

Adjustment of allocation plans for stock-based compensation costs*

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Abstract

Prior research has considered accounting for stock options based on the idea that stock options require recognition of the costs associated with the consumption of labor services. This study uses normative and descriptive research to consider the logical necessity of accounting in the revision phase of plans for the allocation of stock-based compensation costs. Because revision of numbers to actual amounts is also performed in other fields of accounting, the number of stock options granted will be adjusted even when there are no specific modifications. We also discuss the modification of allocation plans (without specifying whether the corresponding account of the cost is a liability or equity), using allocation procedures in other fields of accounting. We found that in revising allocation plans for stock-based compensation, a revision procedure (accounting for adjusting the numbers of stock options granted) similar to that of the current standards can be considered as the widely accepted theory. Remeasuring at fair value of stock options at each reporting date is not a nontrivial solution for revision procedure (accounting for modification). Also, the procedure for modifying the allocation plan for stock-based compensation (accounting for adjusting the number and modification), regardless of whether the corresponding account of costs is a liability or equity, can be a powerful theory.

Keywords: stock options; allocation plans; stock-based compensation costs; the numbers of stock options granted; modification

(1) Introduction

This study uses normative and descriptive research to consider the logical necessity of accounting in the revision of plans for the

allocation of stock-based compensation costs (accounting for adjusting the number of stock options and modification). All major global accounting standards, including the Japanese

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generally accepted accounting practices (JGAAP) set by the Accounting Standards Board of Japan (ASBJ), call for the provision of useful information for decision making by stakeholders (subsequent facts that can alter investment expectations) as the purpose of financial reporting (ASBJ, 2006, Section 1 paras. 1-3; ASBJ 2005a, paras.1-3). Thus, in accordance with the matching principle, the principle of cost allocation is used to calculate the profit for a period.

For stock options, prior international research has generally considered their accounting treatment based on the idea that cost recognition for labor service consumption is required (Mohri, 2013). Additionally, major accounting standards authorities, such as the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB), have stipulated that recognition of stock-based compensation costs is an objective of these standards. Accordingly, recognition (cost allocation) of stock-based compensation costs can be understood as a central issue in the discussion of accounting for stock options.

However, regarding this cost allocation, there is a need for revisions to be made as predictions and estimates are revised, as with extraordinary depreciation of tangible fixed assets (ASBJ 2005a, 36 ; FASB ASC, para. 250-10-45-20). In the case of stock-based compensation, the allocation plan may need to be revised to reflect changes in the number of allocated stocks due to reasons such as mid-term retirement and modifications of the

conditions. Modification of conditions refers to “a change in the terms or conditions of a share-based payment award.” (FASB ASC, para. 718-20-20). This paper utilizes normative and descriptive research to examine the revision of allocation plans for stock-compensation costs, which has not been always considered in prior studies¹. Therefore, this study examines the following points:

- What is the basic idea behind the revision of number of stock options granted to the actual numbers common to the current standards?
- Is it self-evident that each year these estimates are updated to reflect the passage of time and the changes in estimates in accounting for modifications to the terms and conditions on which stock appreciation rights were granted? (Is it self-evident that at the point the corresponding account of a cost becomes a financial liability, the procedure for adjusting the allocation plan becomes remeasuring at fair value of stock options at each reporting date?)
- When adjusting plans for stock-based compensation costs, is it preferable to use remeasuring at fair value of stock options at each reporting date for exchange of old stock options for new stock options (liquidation of investment and reinvestment) according to FASB ASC Topic 718-30, or to adjusting allocation plans

¹ Empirical and analytical studies have been conducted on the revision of allocation plans for stock-based compensation costs. In particular, in empirical studies by Brenner et al. (2000) and Acharya et al. (2000), examined

the modification of conditions for the per unit fair value (particularly, downward revision of the per unit fair value). For further details, refer to Section 4.5.2.

according to ASBJ (2005b b; 2005c) and the IASB (2016) (continuance of investment)?

(2) Reviewing the current standard for stock-based compensation – Where the issues lie

1. Processes related to the adjustment of general allocation plans

1.1. Cost allocation procedures

The shared objective of financial reporting in major standards is to provide useful information for stakeholder decision-making (i.e., that expectations placed on an investment have shifted after the fact) (ASBJ 2005a, paras. 1-3; ASBJ, 2006, Chapter 1, paras. 1-3). Accordingly, the period profit calculation examines whether inputs of goods and services lead to the expected production of goods and services by comparing costs and revenues in each period (Nakajima 1979, p. 119; Paton and Littleton, 1940, p.15). This is the matching principle. This principle is characterized as a principle for the calculation of cost because it determines costs for a period of time based on their correspondence with revenue (which is an independent variable assumed to be exchanged with a third party independent of the company) (Morita, 1969, p. 40; Ueno, 1985, p. 139).

