Impact of Restricted Stock Grant (RSG) Issuance on Financial Performance of US Software and IT Companies

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ABSTRACT

This study examines the relationship between the issuance of Restricted Stock Grant (RSG) and the financial performance of Software and Information Technology (IT) companies in the United States (US). Data pertaining to RSG and financial performance are obtained from the companies' 10-K reports and the Refinitiv database, respectively. The sample size will include 30 publicly traded companies listed on the US exchange, with a study period spanning from 2013 to 2022. To estimate the effect of RSG issuance on future corporate financial performance, multiple linear regression models will be utilized. Empirical results show that there is a significant positive relationship between the value of RSGs issued (RSGV) and 2-year forward return on assets (ROA). No significant relationships were discovered between RSGV and return on equity (ROE) and between RSGV and Tobin's Q (TQ). The results emphasize the importance for corporate managers to tailor their equity compensation schemes to meet the needs of their employees better. From an investor's perspective, the implications of this study signify the potential for the integration of a novel metric in the evaluation and appraisal of a company's financial potential when making investment decisions.

Keywords: RSG, RSGV, Financial Performance, US, Software and IT, ROA, ROE, Tobin's Q

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INTRODUCTION

1.1 Background and Scope of Work

As the landscape of executive compensation continues to evolve, one trend that has gained momentum in recent years is the adoption of restricted stock units by US public listed companies. In the past, the majority of companies embraced stock options as a means of incentivizing their workforce. However, when the US stock market experienced stagnation or downturns, a predicament arose as the exercise prices of numerous employee-held stock options significantly exceeded the market price of the respective stocks. Consequently, the original objective of employing stock options to motivate and retain skilled personnel diminished in effectiveness. In response to this challenge, coupled with the accounting changes made in 2004 (FAS 123(R)) to treat stock options as normal business expenses, many large prominent corporations such as Alphabet and Microsoft began allocating restrictive stock units as a method of rewarding employees beginning in the early 2000s. Accordingly, the median number of stock options granted by Fortune 1000 firms decreased by 40% between 2003 and 2005, while the median number of restricted stock awards increased by approximately 41% during the same period (Aguilar, 2022). Furthermore, between 2004 and 2010, the number of restricted stock holdings of all reporting executives in the S&P 500 witnessed an increase of 88% (Petra, 2012).

This study aims to investigate the relationship between the value of restricted stock grants granted / tax withheld for net share settlement related to the vesting of restricted stock grants and the financial performance of US Software and IT companies. In particular, the study will assess the impact on two key metrics of accounting performance, namely Return on Assets (ROA) and Return on Equity (ROE), as well as on market performance, as measured by Tobin's Q (TQ). A total of 30 prominent multinational corporations listed on the US exchange will be examined, with

a focus on the period between 2013 and 2022. Restricted stock grant and financial data will be obtained from the companies' 10-K reports and the Refinitiv database, respectively.

1.2 Overview of Restricted Stock Grants

1.2.1 Definition

A Restricted Stock Unit (RSU) or Restrictive Stock Grant (RSG) is an award of stock shares that constitute a form of equity-based remuneration conferred upon employees by an organization. RSGs represent a commitment to allot a predetermined quantity of the company's shares or an equivalent monetary payment to the employee at a specified future date, contingent upon the fulfillment of certain vesting criteria. These criteria often encompass the passage of time, the attainment of performance benchmarks, or a combination thereof. Upon vesting, employees receive the designated shares or cash equivalent, which are subsequently taxed as ordinary income. RSGs serve as a mutually beneficial arrangement for both the company and its workforce, as they foster alignment between employee and shareholder interests while promoting employee retention and long-term engagement. RSGs can take various forms, which can differ based on their vesting schedule, performance metrics, and tax treatment. *Table 1* outlines the most common types of RSGs:

Table 1. Types of RSGs

Type of RSG	**Description**
Time-based	Vested over a specified period, typically annually or quarterly, independent of any other performance metric
Performance-based	Vested based on achieving specific performance goals, such as hitting certain revenue or profit targets
Market-based	Vested based on the company's stock price performance relative to a benchmark, such as the S&P 500. If the company's stock outperforms the benchmark, the RSGs will vest; if it underperforms, they may not.
Reload	Automatically grant additional RSGs when the original RSGs vest
Performance-vesting	Have both time-based and performance-based vesting conditions

