholders for the net operating loss carryforwards, which is characterized as either a dividend, non-taxable recovery of basis to the extent of the historic equity owner's basis in the stock, or capital gains, depending on the acquisition price and amount of earnings and profits. *See* Paul and Sabbah (2013).

[31] *Id.* at 75.

and Rosenzweig, 2018, pp. 454-55).[32]

It is widely acknowledged that the evaluation of TRAs can be determined only through empirical analyses of investor rationality and the occurrence of double receipts.[33] It is commonly assumed that tax authorities do not challenge TRAs (Polsky and Rosenzweig, 2018, p. 453). This study emphasizes for the purpose of this article that the transfer of tax attributes through contractual agreements has become common in IPOs.

III-2-2. Relationship between TRAs and Tax Incentives for Innovation

TRAs have significant implications in the design of tax incentives for innovation. If the full value of tax attributes is not accounted for in IPO pricing, TRAs would allow start-up founders and venture capitalists to maintain the tax benefits of the incentives after the IPO as long as they can be carried forward, even if there is no refund. This will result in an alleviation of the success tax, and it is becoming increasingly important to provide founders and venture capitalists with an opportunity to recover the economic value of tax attributes resulting from their large initial investments for innovation after an IPO. For instance, Amazon and Tesla, in the past, and Uber and Lyft, in recent years, invested substantially and went public before they became continuously profitable enough to offset initial tax losses.

III-3. Capital Gains Tax Preference

As described in Section II-3, the basic building blocks of the existing tax system, including the progressive tax rate structure, the double taxation of corporate profits, and the realization-based capital gains taxation, may discourage entry into entrepreneurship and distort exit decisions. The preferential taxation of capital gains from the sale of start-up stocks can partially alleviate these distortions. Moreover, double taxation of corporate profits, where profits are taxed at both the corporate and shareholder levels while losses are only taxed at the corporate level, and shareholders can only deduct the original invested capital (Gentry, 2016, pp. 342-43), can be addressed through a capital gains tax preference for corporate stocks. This can be evaluated as a means to partially eliminate corporate double taxation (Viard, 2012, pp.740-41), and restore a symmetrical treatment of gains and losses (Gentry, 2016, p. 354).[34]

Section 1202 of the IRC provides a tax exemption for capital gains for founders and venture capitalists. This provision allows exclusion of gains on the sale of qualified small business stocks (QSBS), up to the greater of $10 million or 10 times the aggregate adjusted basis of stocks per issuer corporation, if the stocks are acquired directly from a C corpora-

[32] To the extent that a TRA is disclosed, double receipts will not occur, simply because rational investors would not accept the offerings and the underwriting price would be reduced. The use of a TRA was expected to increase in response to the uncertainty due to the COVID-19 tax measures and the possibility of a corporate tax increase under the Biden Administration (Foster, 2020). The inclusion of a TRA in contractual provisions is thought to be a reasonable measure to mitigate pricing uncertainty.

[33] Billings et al. (2023) have discovered that Up-C IPOs demonstrate noteworthy future operating performance but negative return performance, a phenomenon that may be attributed to the overvaluation at the time of their initial public offerings.

[34] Even if an entrepreneur exits through sales of corporate stocks when it does not yet make profits and pay corporate tax, the sales price of the stocks at the time of exit is expected to reflect the post-exit corporate tax burden. *See* Toder (2017).

tion through capital contributions or labor services, with a minimum holding period of five years.[35] This provision is anticipated to ease the restrictions on start-ups' access to financing and the lock-in effect on exit decisions.

However, there are criticisms against Section 1202. For example, the target is limited to only stocks of small business corporations (Viard, 2012). Moreover, the criteria for small businesses are based on total assets at the time of stock issuance, which is too generous for rich founders, venture capitalists, and employees of tech start-ups in Silicon Valley (Viswanathan, 2020; Polsky and Yale, 2023). In addition, Fleischer (2011, pp. 98-99) argues that the lock-in effect of capital gains taxation is not significant because capital gains taxation can be further deferred through the utilization of a tax-free reorganization[36] as the exit strategy rather than opting for an IPO.

Gentry (2016, pp. 337-41) refutes the conversion criticism by noting that it does not hold under the assumption that the labor income portion of sweat equity was paid as cash accompanied by an additional deduction at the corporate level, and that the entrepreneur would reinvest the after-tax wages in the corporation to maintain the original investment level. For example, when an additional 100 wages are paid for sweat equity, the entrepreneur is taxed an additional 100 times the wage income tax rate of t_w and obtains 100 $(1\text{-}t_w)$; however, at the corporate level, there is a reduction in corporate tax liability through an additional deduction of 100 times the corporate tax rate of t_b, and the funds that the corporation can put into business activities are reduced by 100 $(1\text{-}t_b)$. The entrepreneur then makes an additional investment of 100 $(1\text{-}t_b)$, which increases the entrepreneur's acquisition share price by 100 $(1\text{-}t_b)$, reduces the capital gain on the future sale of the corporation's shares, and decreases the capital gains taxes by 100 $(1\text{-}t_b)$ times the capital gains tax rate of t_c. Thus, if the present value of the increased tax burden of $100t_w$ is greater than the sum of the present values of the decreased tax burden of $100t_b$ and $100(1\text{-}t_b)t_c$ at the corporate and entrepreneurial levels taken as a whole, then the tax burden would be higher if labor income is converted into capital gains. For example, for the sake of simplicity, let us assume that all of this is done simultaneously and with the pre-2017 TCJA rules in mind: $t_w = 35\%$, $t_b = 35\%$, and $t_c = 15\%$; then, $35 < 35 + 9.75$. Even with the 2017 tax reform in mind, when $t_w = 32\%$, $t_b = 21\%$, and $t_c = 15\%$, $32 < 21 + 11.85$; thus, the conversion of labor income into capital gains is not always more favorable. Of course, this calculation assumes that there is sufficient taxable income to be sheltered by deduction at the corporate level; thus, in reality, there may be more room for cases in which it would be advantageous to convert. However, this is essentially a different issue of an asymmetric treatment of gains and losses.