This case uses the cost allocation principle. When calculating profits for a period of time, to show gradual consumption through a firm's production activities, not all costs (cash flow or CF values) are recognized as costs immediately at the time of input of goods and services; in fact, current expenditures are recognized as costs while unrealized expenditures are deferred as

assets (Paton and Littleton, 1940, p.25; Ueno, 1985, pp. 135-136).

1.2. Processes relating to the adjustment of cost allocation plans

While the cost allocation approach applies regular allocation under the current standard for stock options (e.g., the straight-line method is applied to depreciable assets), there are in general ² three techniques for revision of forecasts and estimates: (a) the retrospective approach, (b) the prospective approach, and (c) the catch-up approach (FASB 2000, paras. 89-100. In (a), costs are adjusted retrospectively, leading to revision to costs made in all previous periods. In (b), all revisions to costs are made in the current period and thus, are recorded immediately and in full. In (c), the revised value is allocated across the remaining allocation period (FASB 2000, paras. 89-100).

2. Current standards for stock-based compensation

2.1. Provisions for adjusting stock-option allocation plans

The treatment of the above estimates during revision of stock options is largely the same under the ASBJ (2005b; 2005c) and the IASB (2016). Specifically, first, as in other fields of accounting, any deviation in the number of stock options granted from the actual number is required to be corrected to the actual value, and so total cost is revised in accordance with changes in quantity ex post (ASBJ 2005b, para. 7 (2) and 51-53 ; ASBJ 2005c, p. 3 ; IASB 2016, paras. IN5 (c) and 19-20). Second, excluding their forfeiture due to non-satisfying of the vesting conditions, regardless of any change in

² For this framework, I refer to the discussion on adjustment of allocation plans by present value

calculation in FASB (2000, paras. 89-100), following Kawamura (2001, 143-148).

the modification and cancellation or liquidation of stock options, at a minimum, labor services (and their costs) must be recognized and measured at the fair value of the stock option as of the grant date (ASBJ 2005b, paras. 55-56 ; ASBJ 2005c, pp. 4-5 ; IASB 2016, paras. IN5 (e) and BC237³). Then, except in cases where the unit price has depreciated, the catch-up approach shall be used (ASBJ 2005b, paras. 10-12 and 55-57 ; ASBJ 2005c, pp. 4-5 ; IASB 2016, paras. IN5 (e) and BC 237). However, while similar to these provisions, the FASB ASC (para. 718-20-35-6) considers the fundamental idea to be the exchange of new stock options for old (original) stock options.

2.2. Provisions for adjusting allocation plans involving SARs

SARs share a commonality with stock options, as first, the total cost of SARs is revised according to ex post changes (actual value) in the number of SARs (IASB 2016, para. 33 ; FASB ASC, para.7 18-30-35-1 through 3). However, there is no provision for modifications to the conditions in which stock options were granted under IASB (2016). This is because for SARs, remeasuring at fair value of stock options at each reporting date was originally reflected in the value of the stock-based compensation cost, and hence, it is understood that no special guidance is required when modifying conditions. This too is described in FASB ASC (para. 718-30-35-5).

3. The locus of the issue

This section summarizes general cost allocation plans and the approaches of their

revision and confirms the adjustment of allocation plans for stock-based compensation costs under the current standards.

Table 1 International comparison of accounting treatment for modification of conditions

	Stock Options	Stock Appreciation Rights
FASB ASC	(c) Stock options and stock appreciation rights, new and existing, are both processed as exchanges of stock-based compensation. However, the standard finds that no special stipulations are needed for (b) stock appreciation rights, since they are remeasured at their fair value at each reporting date, the same as in IFRS.	
IFRS	(a) Processed by the catch-up method, except where the per unit fair value has decreased.	(b) N/A ¹ (Remeasured at fair value at each reporting date)
JGAAP		N/A ²

1. In IASB (2016), no treatment is stipulated for the case where conditions are modified considering stock appreciation rights.

2. In Japanese accounting standards, there is no stipulation whatsoever about stock appreciation rights.

Within this, revisions to the numbers of stock options (except for modification) granted are required to be revised to actual values for both stock options and SARs with any current standards (ASBJ 2005b, paras. 7 (2) and 51-53 ; ASBJ 2005c, p. 3 ; IASB 2016, paras. IN5 (c), 19-20, and 33). However, when conditions are modified, (a) under ASBJ (2005b, paras.55-56)

³A change in the conditions of stock options is "an ex-post change in the conditions of allocated stock options, with the intention of changing the fair unit price of the stock

option, the number of stock options, or the period over which the rational cost is recorded" (ASBJ, 2005, para. 2(15)).

and IASB (2016, paras. IN5 (e) and BC237), the catch-up approach is adopted for accounting for stock options, except for downward adjustment of the per unit fair value of the stock option granted; and (b) since SAR requires remeasuring at fair value of stock options at each reporting date even where there is no adjustment to the allocation plan, there are no provisions for modifications to the terms and conditions on which SARs were granted. Moreover, (c) for FASB ASC (para. 718-20-35-5 and 6), this is interpreted as an exchange for new stock-based compensations, for both stock options and SARs.