1.2.2 RSGs vs Stock Options

While both RSGs and stock options are forms of equity compensation, they have distinctively different features. Some of the notable differences are illustrated in *Table 2* below:

Table 2. Difference between RSGs and Stock options

Feature	**RSGs**	**Stock Options**
Grant price	No grant price	Exercise price
Stock ownership	Granted shares	Purchased shares
Tax treatment	Taxed at vesting	Taxed at exercise
Cost to employee	No upfront cost	Potential exercise cost
Voting rights	No voting rights until shares vest	Vested shares grant voting rights
Risk to employee	Minimal risk	Riskier due to potential exercise cost

The primary distinction between RSGs and stock options resides in the guaranteed acquisition of shares by employees, which becomes particularly pertinent during phases of market decline. For illustration, consider an instance where employee A is allocated 1,000 RSGs during a period when the market value of the company's stock stands at $10. Subsequently, upon the vesting of these RSGs, even if the stock value has depreciated to $9, the shares retain a value of $9,000 (1,000*$9) for the employee. Conversely, employee B is issued 1,000 stock options with an exercise price of $10. In the event that the market price of the stock remains consistently below $10 during the period in which these vested options could be exercised, they would ultimately lapse, rendering them devoid of value to the employee.

1.2.3 Accounting of RSGs

Upon the grant date, the primary occurrence is the creation of an equity account, which will be exactly offset by a contra-equity account. The RSGs fair value at the grant date is debited into the contra-equity account as unearned compensation and the same amount will be credited to the common stock and Additional Paid-In Capital (APIC). At this juncture, there is no impact on the

income statement as no stock-based compensation expense is recognized. Stock-based compensation expense will only be recognized when the RSGs vest.

Assuming the RSGs completely vest in one year and common shares are issued concurrently, the value of the RSGs at the vesting date will be recognized and recorded in retained earnings as a stock-based compensation expense. A debit will be applied to retained earnings and a credit to the contra-equity account for the value at vesting. A visual depiction of the accounting journal entries associated with RSGs is provided below:

At grant date:

	Debit	*Credit*
Contra-equity – Unearned compensation	XXX	
Common Stock & APIC		XXX

At vesting date:

	Debit	*Credit*
Retained earnings – SBC expense	XXX	
Contra-equity – Unearned compensation		XXX

1.2.4 Taxation of RSGs

The taxation of RSGs is dependent on the delivery of shares, and the employee is liable to pay taxes upon vesting. To fulfill the tax obligations at the time of delivery, companies may offer employees a uniform withholding method or a range of options as outlined below:

I. **Net-settlement**: In this approach, the company withholds a portion of the shares to cover the taxes associated with the RSGs and then uses its own cash reserves to pay the taxes prior to delivering the remainder to its employees. This method is the most common practice.

II. **Cash exercise**: In this approach, employees receive all the shares and then personally cover their income tax liability. This results in employees retaining the maximum number of shares.

III. **Cashless exercise**: In this approach, employees sell either the necessary number of shares to cover the income tax liability (sell-to-cover) or all of the vested shares (same-day sale).

When employees ultimately sell their vested shares, they will be required to pay capital gains tax on any increase in the value of the shares over the market price on the date of vesting. However, if the shares are held for a period exceeding one year following the vesting date, any proceeds from the sale will be subject to the more favorable long-term capital gains tax rate.

1.3 Increasing Prevalence of RSGs in Corporate Compensation Packages

RSGs have progressively become a prominent element of equity-based recompense in the recent decade. This method of compensation is ingeniously structured to align the ambitions of employees with the interests of the shareholders, thereby motivating employees to contribute to the company's long-term prosperity. The increasing prevalence of incorporating RSGs into corporate remuneration packages can be traced back to several key factors:

I. **Evolutions in corporate governance and the regulatory ecosystem**: Regulatory bodies and shareholders increasingly emphasize the importance of long-term value creation, aligning with the nature of RSGs as a long-term incentive. Along with greater transparency in executive compensation, RSG issuance has become the preferred option given its more easily explainable and justifiable remuneration structures.