[35] Section1202 was introduced in 1993 to exempt half of capital gains from taxation; it was then expanded in response to the financial crisis of 2009, and finally made permanent in 2015 to exempt the full amount of capital gains within the limitation. *See* Mort et al. (2019) ch. 15 §3. In addition, Section 1045 allows tax deferral when shares of a small business corporation are exchanged for those of another small business corporation.

[36] IRC §§ 368(a)(1)(B); 368(a) (2) (E) & 368 (a) (1) (A).

IV. Evaluation of Japan's Tax Policy for Innovation

IV-1. Positive Externality

IV-1-1. Tax Neutrality on Risk-taking

We evaluate Japan's tax policy on innovation. Before addressing the positive externality of innovation, it is important to assess whether tax neutrality on risk-taking and investment decisions is ensured under the Japanese tax law.

First, neutrality on risk-taking cannot be achieved since the individual income tax adopts a progressive tax rate structure.[37] It is generally not permissible to claim a refund for tax losses, either at the individual or the corporate level. Tax losses may be carried forward for only three years for individuals[38] and ten years for corporations.[39] Carryback of tax losses is allowed only for a year for individuals and SMEs with stated capital of 100 million yen or less.[40] In the Corporation Tax Act, as a general rule, the deduction of tax losses carried forward is limited to 50% of the net income for each business year, with the exception of SMEs.[41] In addition, considering rapidly growing start-ups, this limitation does not apply to young, unlisted corporations that have been in operation for seven or fewer years, regardless of the amount of stated capital. However, once corporations have become public, they are subject to this limitation.[42] Moreover, as an economic response to the COVID-19 crisis, the carryback of tax losses is extended to corporations with stated capital of 1 billion yen or less in each business year ending between February 1, 2020 and January 31, 2022.[43] In 2021, the 50% deduction limitation was temporarily eased for a maximum of five years in response to the COVID-19 crisis if "a business adaptation plan" under the Act on Strengthening Industrial Competitiveness (ASIC) was approved. These legislations, however, have no incentive effect on risk-taking conducted prior to the legislation, and only has the effect of providing cash flow in response to a sudden decrease in turnover.

It is evident that these rules structurally discourage start-ups, which have difficulty in earning stable profits in the early stages from taking risks since tax refundability is not available and the tax loss carryforward is only beneficial when taxable income exists.[44] Furthermore, the 10-year carryforward period is insufficient, especially for recent unicorns that may require more time even after their IPOs to generate stable profits.[45] There is no rationale to restrict the deductibility of tax losses upon an IPO. Other peer advanced countries, including the United States, the United Kingdom, Germany, France, Italy, and Spain, allow the carryforward of tax losses indefinitely.[46] The 10 years of limitation is due to the difficulty in

[37] Article 89 of the Income Tax Act (ITA).
[38] Article 70(1) of the ITA.
[39] Article 57(1) of the Corporation Tax Act (CTA).
[40] Article 140 of the ITA; Articles 80 and 144(13) of the CTA; Article 66(12) (i) of the Special Tax Measures Act (STMA).
[41] Article 57(11)(i) of the CTA.
[42] Article 57(11)(iii) of the CTA.
[43] Article 7 of the Act on Temporary Special Provisions for National Tax Related Laws to Respond to the Effects of New Coronavirus Infections.
[44] II-1-1(1).

tracking net operating loss carryforwards beyond 10 years, as the Companies Act only requires 10 years of bookkeeping,[47] while the burden of proof in tax litigation is borne by tax authorities (Fujita, 2015, p. 89). However, a legislative measure that enables a taxpayer to carry tax losses forward for more than 10 years, provided they maintain records of losses and bear the burden of proof in tax litigation, may be worth considering (Government Tax Commission, 2014, p. 5).

Regarding neutrality on investment decisions,[48] although investment in tangible assets is inevitably suppressed under income taxation, investment in intangible assets is encouraged for profitable firms beyond ensuring neutrality, even without tax refunds, because R&D expenses are immediately deductible[49] and there are no restrictions on interest deductions. With regard to tangible assets, SMEs are also entitled to various types of special depreciation and tax credits. For instance, SMEs are allowed to expense investments in small depreciable assets.[50] Furthermore, the SME Business Enhancement Tax Relief allows for expensing or a tax credit of 10% of the purchase price (7% for corporations with stated capital of over 30 million yen but less than 100 million yen) for certain equipment if an SME's business enhancement plan is approved under the SME Management Enhancement Act.[51] This policy aims to improve productivity and enhance SMEs' management capabilities. Moreover, the SME Investment Promotion Tax Relief provides a special depreciation of 30% or tax credit of 7% of the acquisition cost of certain machinery and equipment.[52] However, these tax measures are not available to start-ups without profits or corporate income tax (CIT) liabilities, as they are non-refundable and the carryover is limited to only one year. Furthermore, the policy objective does not specifically focus on promoting innovation in start-ups, but rather on providing preferential tax relief to SMEs with weak management capabilities (Sato, 2017, p. 53).