Thus, this paper addresses the above-mentioned research questions.

(3) The treatment of forfeiture when the vesting conditions are not satisfied

1. The characteristics of the debate surrounding stock-based compensation

Under major current standards, stock option-related costs are regularly amortized (ASBJ 2005b, para. 4 ; ASBJ 2005c, p. 2). This is because, in general, costs associated with intangible assets, labor services (general compensation costs, including retirement benefit costs), and unobservable assets such as goodwill are regularly allocated using depreciation (AICPA 1970a, para.90 ; AICPA 1970b, paras. 21-23, and 27-31 ; FASB ASC, para. 350-30-35-6). However, since stock option is incentive compensation, if common sense carries the idea that assets should increase in accordance with the additional labor services provided through this grant, then regular amortization can be interpreted as an inappropriate means of handling stock options-related costs (Balsam 1994, 59). However, on the grant date, the contracting parties agree on a

labor contract, exchanging labor services for “stock option (with incentive conditions)” (ASBJ 2005b, para. 64 ; ASBJ 2005c, p.3), and a specific exercise date during the exercise period is determined from the position of the option holder as an investor (speculation) rather than as that of an employee. In such cases, changes in stock prices accompanying the provision of additional labor services will not affect the total cost. Therefore, stock-based compensation costs can be regularly allocated with the consumption of labor services.

Here, I confirm the characteristics of stock-based compensation cost allocation procedures. First, while CF backing is present under conventional cost allocation, a characteristic particular to the allocation procedure for stock options-related cost is that no cash expenditure occurs in a series of transactions. Opinions are, therefore, divided as to the date of the stock option value (or value of labor services) that should be taken as the total allocation value.

Second, the results expected from the agreement of a stock-based compensation contract are not changes in stock prices (i.e. financial investment) but rather the acquisition of CF (i.e. business investment) from the company's autonomous business efforts using such compensation plans. Therefore, stock option-related costs, as with general compensation transactions, to correspond to revenues in each period (rather than the immediately record of their full value) can be derived as costs accompanying labor service expenditures (Paton and Littleton 1940, p. 15).

2. Changes in the number of stock option granted after the grant date: The handling of forfeiture when the vesting conditions are not satisfied.

As stated, this cost allocation may be required to be adjusted when estimates are revised (FASB ASC, para. 250-10-45-20). The first adjustment to the stock-based compensation cost allocation plan is to reflect changes in ex-post quantity in the allocation plan (ASBJ 2005b, para. 7 (2) and paras. 51-53 ; ASBJ 2005c, p. 3. This is because stock options are generally granted to multiple employees, some of whom may leave the company in the middle of the vesting period or fail to meet the vesting conditions. Therefore, even where the number of vested stock options is estimated from the starting grant date, the numbers, including that of employees, may change the fact of de fact (ASBJ 2005b, paras. 7 (2) and 51-53; ASBJ 2005c, p. 3. However, the event occurs after the recording of cost has begun. Therefore, a debate has arisen in accounting as to whether changes in the number should be reflected ex-post in the total stock-based compensation cost (amount of cost per employee multiplied by number of employees), and if it is to be reflected, at which point in time this is to be done.

First, the view that changes in the number of stock options after the grant date should not be allocated at all is based on the following idea. On the grant date, the parties to the contract are considered to have entered into an economically equivalent transaction (including the possibility of leaving the company partway through or forfeiture the conditions) (ASBJ 2005b, paras. 44 and 49-50; ASBJ 2005c, p. 2. Thus, the value

of labor services and the value of the stock option are equivalent on the grant date, and changes in the stock price and in numbers after the grant date can be interpreted as unrelated to the total cost⁴.

However, if the number of grants is used for determining the amount of the cost, and where the cost continues to be recorded without reflecting mid-term retirement, that total cost can be interpreted as having deviated from the true value. In other areas of accounting, since adjustment to the actual number of stock options is generally required where deviation from the true value occurs, even if the total value of stock-based compensation costs is measured on the grant date, the total cost may be revised in accordance with ex-post changes in the numbers (ASBJ 2005b, paras. 7 (2) and 51-53 ; ASBJ 2005c, p. 3) .