II. **Modifications in accounting standards**: The implementation of new accounting standards encapsulated in the FASB Accounting Standards Codification (ASC) Topic 718 (formerly FAS 123(R)) has influenced the manner in which equity compensation is expensed, leading

to an increased predilection for RSGs over stock options. Furthermore, corporations might view RSGs as more favorable due to their relatively straightforward accounting treatment, which simplifies financial reporting and enhances transparency.

III. **Dynamic labor market competition**: The growing competition for skilled talent across various sectors has compelled organizations to offer more attractive compensation packages, including RSGs as a tool to cultivate loyalty and commitment. As RSGs gain increasing prevalence in the market, companies may adopt them to maintain competitiveness in their compensation structures, thus avoiding being perceived as less attractive employers.

IV. **Shifts in risk perception**: In the aftermath of economic downturns or market volatility, employees may demonstrate a preference for RSGs over stock options, as RSGs retain value even if the stock price depreciates, provided the company remains solvent.

In summary, the increasing prevalence of RSGs in corporate compensation packages can be attributed to transformations in corporate governance, regulatory landscapes, accounting standards, labor market competition, and evolving risk perceptions. These factors have collectively led to the broad acceptance of RSGs as a fundamental component of contemporary equity-based remuneration strategies.

LITERATURE REVIEW AND HYPOTHESES

While there is limited empirical research on the relationship between RSG issuance and company financial performance, the majority of studies have concentrated on stock options or other forms of equity compensation and their association with firms' financial results. Within those studies, many have found a positive relationship between stock option issuance and the companies' future financial performance. For instance, Hillegeist & Penalva (2003) determined that corporations exhibiting unexpectedly high levels of option incentives exhibit significantly higher levels of firm performance. In the same year, Ittner et al. (2003) also discovered that grants lower than anticipated and/or existing holdings of options correlate with poorer performance in the subsequent year, illustrating a positive relationship between stock option holding and firms' financial performance. This positive correlation was reaffirmed by Adel & Amira (2015), who found a positive relationship between the quantity of stock options and the financial performance of Société des Bourses Françaises (SBF) 250 companies between 2006 and 2011. However, Lambert et al. (1989) demonstrated a negative relationship between the adoption of stock options and future profits.

Tai (2018) conducted one of the few studies investigating the relationship between RSG issuance and firms' financial performance. According to Tai, there exists a significant positive correlation between the adoption of restricted stock grants and future firm performance, as measured by sales revenue. His study examined Taiwanese listed (TWSE) and OTC (TWO) companies that had implemented RSGs during the period from July 1, 2011, to December 31, 2013.

In light of these studies, this study proposes Hypothesis 1 (H1) as follows:

H1: The value of RSG granted has a positive impact on the financial performance of US Software and IT companies.

Considering that the majority of companies employ a net-settlement approach for settling the tax payable in relation to the vesting of RSGs, the amount of tax withheld could serve as an indicator of a firm's financial health. For instance, an increase in the amount of taxes withheld by a company could signify an increase in RSG issuance and a concurrent rise in the company's share price. This is because the tax for the RSGs is calculated based on the fair value on the vesting date. If the fair value of RSGs on the vesting date exceeds that on the grant date, it results in more tax being withheld, and the company also records a tax benefit.

The subsequent example elucidates the computation of compensation cost and tax benefit in relation to the vesting of RSGs.

Assumptions:

I. *1 million RSGs are granted at a fair value of $15 per share with a 3-year vesting requirement*
II. *No forfeitures are assumed during the vesting period. At vesting, the stock price stands at $25*
III. *Tax rate applicable throughout all periods is set at 25%*
IV. *Compensation cost is recognized on a straight-line basis*