IV-1-2. Tax Incentives for Internalization of Positive Externalities

In Japan, R&D tax credits serve as a tax incentive to internalize the positive externalities of innovation. An incremental R&D tax credit was introduced in 1967; however, in 2003, it was combined with a volume-based tax credit as the growth of R&D expenditures stagnated. This decision was influenced by the need to address the deflationary economy and the choice to prioritize tax reductions for R&D and capital investment over a reduction in the general corporate tax rate (Government Tax Commission, 2002).[53] In 2014, the Government

[45] The Tokyo Stock Exchange (TSE)'s Growth market does not include profitability as a formal listing criterion, and some loss-making corporations have gone public. For instance, Mercari, which was a famous unicorn in Japan, was listed on TSE Mothers (the predecessor of the Growth market) in June 2018, has been in operation since 2013, yet has recorded losses in the three business years since its listing (<https://about.mercari.com/ir/library/pl/>). Combined with the annual deduction limitation, the losses carried forward from the early years of its establishment will expire.

[46] Matteotti (2023, p. 35) reports that 24 out of 39 surveyed countries allow for carryforward of tax losses indefinitely.

[47] Article 432(2) of the Companies Act.

[48] II-1-1(2).

[49] Article 22(3) (4) of the CTA.

[50] Articles 28-2 and 67-5 of the STMA.

[51] Articles 10-5-3 and 42-12-4 of the STMA.

[52] Articles 10-3 and 42-6 of the STMA.

Tax Commission (2014) recommended that R&D tax credit, the largest tax expenditure for businesses, should be significantly scaled back in response to the reduction in the corporate tax rate and that it should be converted to a system that provides incentives to increase R&D investment. On March 31, 2017, the incremental R&D tax regime was abolished and consolidated into a general volume-based regime; the nature of the incremental regime is now considered only in the determination of the tax credit rate under the volume-based regime. As of 2023, the amount of general R&D tax credits is between 1-14% of the R&D expenses, and the default ceiling is 25% of CIT liability before the application of the credit, but the exact ceiling varies between 20-30% depending on the ratio of the increase or decrease in R&D expenses.[54] Taxpayers can instead choose to use a fixed ceiling of 25% plus a high R&D intensity tax credit, with a ceiling of 10% of the CIT liability before the credit, if their R&D expenses account for more than 10% of their average annual turnover.[55] For SMEs, which are defined based on whether the stated capital is 100 million yen or less, the tax credit amount is more generous 12-17% of the R&D expenses, unless a firm falls under the definition of "non applicable business," whose average annual income in the latest three years is over 1.5 billion yen.[56] Refunds and carryforwards are not allowed in these R&D tax credits.

In 2017, the scope of eligible R&D expenses has expanded to include experimental research on the development of services utilizing information technology to promote the development of new services of the "Fourth Industrial Revolution" type utilizing IoT, Big Data, and AI (MOF, 2017, p. 389). However, it has been criticized that current tax incentives may not be effective in promoting innovation because the cost of improving *existing* products and technologies is also included within the scope of the incentive (Kohyama, 2018, pp. 10-11).[57]

Furthermore, the R&D tax credit provides special treatment for newly established start-ups. Under the general rules, a start-up that has passed its seventh business year or is listed on the stock exchange is subject to the aforementioned annual loss limitation rule[58] and will have to pay taxes even when it has accumulated losses. To address this situation, the ceiling of the R&D tax credit was lifted from 25% to 40% of the CIT liability before the credit for start-ups that have been in business for less than 10 years in 2019.[59] This amendment was intended to elevate the effective maximum amount of deductible losses by 20% for these start-ups when they invest in R&D (MOF, 2019, pp. 333-34). We acknowledge the efforts made to alleviate the limit on the deductibility of losses by linking it to R&D expenses; however, this approach deviates from maintaining neutrality on risk-taking and further com-

[53] *See also* Otake (2003); Imai (2002).
[54] Article 42-4(1)(2)(3) of the STMA.
[55] Article 42-4(2) of the STMA.
[56] Article 42-4(4)(5) of the STMA.
[57] While this criticism is valid, there is a possibility the R&D tax system itself can encompass policy goals that extend beyond the internalization of the positive externalities of innovation (*e.g.*, productivity improvement and promotion of firms' digital transformation). In this study, we focus on the aspect of the internalization of positive externalities, specifically.
[58] Article 57(11)(iii) of the CTA.
[59] Article 42-4(3)(i) of the STMA.

plicates the R&D credit system. A survey indicates that R&D credits have not been used by SMEs including start-ups because tax refunds and carryforwards are not available.[60] Japan's 1 minus B-index for loss-making firms is reportedly the second lowest among the 48 countries/regions surveyed by the OECD (2021a, pp. 13-14), indicating that there is room for improvement, especially considering that start-ups are more likely to incur losses.