There are three specific measurements of cost. First, the following accounting treatment can be derived based on the retrospective approach. stock options are granted to employees as compensation (compensation for labor delivering shares in the future). However, stock options will have value as a reward only after the vesting conditions are satisfied. Accordingly, stock options are not considered commensurable to the value of labor services where their conditions are not vested. Therefore, in accounting, the value of stock-based compensation costs can be recorded using the number of vested or exercised stock options, and when forfeiture occurs, it is possible to adjust retroactively the costs recorded previously to conform to the actual value.

⁴However, the method of calculating the cost using the number of expected rights vested at the grant date is not rejected.

However, even if a stock option does not exercise due to forfeiture when the vesting conditions are not satisfied, it is undisputed that the company received and consumed labor services. In such cases, that fact which occurred in the past, should be faithfully recognized as a cost and even if the conditions are not vested in the future, should not be revised easily. In accordance with this idea, when changes in numbers of stock options occur after the grants of stock options, the value of cost recorded in the past is not retroactively revised. However, an accounting treatment (prospective approach or catch-up approach) can be derived to revise the amount of costs in the period in which an unforeseen event occurs or thereafter (ASBJ 2005b, paras. 7 (2) and 51-53 ; ASBJ 2005c, p. 3). Current standards have adopted the prospective approach to reflect that labor services have been received and consumed in financial statements.

(4) Consideration of accounting treatments for modifying the conditions of stock-based compensation

1. Modification of stock-based compensation

In response to changes in numbers that may occur even where the above allocation plan proceeds successfully, for stock-based compensation, the vesting conditions established on the grant date may be modified to improve employees' motivation to work (ASBJ 2005b, para. 54 ; IASB 2016, paras. 26 and BC222). For example, since the incentive to work is largely reduced where the stock price falls sharply after the grant date and the probability of the exercising of these options decreases, the exercise price can be reduced to rectify this (ASBJ, 2005,b para. 54; IASB 2016, paras. 26 and BC222).

Continuing the previous allocation plan when this modification occurs, the allocation of stock-based compensation costs over the period will deviate from the actual situation of stock-based compensation. Hence, if a change is made to the conditions, a revision of the allocation plan will be required.

Contrary to stock options where the current standards explicitly are required when applying to alter conditions, there is no requirement in applying to SARs when conditions are modified. This may be related to the fact that remeasuring at a fair value of stock options at each reporting date is performed for SARs (FASB ASC, para.718-30-35-1 through 3). Several studies on accounting treatments for stock options, such as Balsam (1994), consider accounting for stock options reconciling accounting for economically equivalent transactions (transactions of SAR). I, therefore, discuss whether remeasuring at fair value of stock options at each reporting date can be a powerful theory when terms are altered.

2. Accounting treatments 1: Adjustment of allocation plans based on remeasuring at fair value of stock options at each reporting date

2.1. The rationale for remeasuring at fair value of stock options at each reporting date for SARs

Even in many practical works, stock option is said to be a type of incentive compensation. In such cases, it is also understood that the increase in costs should be recognized using proxy values such as stock prices to represent the provision of additional labor services accompanying the grant of stock options (Balsam 1994, 59). Behind this lies the idea that changes in the value of labor services are linked to changes in stock prices.

2.2. A logic for revising allocation plans through continuous mark-to-market valuation

Under accounting standards for SAR, stock-based compensation is a type of incentive compensation, and changes in the value of labor services are regarded as linked to changes in proxy values such as stock price (IASB 2016, para. 33 ; FASB ASC, para. 718-30-35-3). Following the above, because the total amount of stock-based compensation costs is remeasured at fair value of stock options at each reporting date, it can be understood that if a modification takes place, no special guidance for the adjustment of allocation plans is required at the date of the modification if the adjustment is made using fair values (FASB ASC, para. 718-30-35-5).

2.3. An argument for business investments (inventories) that refer to market value but do not use fair value

As noted above, stock-based compensation is granted as a consideration for labor services (as part of business investment). Conversely, the accounting treatment obtained in the previous section is generally used for financial investments.

Therefore, I confirm adjustments to allocation plans about inventory transactions that refer to market value, out of business investments. The expectation placed on investment in inventory, as with financial instruments, is to achieve greater results by selling inventory on the marketplace (Paton and Littleton 1940, p. 81 ; ASBJ 2008, para. 37). Inventories are the same as financial instruments as they are held for the purpose of sale. However, since they are sold on a variety of markets with different dynamics, market players, and expectations, the company is able

to manipulate prices through its own sales efforts even if there is no guarantee that a transaction will be concluded (Yoneyama, 2003, pp. 65-66; ASBJ 2008, paras. 11 and 51). Therefore, it is understood that the numbers are adjusted to the true value when the acquisition cost is deferred, and the inventory has been sold (when the physical use and benefit has completely expired) (ASBJ 2008, para. 41).