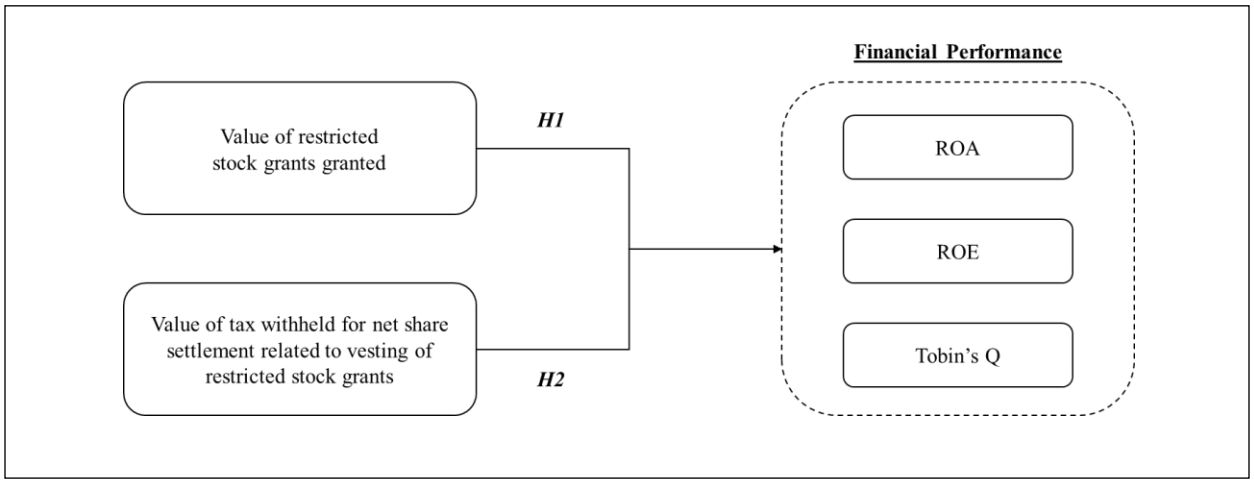
Event	**Details**
Grant Date	-
Recognition of compensation cost over service period (3 years)	Annual entry of $1.25 million deferred tax assets (1 million shares * $15 per share / 3-year service period * 25% tax rate)
At year 3 (before vesting ends)	Total deferred tax assets of $3.75 million
Vesting date	To record tax benefit of $6.25 million (1 million shares * $25 per share * 25% tax rate) and reversal of deferred tax asset. Excess tax benefit of $2.5 million is reflected in the income statement

Given the paucity of research focusing on the tax perspective, this study proposes Hypothesis 2 (H2), derived from the self-analysis presented above:

H2: The value of tax withheld for net share settlement related to the vesting of RSGs has a positive impact on the financial performance of US Software and IT companies.

Figure 1 below outlines the research conceptual framework developed in this study.

Fig 1. Research Conceptual Framework



SAMPLE AND METHODOLOGY

3.1 Data Source, Sample and Collection

In this study, 30 of the largest Software and IT companies incorporated in the US and listed on the US exchange (*Table 3*) were chosen to reflect the performance of large-cap securities that have been adopting RSGs in their long-term incentive compensation programs.

Table 3. List of Selected Companies

Microsoft *(MSFT)*	ServiceNow *(NOW)*	Fortinet *(FTNT)*
Alphabet *(GOOGL)*	PayPal *(PYPL)*	Roper Technologies *(ROP)*
Meta *(META)*	Airbnb *(ABNB)*	Autodesk *(ADSK)*
Visa *(V)*	Uber *(UBER)*	Cognizant Technology *(CTSH)*
Mastercard *(MA)*	Activision Blizzard *(ATVI)*	Electronic Arts *(EA)*
Oracle *(ORCL)*	Palo Alto Networks *(PANW)*	CrowdStrike *(CRWD)*
Salesforce *(CRM)*	Synopsys *(SNPS)*	Copart *(CPRT)*
Adobe *(ADBE)*	Cadence Design Systems *(CDNS)*	Trade Desk *(TTD)*
IBM *(IBM)*	VMware *(VMW)*	ANSYS *(ANSS)*
Automatic Data Processing *(ADP)*	Workday *(WDAY)*	Snap *(SNAP)*