Open innovation has recently attracted attention as a mechanism for innovation in Japan.[61] Open innovation involves collaborative R&D efforts among firms, public institutions, universities, and other private enterprises. Despite the recommendation by the Government Tax Commission in 2014 to shrink R&D tax credits, they were expanded in 2015 to include an open innovation R&D tax credit as a key component of Japan's growth strategy (MOF, 2015, p. 403).[62] As of 2023, under the open innovation R&D tax credit system, R&D tax credits (the ceiling is 10% of the CIT liability before applying tax credits) of 20%, 25%, or 30% of R&D expenses are allowed on "special experimental research expenses"[63] for joint research with public institutions, universities, start-ups, and other entities.[64] Regarding the scope of special experimental research expenses, expenses for joint research, even among private firms, were added in 2013. However, the expenses commissioned to private firms fell outside the scope, because it was difficult to distinguish them from those arising from the outsourcing of routine jobs. Finally, in 2019, research expenses commissioned by the private sector were added to the scope of special experimental research expenses with objective criteria (MOF, 2019, p. 338). Moreover, the tax credit ratio for special experimental research expenses for innovative joint research and commissioned research with the private sector increased from 20% to 25%, and the ceiling also increased from 5% to 10% of the CIT liability before the credit (MOF, 2019, pp. 351-52).

In 2020, the open innovation promotion tax measure was introduced. A corporation that makes a mid-term investment in a "new business pioneer" start-up under the ASIC to collaborate is allowed to claim a special deduction for the invested amount to assume the start-up's stocks. If a corporation acquires stocks of start-ups through investment, 25% of the acquisition price is immediately deductible if the stocks are held until the end of the acquisition business year.[65] The MOF (2020, pp. 434-35) explains that this tax preference is an "extremely unusual" treatment to encourage Japanese corporations to engage in open innovation with start-ups. This deduction was extended until March 31, 2024, and expanded to include the purchase of stocks from a third party in M&As in 2023.

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[60] According to a survey on the usage of the R&D tax credits by SMEs, a large percentage of the respondents (20-30%) did not use the R&D tax credits due to losses, as well as because they were not aware of the existence of the tax credits (Mitsubishi UFJ Research & Consulting, 2020, pp. 18-28).

[61] The idea of open innovation was presented in the METI's request for the 2009 tax reform, and its expansion was expected in the future (Yanase, 2008, p.19).

[62] Revised Strategy for the Revitalization of Japan 2014 (Cabinet Decision, June 24, 2014).

[63] Article 42-4(19)(x) of the STMA.

[64] Article 42-4(7) of the STMA. To prevent duplicate application, the amount of special experimental research expenses, which is the basis of calculation for the application of the above-mentioned total R&D tax credits, is excluded from the amount of eligible special experimental research expenses.

[65] Article 66-13(1) of the STMA.

IV-1-3. Evaluation

In Japan, tax refundability is not available and the carryforward period, if it is allowed, is short in all of these tax measures. Japan's R&D tax incentives constitute 83% of the total government support for R&D (OECD, 2021a, p. 35).[66] The primary beneficiaries are profitable companies, the majority of which are large corporations (OECD, 2021b). The OECD (2021a) emphasizes the significance of refundability, particularly for young innovative firms, noting that some countries including Australia, Canada, and France, allow refunds or equivalent incentives for SMEs, while other countries including Austria, Belgium, Denmark, Germany, Iceland, Ireland (after five years), New Zealand, Norway, Spain, and the United Kingdom allow refunds regardless of company size. Furthermore, the OECD (2021a, p. 20) highlights the importance of allowing tax credits from payroll taxes and social security contributions for loss-making companies even without refundability.

If tax refunds and carryforwards are unavailable, the transfer of tax attributes is sought. However, in Japan, there are restrictions on the transfer of tax attributes across corporations with the exception of group relief tax rules. The transfer of tax losses through the acquisition of stocks is restricted,[67] and even if the requirements for a qualified merger to transfer losses are met, there is a risk of disallowance by tax authorities through the application of targeted anti-avoidance rules (TAARs).[68] In the corporate bankruptcy phase, expired net operating losses can be used and the transfer of net operating loss is allowed; however, expired net operating losses can only be used to offset the cancellation of debt income, recognized gains on assets, and gifts from executives and related persons, which are not relevant for start-ups, for which equity finance is the mainstream.

In conclusion, Japan's tax system for promoting innovation is not effective for start-ups that are expected to drive innovation. Instead, the system primarily benefits established corporations with stable revenue streams.[69] Japan's complicated system requires specialized knowledge and the cost of utilizing it is high,[70] making it challenging for start-ups with limited resources to use it.[71] Improvements are necessary for start-ups that may incur losses in their pursuit of innovation. The discussion of whether non-refundability can be contractually addressed by TRAs will be addressed later.[72]

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[66] Japan's total government support to business R&D as a percentage of GDP is below the OECD average, with a value equivalent to 0.1% of GDP (OECD, 2021b).

[67] Article 57-2 of the CTA.

[68] *E.g.,* Article 132-2 of the CTA. Supreme Court, 29 February 2016, Minshu, Vol. 70 No. 2, p. 242 [Yahoo Japan]; Supreme Court, 29 February 2016, Minshu, Vol. 70 No. 2, p. 470 [IDCF]. In these cases, the attempt by SoftBank Group Corporation to transfer and utilize expiring business losses of a related corporation through a series of corporate reorganizations was disallowed by the application of a TAAR.