However, the current standards for inventories in many countries use the lower of the cost or market method, and when per unit prices fall due to damage or reduced quality, or when numbers are reduced due to theft or other reasons, book values are often adjusted to match market value (Paton and Littleton 1940, pp. 79-81; ASBJ 2008, paras. 36-37 ; Yoneyama, 2003, p. 71). Therefore, I review adjustments (that previous studies have yet to examine per unit costs) to allocation plans when environmental changes occur in inventories.

For inventories, when the market value no longer reaches the book value (e.g., where the value has fallen due to market valuation or physical damage), a procedure is applied to reduce the book value according to market value (Paton and Littleton 1940, pp. 79-81 ; Yoneyama, 2003, p. 71 ; ASBJ 2008, para. 37). From the asset and liability view, this is primarily done to preserve the recoverability of the book value of the items shown on the balance sheet, while if examined from the revenue and expense view, it is to correctly calculate profit and loss for the period following the adjustment of the allocation plan (Yoneyama, 2003, pp. 75-76 and 79-80).

In such cases, even if the transaction emphasizes the market value, there will be no remeasuring at fair value of stock options at each reporting date (particularly the upward revision of prices per unit). Accordingly, stock

options—a form of business investment—do not invariably require adjustment of cost at each reporting date, even if the corresponding account for stock-based compensation cost is a liability.

3. Accounting method 2: The exchange of old stock options for new stock options

3.1. Provisions for altering in conditions of stock option-related costs under US standard

Next, I consider the modifications in conditions of stock option under FASB ASC as an alternative accounting treatment. Specifically, the FASB ASC is the same as the ASBJ (2005) and IASB (2016) because, at a minimum, labor services (and their consumption) must be recognized as measured at the fair value on the grant date of the stock option, regardless of any modification or the cancellation or liquidation of the stock option grant (excluding forfeiture when the vesting conditions are not satisfied). Further, FASB ASC treats a change in conditions as an exchange of a new stock option for the original stock option. Below, I consider the significance of this exchange.

3.2. Liquidation of investment and mimicking reinvestment: In relation to the fresh-start method (fair value pooling) for business combinations

First, I can derive the idea that exchanging new stock options for the original stock options leads to the liquidation of, and subsequent reinvestment in, the investment made. Moreover, fresh-start method for business combinations is similar to this idea because the fresh-start method considers business combinations to liquidate the previous control relationship and create a new company (Wilcox

1950, p. 106 ; Wyatt, 1963, p. 82). Thus, the net assets of all the parties in the business combination are recognized at fair value as the starting point of the “new” company, since the company emerging from the business combination is expected to have changed substantially from the company prior to the business combination (Wilcox 1950, p. 106 ; Wyatt, 1963, p. 82). Within the fresh-start method, this is the concept of fair value pooling.

Following this discussion, if labor services are received based on new stock options with new vesting conditions, those labor services can also be interpreted as being different from those previous, and stock-based compensation cost must be allocated over the period on a new accounting basis (allocation plan). In such cases, even if the total allocation of stock-based compensation costs is revised downward from the previous allocation, a new allocation of stock-based compensation costs is made for the period based on the total allocation; this would be a remeasurement made using the fair value on the date of the modification (either stock option or labor services, whichever is more reliable). In other words, this is the catch-up approach.

3.3. Accounting method 3: Continuance of investment at the date of the modification (the logic of current standards)

Conversely, the current standards can be interpreted as being based on the idea that investment continues even if stock options are exchanged. This can be confirmed using a business combination through an exchange of stocks (pooling-of-interests method) (AICPA 1970a, para. 12), as in a business combination by exchange of stocks (between a surviving company and the dissolving company), the

surviving company acquires all the stocks of the dissolving company in exchange for its own stocks. The stockholders of the dissolving company become stockholders of the surviving company, enjoying the risks and returns of the combined company (AIA 1950, paras. 2-3 ; AICPA 1970a, para. 28 ; Coleman 1970, 96). Accordingly, it can be interpreted that even if a share exchange is conducted between the surviving company and the dissolving company, the expectation for the investment remains unchanged, and the company for which expectations are unchanged survives (AIA 1950, para.5; AIA 1957, para.9; AICPA 1970a, paras. 12 and 28).

Applying this to transactions for stock options yields the following: in a business combination through the exchange of old (original) stock options for new stock options, the new stock options acquire all the employees' labor services in exchange for the old stock options (where the per unit price of the new stock options is higher than that of the old stock options), and so the old stock options enjoy the receipt and consumption of the labor services accompanying the allocation of the new stock options. In such cases, even if the old stock options are exchanged for new ones, the expectations placed on an investment are unchanged and can be interpreted as a continuance of stock option investment with expectations remaining unchanged. Therefore, the exchange of old stock options for new stock options may be viewed as similar to a modification under ASBJ (2005) and IASB (2016).