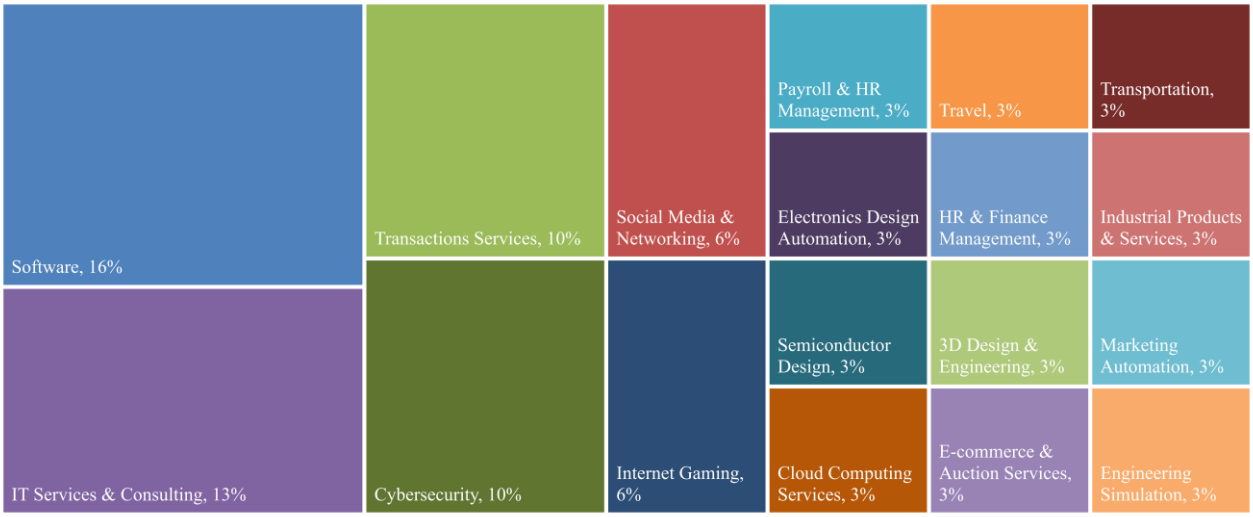
Company tickers are in parenthesis

The primary data source for this study is the annual reports of the 30 companies, collected from the US Securities and Exchange Commission's (SEC) Electronic Data Gathering, Analysis, and Retrieval (EDGAR) system. Data such as RSG granted, RSG vested, RSG forfeited, weighted average grant date fair values and tax withheld related to net share settlement etc. were extracted from the annual reports (or "10-K"). Additionally, Refinitiv is used as a secondary data source for collecting financial performance data for these companies, including market capitalization, total assets, total debt, total shareholders' equity, net income and cash ratio etc. For the period 2013-2022, a total of 276 data longitudinal data points were obtained. After removing outliers and

missing values, 193 observations were used for H1 and 99 observations were used for H2. Overall, the data collection process was conducted in a rigorous and systematic manner to ensure the accuracy and completeness of the data collected.

Figure 2 delineates the distribution of companies by their respective business operations. On the whole, the representation of diverse business activities appears balanced. The most substantial representation is of pure play software companies, accounting for 16%, followed by IT services and consulting at 13%, transaction services and cybersecurity companies each contributing 10%, etc.