In the TPR case, the transfer of tax losses of a 100% subsidiary through a qualified merger was disallowed on the grounds that the business of the merged subsidiary was not continued at the parent corporation level but in another newly established subsidiary. Tokyo High Court, 11 December 2019, Shoumu Geppou Vol. 66 No. 5, p. 593 [TPR].

[69] OECD (2021a, pp. 25-26) indicates the proportion of R&D tax support claimed by SMEs in Japan accounts for 7%, which is the second lowest among the 48 countries surveyed.

[70] It was reported that the third most common reason (15-20%) for SMEs not using the R&D tax credit was due to the perceived time-consuming process involved (Mitsubishi UFJ Research & Consulting, 2020, pp. 18-28).

[71] II-2-3. According to a recent survey, more than 60% of respondents have answered that they have never utilized either the SMEs Investment Promotion Tax Relief or the SMEs Business Enhancement Tax Relief (Tokyo Shoukou Research, 2022).

IV-2. Constraints on Financing for Start-ups

IV-2-1. Overview of the Angel Tax System

Japan has a tax incentive known as the "angel tax system," which aims to ease restrictions on funding for start-ups.[73] Under the current system, individual investors who invest in start-ups can use two preferential allowances. The first option, preferential measure A, allows taxpayers to deduct from their gross income the portion of the investment in the start-up exceeding two thousand yen, provided that the start-up has been in business for less than five years and meets other requirements. The limit is either 40% of the gross income or 8 million yen, whichever is lower.[74] The second option, preferential measure B, allows taxpayers to deduct the full amount of their investment in the start-up from their capital gains on the alienation of stocks in the same year, provided that the start-up has been in business for less than ten years and meets other requirements.[75] These measures have an effect similar to accelerated depreciation for investors, in that they accelerate the deduction of the acquisition cost of stocks.

In addition, a new generous special tax preference for pre-seed/seed investments was introduced in 2023. This preference allows individual investors to deduct the amount invested in start-ups that are in the pre-seed/seed stage from the capital gains derived from the alienation of stocks, up to a maximum of 2 billion yen.[76] This policy aims to encourage greater investment in start-ups by ex-founders, angel investors, and other individuals, with the ultimate goal of strengthening Japan's start-up ecosystem under the "new form of capitalism" policy by the Kishida cabinet.[77]

Furthermore, individual investors who experience losses due to the decreased value of their stocks in start-ups before the IPO are considered to have incurred losses on the alienation of stocks. The amount of deduction made using either preferential measure A or B at the time of investment is subtracted from the acquisition price. These losses are then offset by capital gains from the alienation of stocks in the same year. Any remaining capital losses can be carried forward for three years.[78] This can be seen as an exceptional measure designed to partially restore the symmetrical treatment of gains and losses with respect to investments in start-ups, which are subject to the general rules of strict limitation on the deduction of losses invested in stocks by individuals.[79]

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[72] IV-3-1.

[73] The "specified SMEs" (Article 37-13 of the STMA) and "specified new SMEs" (Article 41-19 of the STMA) subject to the angel tax system are stock companies that fall under the category of "specified new SMEs" as defined in the Law for Strengthening Management of SMEs and other stock companies listed in the respective provisions. The prefectural government must confirm that the company has fulfilled the requirements specified by the Ordinance of the METI. However, for those that are considered to have received professional advice from venture capitalists or crowd-funders approved by the METI, the above requirements are exempted and confirmation by the prefecture is not required (MOF, 2020, pp. 210-17).

[74] Article 41-19 of the SMTA.

[75] Article 37-13 of the SMTA.

[76] Article 37-13-2 of the STMA.

[77] New Form of Capitalism Realization Conference, Start-up Development Five-year Plan (Nov. 28. 2022); MOF (2023, p. 136).

[78] Article 37-13-3 of the STMA.

IV-2-2. History of the Angel Tax System

To appraise the current angel tax system, it is imperative to consider its historical development, along with the transformation of general tax rules for gains and losses from the alienation of stocks. Our examination reveals that the focus of preferential tax treatment shifted from the *ex-post* termination/exit stage to the *ex-ante* investment stage.

Regarding the termination stage, in April 1989, the taxation of gains and losses from the alienation of stocks, which had long been untaxed since 1953, commenced. Under the tax system, taxpayers were presented with two options for taxation: 26% national and local taxation (separate self-assessment tax system) or 20% national taxation (separate withholding tax system at source) with a 5% deemed gross sales price as net gains on the sale. Most investors opted for the latter, which restricted the capacity for the deduction of losses on stock investments, particularly for individuals who invested in start-ups.