Based on this idea, the next section analyzes the logical necessity of accounting for modification (where we assume investment is continued).

4. Adjustment of allocation plan for stock-based compensation costs based on the logic of amortizable assets

4.1. Procedures for the allocation of unobservable assets

Generally, the costs associated with unobservable assets such as intangible assets, labor services (general compensation tractions, including retirement benefit costs), and goodwill are allocated regularly using this depreciation (AICPA 1970a, para.90 ; AICPA 1970b, paras. 21-23, and 27-31 ; FASB ASC, para.350-30-35-6). The expected outcome of holding these unobservable assets is the acquisition of CF from the company's own business efforts using those assets (ASBJ 2005a, para. 60; ASBJ 2006, Chapter 4, para.57). Correspondingly, the physical utility of this type of asset is understood to gradually decrease and eventually be entirely consumed. To reflect this in accounting treatments, the current standard requires regular amortization corresponding to earnings in a given period (FASB ASC paras. 350-30-35-1 and 2).

4.2. Accounting treatment for modification under Japanese and international financial accounting standards

So, what would be the process for adjusting this allocation plan under current standards? As stated, the ASBJ (2005b, paras.10-12 and paras. 55-56) and the IASB (2016, paras. IN5 (e) and BC237) are broadly similar in their treatment of modification. Specifically (excluding forfeiture when the vesting conditions are not satisfied) regardless of a modification, or the cancellation or liquidation of the stock options, at a minimum, labor services must be recognized measured at fair value on the grant date (ASBJ 2005b, paras. 55-

56; ASBJ 2005c, pp. 4-5). The following revision procedure (excluding situations where the per unit price has fallen; this is addressed using the catch-up approach) is then performed (ASBJ 2005b, paras. 10-12 and 55-57; ASBJ 2005c, pp. 4-5).

First, regarding per unit price, the ASBJ (2005, paras. 10(1) and 55) requires that when a per unit price is adjusted due to a modification, the previous allocation plan of stock options be continued for upward adjustments, and the increase due to the modification be recorded as additional per unit price multiply by the number of stock options. In cases of downward revision, no special revision procedure is used, and the previous allocation procedure will continue (ASBJ, 2005b, para. 10(2); ASBJ 2005c, p. 4 ; IASB 2016, para. B44(a)). Second, a modification leading to an adjustment of the numbers of stock options granted can be interpreted as having been performed with the expectation of an effect in the future, and so the original allocation plan is continued, with the revised amount reflected over the remaining period (ASBJ, 2005b, paras. 11 and 57; ASBJ 2005b, 4; IASB, 2016, para. B43). Third, if the allocation period changes due to modification, the total amount of allocation plan anticipated prior to the modification is recorded over the new remaining period (ASBJ, 2005b, para. 12; ASBJ 2005b, pp. 4-5; IASB, 2016, paras. B43-44).

4.3. Adjustment of allocation plans where expectations placed on the investment are unchanged

As stated in 4.1, the logic of depreciation can be useful in analyzing the allocation of stock-based compensation costs over time. In such cases, discussion of the procedure for

revising estimates of depreciable assets could also serve for the revision of allocation plans. There are broadly two types of revision procedure: (a) a revision required where the purpose for holding an asset does not change (shortening of useful life) (FASB ASC, paras. 350-30-35-9 through 13), and (b) a revision required where the purpose for holding an asset is changed (impairment) (Yoneyama, 1999, p. 380). To anticipate the conclusion, it is believed that stock-based compensation does not align with procedure (b) because, as with retirement benefits, even if the estimate is revised, the expectation that compensation (equivalent value) will be paid to employees in return for the labor services received from employees does not change (Yoneyama, 1999, pp. 380-381; FASB ASC, para. 250-10-45-20). Based on this idea, I analyze revision procedure (a).

4.4. Adjustment of allocation plans (allocation periods) stock-based compensation cost based on the logic of amortizable assets

In an allocation plan for amortizable assets, (a) the observable acquisition cost (total cost of allocation plan) is allocated as cost using a mechanical and regular (b) pattern (assumption), and the cost (depreciation) is recorded in the income statement for each period over its (c) useful life (allocation period) (AIA 1953, Chapter 9, para.5). In revising this plan, it is necessary to consider adjustments of the allocation period in (c), and the accompanying adjustment of the allocation pattern in (b). This is because (for amortizable assets) the total amount of allocation plan in (a) does not need to be adjusted because it is CF that has been spent and fixed in the past. Therefore, I first consider the allocation period

in (c) and associated adjustment of the allocation pattern in (b).

Traditionally, the allocation period (when the physical utility of an amortizable asset is depleted) is considered an estimable event, and costs are allocated so that the book amount reaches zero at the end of the allocation period (Yoneyama, 2003, pp. 9-16; FASB ASC, para. 250-10-45-20). Following this idea, if a revision of the useful life estimate is required, the book amount will not reach zero at the end of the allocation period if amortization continues to be based on the original useful life (Yoneyama, 2003, p. 16). Therefore, the allocation period must be re-estimated, and the allocation pattern be revised so that the book amount at the end of the new pattern of allocation becomes zero (Yoneyama, 2003, p. 16; FASB ASC, para. 250-10-45-20).

Here, three more specific approaches can be considered. However, a company intentionally alters the initial vesting conditions at the date of the modification. Thus, the allocation plan is believed to be correct up to the date of the modification. Therefore, the retrospective approach, which revises the allocation plan previously, can be rejected, and the prospective approach or the catch-up approach can be derived. Then, with the support of adjustment of estimates (recognition of prior service costs and actuarial gain or loss) for retirement benefits—discussed next—the prospective approach can be used under the idea that the adjustment of the estimate should be recognized as swiftly as possible (based on the conservatism), and the catch-up approach (an allocation period spanning the remaining allocation period) can be used if the modification leads to an increase in employees' motivation to work in the future.

5. Adjustment of allocation plans (total amount of allocation plan, i.e., per unit price and number of stock options granted) for stock-based compensation costs based on the logic of retirement benefits

Unlike in the case of amortizable assets, the total amount of allocation plan is not fixed in transactions of stock options. The same is true for SARs and retirement benefits, which are net-cash-settled stock-based compensation (AIA 1956, para.4; AICPA 1966, paras. 11 and 13; IASB 2016, para. BC241). Nevertheless, in AIA (1956, para. 4), uncertainties regarding the determination of pension costs are not so great as to prevent cost allocation, and periodic allocation of these costs is discussed.

Hence, the estimate can be revised even for total amount of allocations where the allocation plan was not revised during the amortizable assets phase. Generally, the total amount of allocation plan (acquisition cost) is calculated as “per unit price multiply by number (number of employees)” (AICPA 1966, para. 2). Therefore, continuing the discussion in the previous section, taking retirement benefits, a compensation transaction for which the total amount of allocation is not fixed, this section discusses revisions to estimates of total allocation (per unit price and number).

5.1. Adjustment of allocation plans for retirement benefit

Generally, although it may be assumed that the pension plans will continue indefinitely, the most important rule to be observed in the allocation procedure is that the total amount of allocation reaches zero at the end of the allocation period (AIA 1956, para.5; AICPA 1966, para. 12; FASB ASC, para. 250-10-45-20). Thus,

if not only the allocation period⁵ but also the total amount of allocation is adjusted, the revision to the estimate is reflected in the periodic profit and loss as actuarial gain or loss (AICPA 1966, para. 25 and Appendix A). Moreover, where adjustment is made to the level of retirement benefit similar to modification, the amount of that adjustment will be recorded as prior service cost (AICPA 1966, para. 17). However, even based on this assumption, there is no unequivocally determined accounting process, and as with adjustments to the allocation period, this can lead to the prospective approach (delayed recognition) and the catch-up approach (immediate recognition) (AICPA 1966, para. 47; Yoneyama, 1999)⁶.

Furthermore, adjustments of the allocation plan are required where retirement benefit obligations (of equal value to the retirement benefits allowance in this case) are reduced due to mid-term retirement (while maintaining a separate allowance for each individual, as with stock-based compensation) (AIA 1956, para.8). Specifically, in the case of general retirement, the difference between the reduction in accrued pension cost and the amount paid to employees (cash expenditure) is handled using the prospective approach as a reversal of retirement benefit costs. This can be interpreted as a correction to the actual amount of the number, as in other fields of accounting.

5.2. Revisions to the number of stock options

I first analyze the number of stock option based on the discussion in the previous section.

⁵ Moreover, in AIA (1956, para. 5), the candidate allocation periods proposed for accounting treatment for pension plans include the remaining service period for eligible employees when the pension plan is adopted and

With regard to numbers of stock options, as set out in Section (3), and not limited to modifications, any deviation between the number set during allocation planning and the actual number of stock options requires revision to reflect the actual amounts, and so the total amount of allocation may be revised to adjust the number of stock options granted accompanying modifications.

Here, following Section 3, there are three specific approaches of adjustment. However, a company intentionally alters the initial vesting conditions on the date of the modification. T recognizes that the allocation plan is correct up to the date of the modification. Thus, the retrospective approach, which adjusts the previous allocation plan, can be rejected, and the prospective approach or the catch-up approach can be derived.