The Ministry of International Trade and Industry (MITI, predecessor of the METI) requested that a 20% tax credit be allowed for stock investments in start-ups that had been in business for five years or less to maintain the separate taxation of capital gains on stocks and avoid a shift to comprehensive progressive taxation (Mochizuki, 1996, p. 23).[80,81] In response, investment losses in start-up stocks prior to their listing were made deductible in 1997. The tax system deemed losses on unlisted stocks invested in start-ups established within five years as capital losses arising from the alienation of stocks, which were to be offset against other gains from the alienation of stocks and carried forward for three years.[82] This system was intended to increase individual investors' investment to supply their funds to start-ups (MOF, 1997, pp. 74-75). In 2013, despite the abolishment of the general rule permitting the offset of losses in unlisted stocks against capital gains in listed stocks, individual investors were still allowed to do so under the angel tax system. This was a departure from the tax reform that introduced a separate tax system for stocks, which effectively disallowed the offset of such losses.[83]

Next, in the exit stage, even under the general tax exemption system for gains and losses from the alienation of stocks, founders' profits arising from the alienation of stocks were exceptionally taxed progressively through comprehensive taxation because of the introduction of taxation on the alienation of stocks that resembles alienation of a business in 1961 (Shiozaki, 1961, p. 155), and the addition of alienation of stocks in an IPO phase to that category in 1971 (Sakamoto, 1971, pp. 12-13). Notwithstanding that gains and losses arising

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[79] In Japan, losses arising from worthless stocks are not deductible in the general individual income tax rules. *See also* Tokyo High Court, 27 December 2006, Shoumu Geppou Vol. 54 No. 3, p. 760; Tokyo High Court, 14 October 2015, Zeimu Soshou Shiryou, No. 265-12739 (a shareholder investing in a bankrupt corporation cannot recognize capital losses on the alienation of their stocks).

[80] After the abolition of the elective withholding tax system, the MITI began to request that losses on stocks be allowed to be offset against other income in the angel tax system (Sato, 1999, pp. 45-46).

[81] Yoshimura (2007) provides a study of restrictions on the use of losses in a separate tax system under the trend toward an integrated taxation of financial income.

[82] In 2000, the scope was expanded to include corporations established within 10 years or less.

[83] The offset was allowed because angel investors were considered to own listed stocks and it was considered necessary to maintain the same incentive measures for start-ups as before (MOF, 2013, pp. 138-39).

from the alienation of stocks became generally taxable in April 1989, founders' profits in IPOs from the alienation of their corporation's stocks, which had been owned for more than three years at the time of listing, could not be subjected to separate withholding taxation. Instead, only half of the founders' profits were taxable at a rate of 26 percent, which is referred to as the "special exception for founders' profits" (Ishi, 1993, pp. 168-69). An additional tax preference was introduced in 2000. The tax preference further halved the taxable gains from the alienation of stocks of specified SMEs, which were established within five or ten years depending on the category if the alienation took place within a year of the IPO (extended to three years or less in 2003). This is known as the "special exception for taxation on gains from the alienation of specified SME stocks" (MOF, 2000, p. 49).

However, these tax measures were not used well, possibly because they could only be used at the termination or exit stage. In 2003, preferential measure B was introduced as a tax incentive at the *ex-ante* investment stage (MOF, 2003, p. 185).[84] The preferential tax rate of 10% was introduced for the alienation of listed stocks in 2003, which led to the suspension and subsequent abolition of the special exception for founders' profits in 2005 (MOF, 2005, p. 91). In 2008, preferential measure A was introduced, partly in response to a request for a revision to make it available to individual investors without gains from the alienation of stocks (Yanase, 2007, p. 21); in return, "the special exception for taxation on gains from the alienation of specified SME stocks" was abolished (MOF, 2008, p. 231).

In 2020, the open innovation promotion tax measure was introduced for corporations' venture investments. Moreover, the special exclusion of capital gains through reinvestment in start-ups was introduced in 2023. These measures are expected to significantly relax restrictions on start-ups' financing.

IV-2-3. Evaluation

The transformation of Japan's angel tax system from tax incentives at the termination or exit stage of investment to tax incentives at the investment stage can be viewed through the analytical framework of Hemel and Ouellette (2013) as a shift from an *ex-post* system to an *ex-ante* system. In Japan, where the inflow of funds to venture investments has historically been much smaller than that in the United States,[85] this change can be considered reasonable in addressing the constraints on start-ups' access to financing, considering that most venture investments fail.

It has been observed that the familiarity with the angel tax system and its use remains stagnant. A survey was conducted by Mizuho Information & Research Institute (2019) among unlisted SME venture firms that have been in operation for less than 10 years and have shown sales growth of 15% or more for two consecutive business years. The results revealed that only 23.3% of the respondents were aware of the angel tax system, and of those, 44.7% claimed to have learned about it after completing their start-up financing. The rea-

[84] The METI continued to request a 20% tax credit at the investment stage (Imai, 2002, p 42).
[85] Venture White Paper (2022, p. I-128) shows the VC investments in Japan are less than 1% of that in the United States.

sons cited for not utilizing the angel tax system include uncertainty about eligibility, lack of a specialist to consult, and a complex application process. The current angel tax system is overly complicated with multiple parallel measures, requiring approval from a prefectural governor.[86] This system is not suitable for start-ups with limited financial and time resources.[87]

Moreover, the scope of the angel tax system and open innovation promotion tax measures does not extend to fundraising by subscribing to stock options (METI, 2020). It is possible to modify the scope in response to evolving fundraising methods of start-ups.

IV-3. Impact on the Entry and Exit Decisions

IV-3-1. Impact on the Entry Decisions

Given the extremely low probability of success for start-ups, it is unrealistic to expect significant results from tax incentives in the exit stage including the special exceptions for founders' profits and taxation on gains from the alienation of specified SME stocks.[88] It is explained that newly introduced tax exemptions for capital gains from the alienation of stocks if the proceeds are reinvested in start-ups is the tax preference in the entry stage to encourage investments in start-ups (MOF, 2023, p. 136). However, it may be more accurately characterized as a tax preference for successful founders and venture capitalists in the exit stage, as modeled after the QSBS tax preference in the United States.

For a sole entrepreneur, the progressive income tax rate structure in individual income taxes leads inevitably to a success tax. However, most start-ups in Japan take corporate form because of the absence of pass-through tax rules (Masui, 2000). Even if pass-through tax rules were to be legislated, it is possible that they would not be user friendly for start-ups, as was the case in the United States.[89] It is of utmost importance to ensure that tax attributes, including the corporate-level losses, are available for future utilization by entrepreneurs and investors not to discourage potential entrepreneurs from entering the market. This is particularly relevant in Japan, where tax losses can only be carried forward for 10 years and start-ups are subject to the annual limit on the utilization of tax losses once they go public. It is important that the value of tax attributes be fully reflected in IPO pricing, as failure to do so may discourage entrepreneurs from taking risks. To address this issue, TRAs can be employed to enable pre-IPO owners to enjoy the value of tax attributes even if they are not profitable when they exit. The use of TRAs in IPOs may result in payments classified as dividends, capital recovery, or consideration for the alienation of stocks.[90] It is crucial that such payments under TRAs not be challenged by tax authorities.

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[86] *See supra* note 73.
[87] II-2-3.
[88] IV-2-2.
[89] II-3-1.
[90] *See supra* note 30 and accompanying text.

IV-3-2. Impact on the Exit Decisions

(1) Conversion of Labor Income into Capital Gains

Capital gains taxation on the alienation of stocks has a lock-in effect on exit decisions. Since 2014, capital gains from the alienation of stocks are taxed separately at a flat rate of 20% regardless of exit strategies of M&As or IPOs.[91] Thus, compared to the progressive tax rate structure of the individual income tax, the conversion of labor income into capital gains of stocks can reduce the tax burden for high-income individuals.[92] While preferential treatment may ease the double taxation of corporate profits and the restrictions on tax loss utilization, the benefits of the conversion in Japan, whose maximum combined national and local individual income tax rate reaches 55%, are greater than those in the United States. When we consider the introduction of a provision similar to Section 83(b) of the IRC, we need to factor in the problem that Section 83(b) allows for greater manipulation in the timing of taxation of stock compensation and conversion of labor income into capital gains in the United States. Any such provision should be introduced only when accurate valuation of stocks is institutionalized.

In the United States, a common route for start-up founders to exit their corporations is through acquisition by a publicly listed corporation, either in the form of a stock-for-stock exchange or a reverse-triangular merger.[93] This approach allows for tax deferral, and it is common for founders to hold onto received stocks until their death to avoid paying taxes on unrealized capital gains. In Japan, interest among entrepreneurs of fast-growing start-ups in tax-free stock-consideration M&As as a way to exit their corporations is increasing (Ando et al., 2018). Tax deferral for stock-for-stock acquisitions, known as "share delivery" under the Companies Act,[94] was introduced in 2021 to address the lock-in effect often associated with stock-consideration M&A deals. Nagato (2020) examines the rationales for using stocks as a method of payment in M&As to argue that the use of stocks can be justified from an efficiency standpoint in cases where i) the acquiring corporation has ample investment opportunities but lacks cash, or ii) the acquiring corporation wishes to share investment risk with the shareholders of the target corporation. However, if the acquiring corporation is not cash constrained, but chooses to utilize its stocks as a means of payment due to an overvaluation of its stocks in the market, it would be inappropriate to grant tax deferral. In Japan, a share delivery has been employed by several start-ups as an exit strategy, many of which can be classified as i) or ii) above (Nagato, 2023b, pp. 157-58).

However, it is also important to consider the distributive aspects of the benefits of tax deferral associated with converting illiquid unlisted stocks into liquid listed stocks through M&As, even though tax deferrals are already available for pre-IPO owners in IPOs if they keep holding the stocks of the corporation. The option of tax deferral in M&As is highly ap-

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[91] Articles 37-10 and 37-11 of the STMA. However, Sato (2013, p. 40) finds it difficult to explain why the remaining portion of income not categorized as "financial income" under the integrated taxation of financial income should still be subject to separate taxation.

[92] II-3-2.

[93] *See supra* note 36 and accompanying text.

[94] Article 66-2-2 of the STMA.

pealing for founders and venture capitalists to defer the taxation of capital gains because they can defer the taxation of unrealized capital gains at their death, although a basis step-up is not allowed in Japan.

(2) Neutrality between M&A and IPO

Since 2014, the alienation of stocks in M&As and IPOs have generally been treated equally for tax purposes, although not completely. It is imperative to understand the historical context in which neutrality was achieved, as it was recently achieved, and its significance cannot be overstated.