5.3. Adjustments to the per unit price of stock options

By contrast, how do we regard the per unit price of stock options? If, despite revising the estimate of total amount of allocation (total stock-based compensation costs), this fact is not reflected in the periodic profit and loss, the book amount of stock-based compensation costs will not reach zero at the end of the allocation period. The per unit price within the total amount of allocation can therefore be adjusted using the three approaches described above. However, since a company intentionally alters the initial vesting conditions on the date of the modification and the allocation plan is assumed correct up to the date of the modification, the

the total period of the pension plan and the plan that succeeds it (an unlimited period).

⁶ Moreover, FASB/ASC and the ASBJ (2016) require deferred recognition, while IASB (2011) requires immediate recognition.

retrospective approach, which adjusts the previous allocation plan, can be rejected, and the prospective approach or the catch-up approach can be derived.

Then, with the support of revision to estimates (recognition of past service costs and actuarial differences) for retirement benefits, described later, the prospective approach can be used under the idea that the revision of the estimate should be recognized as swiftly as possible (based on a conservative approach), and the catch-up approach (an allocation period spanning the remaining allocation period) can be used if the modification leads to an increase in employees' motivation to work in the future.

Here, under the current standards, there is a shared, asymmetric treatment of increases and decreases in cost; that is, upward adjustment (increases) of per unit prices results in the recording of additional costs, while for downward adjustment (decrease) of per unit price; existing costs are not reduced and periodic allocation is carried out as before (ASBJ 2005b, p. 4). It has been argued that this is not acceptable considering stock-based compensation to be incentive compensation, as exemplified by Balsam (1994) and others. However, using the logic of retirement benefits, we discuss this point as follows.

Since stock-based compensation is incentive compensation, modifications of such compensation are made to destroy the incentives that exist in the original contract and to increase the employees' motivation to work in the future (Brenner et al. 2000 ; Hume and Tokic 2005, 63)⁷. In such cases, a downward adjustment of total stock-based compensation cost during modification should not generally be

done because it leads to rewarding employees for poor performance, which in turn leads to signs of future financial difficulties or high volatility (Acharya et al. 2000 ; Hume and Tokic 2005, 64 and 66). Moreover, IASB (2016, para. BC237) also points out that downward revision of the total amount of stock-based compensation costs must be allowed to prevent profit manipulation by modification of conditions. Correspondingly, the allocation plan can be adjusted only in cases of maintenance of the status quo or that of upward adjustment of the per unit price in the total amount of allocation same as ASBJ (2005b; 2005c) and IASB (2016).

(5) Conclusion

The main conclusions are as follows:

1. Because adjustment of numbers to actual amounts is also performed in other fields of accounting, the number of stock option will be adjusted even when there are no specific modifications. The reason is that in adjusting allocation plans of stock-based compensation cost, an adjustment procedure similar to that of the current standards can be considered as the widely accepted theory. However, in so doing, the retrospective approach is not adopted, to faithfully represent the fact of the receipt and consumption of labor services.
2. Even if the corresponding account for the cost is a liability, adjustment using remeasuring at fair value of stock options at each reporting date is not self-evident.
3. In IASB (2016), accounting treatment for modification for stock appreciation rights that is not self-evident as described in 2, is stipulated so that it is self-evident.

⁷ In Gilson and Vetsuypens (1993), rights-holders were said to prefer stock option price revisions as they reduced

the incentive for taking on high-risk projects in an effort to increase shares.

Moreover, FASB ASC stipulates an accounting treatment by deeming modification as an exchange of new and old stock options, even though the nature of the investment is unchanged. Conversely, under JGAAP, the procedure for modifying the allocation plan for stock-based compensation (regardless of whether the corresponding account of costs is liability or equity) (accounting for adjusting the number and modification) can be a powerful theory.

This paper examined the adjustment of allocation plans for stock-based compensation costs (accounting of changes in the number of issued stock options in the general phase, except in the case of modification and in the case where conditions are modified). This is an allocation issue that has not been well investigated before using normative and descriptive research. Particularly, the paper uses allocation methods and so forth in other accounting fields as a reference framework. The discussion in the introduction is regarding 1) whether accounting treatment of changes in the number of issued stock options in the general phase (except in the case of modification) and where conditions are modified, impacts stock prices and truly provides useful information for investment decision-making (whether it is functioning as originally envisaged); and 2) the kind of financial impact and consequences that such accounting treatment brings to stakeholders (how would corporate behavior change with the application of the accounting treatments discussed here). However, the discussion here does not necessarily reveal clear answers to these questions. Examination of these questions using empirical and analytical methods is, therefore, a subject for further research.

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