In 1953, gains and losses from the alienation of stocks were exempted from taxation. However, in 1961, the alienation of stocks that resembles the alienation of a business became taxable; in 1971, the alienation of stocks through an IPO was added to that category.[95] As a result, the 1971 amendment made the treatment of M&As and IPOs neutral to the extent that they qualified as that category. However, in April 1989, the alienation of unlisted stocks via M&As became subject to 26% taxation, while IPOs could halve the amount of taxable capital gains by the special exception for founders' profits. IPOs have become more advantageous due to the establishment of the additional tax preference of the special exception for taxation on gains from the alienation of specified SME stocks in 2000. Consequently, only one-fourth of the capital gains realized in IPOs are taxable. In 2003, a temporary preferential tax rate of 10% was introduced for the alienation of listed stocks, which helped maintain the advantage of IPOs even after the suspension of the special exception for founders' profits. In 2004, the neutrality between exits through M&As and IPOs drew attention, leading to the addition of the alienation of certain unlisted stocks into the scope of special exception for taxation on gains from the alienation of specified SME stocks (MOF, 2004, pp. 7, 116). Although the tax rate for the alienation of unlisted stocks was reduced to 20%, the temporary preferential tax rate of 10% was still applicable to the alienation of listed stocks. The special exception for taxation on gains from the alienation of specified SME stocks was abolished in 2008 because of a change in policy toward preferential tax treatment in the investment stage rather than in the exit stage. The temporary preferential tax rate on the alienation of listed stocks was terminated at the end of 2013, resulting in a current neutral tax rate of 20% between IPOs and M&As. Although the proportion of IPOs employed as an exit strategy by start-ups in Japan is higher than in Europe and the United States,[96] maintaining neutrality between M&As and IPOs is crucial to promoting open innovation (Shishido et al., 2019, pp. 53-54).

(3) A Trade-off between Progressive Taxation and Efficiency

Even if M&As and IPOs are treated neutrally, the problem of the conversion of labor income into capital gains arises as long as it takes the form of stock alienation. In addition, a

[95] IV-2-2.
[96] Venture White Paper (2022) at I-23-24, 141, 154-55.

huge exemption was introduced in 2023 for successful founders and venture capitalists, notwithstanding the harsh criticism of this type of tax preference in the United States (Polsky and Yale, 2023).

One way to solve this problem is to introduce comprehensive progressive taxation regardless of the character of income.[97] However, such a treatment would reinforce the character of the existing tax system as a success tax on entrepreneurship, due to the limitations on the deductibility of losses, the double taxation of corporate profits, and the progressive tax rate structure. From an efficiency perspective, comprehensive progressive income taxation is undesirable. In addition, it will weaken Japan's international competitiveness for talents. It is particularly important to be aware of the need to adjust the corporate tax burden at the individual level when we consider the comprehensive progressive taxation of capital gains from the alienation of stocks.[98] As large US multinational enterprises (MNEs) are taxed at very low effective rates at the corporate level,[99] heavier taxation of capital gains is likely to garner support. Conversely, Japanese large corporations are thought to be paying relatively high corporate taxes and, therefore, the same conclusion may not immediately apply. Furthermore, start-ups may be priced high, even though they have not yet generated stable profits at the corporate level. This makes it even more challenging to develop an *ex-post* adjustment mechanism once they become profitable. Therefore, it is certain that the conversion of labor income into capital gains is problematic, but we should deal with this issue with caution.

V. Conclusion

In this study, we evaluate Japan's tax policy for innovation. The use of a tax system to promote innovation can be justified as a measure to address the positive externality of innovation, the restrictions on start-ups' financing, and the distortions caused by the basic structure of the existing tax system.

Having evaluated Japan's tax system with these considerations in mind, we observed that the restrictions on the utilization of tax losses to ensure risk-neutrality were extremely severe, and that R&D tax credits designed to internalize positive externalities were not fully utilized by start-ups due to the absence of refunds or carryforwards. In light of these findings, we recommend that the government be more receptive to the transfer of tax attributes

[97] Ideally, only the portion of capital gains from the alienation of stocks that is converted from labor income should be subject to comprehensive taxation.

[98] Kleinbard (2017, pp. 288-98) presents a dual business enterprise income taxation (dual-BEIT) system that incorporates a progressive tax on labor income, a flat rate of 25% on capital income, a tax on deemed excess profits at the entity level set at 25%, and a tax on deemed normal return at the investor level set at 25%. The taxation of deemed conversion of labor income into capital income by management-controlled shareholders is subject to the labor income tax rate for the portion deemed to have been converted, with the option for individual-level adjustment to the tax burden at the entity level.

[99] According to Toder (2020, pp. 1226-27), an estimate is presented regarding the scenario of a lower effective corporate tax rate (7.5%). This scenario assumes that a company, after starting a business, evolves into an MNE and transfers profits to tax havens. However, the introduction of GILTI and reduction in the CIT rate under the TCJA may reduce the incentive for profit shifting.

through contracts with extended carryover periods. Moreover, while the angel tax system, which was intended to alleviate restrictions on financing, has been appropriately transformed from preferential treatment at the exit stage to one at the investment stage, its present complexity, resulting from multiple revisions, may impede the use of this system by start-ups with limited financial and time resources.

Apart from market failures, the existing tax system, including the progressive tax rate structure, the double taxation of corporate profits, and the realization-based capital gains taxation, adversely impacts entrepreneurs' entry and exit strategies. To address the entry disincentive effect of the success tax on entrepreneurs, we propose making tax attributes such as losses available to entrepreneurs even after their exit through contracts and treating M&As and IPOs neutrally as exit strategies. In addition, we suggest that tax policy decisions should consider the fact that an exit through the alienation of stocks enables the conversion of labor income into capital gains on stocks, which is inherently inconsistent with the ideals of the progressive labor income taxation.

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