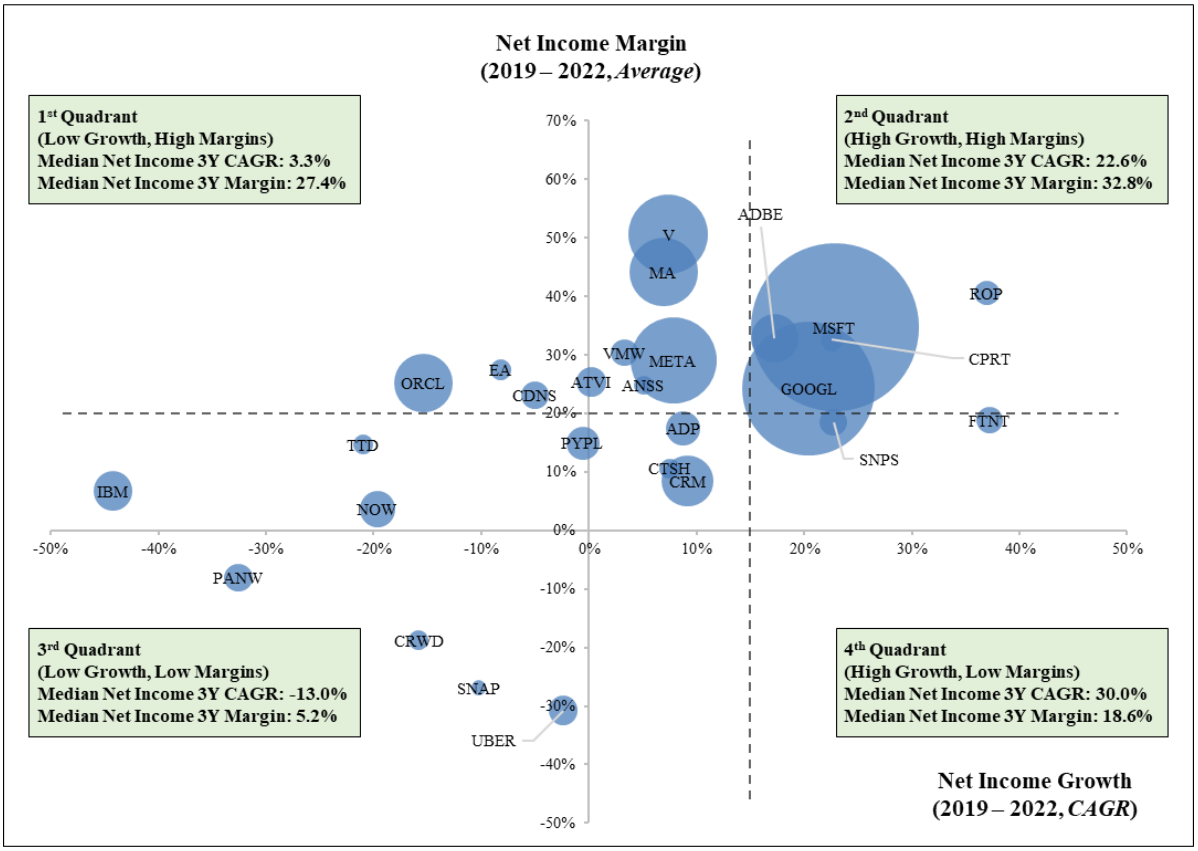
Fig 2. Distribution of Selected Companies by Business Activity



This study employs a quadrilateral classification to gain a comprehensive overview of the standing of 30 technology companies (*Figure 3*). The third quadrant, characterized by low growth and low margins, includes the majority of the companies, with a median Compound Annual Growth Rate (CAGR) of -13.0% over a 3-year span and a median 3-year average net income margin of 5.2%. This trend is unsurprising, as large IT firms often invest substantially in research and development for the conception of innovative products and services. The present economic

and regulatory climate, which includes rising interest rates and stricter government regulations, may not be conducive for these companies to attain superior net income growth and margins. Additionally, issuing stock-based compensation to employees can depress reported net income, as it is categorized as a non-cash expense. On the contrary, the first quadrant, characterized by low growth and high margins, houses larger companies such as Meta, Oracle, Visa, and Mastercard. The median 3-year net income CAGR and 3-year average net income margin in this quadrant stand at 3.3% and 27.4%, respectively. Despite intense competition from smaller, agile startups and a saturated market to expand market share or penetrate new geographies, these firms can sustain high net income margins by capitalizing on economies of scale and retaining robust pricing power.

Fig 3. Benchmarking of Selected Companies



The five companies that outperform the others in terms of net income growth and margins are Adobe, Alphabet, Copart, Microsoft, and Roper Technologies, all situated within the second

quadrant (low growth, high margins). Within this quadrant, the median 3-year net income CAGR and 3-year average net income margin are 22.6% and 32.8%, respectively. Finally, Synopsys and Fortinet, with a median 3-year net income CAGR of 30.0% and median 3-year average net income margin of 18.6%, are the sole representatives of the fourth quadrant (high growth, low margins). Despite their placement in the fourth quadrant, they are closer to the second quadrant than the third.

Upon examining the median number of RSG granted per employee over a 10-year period, a gradual decline in absolute terms is observable, descending from approximately 600 RSG per employee in 2013 to around 300 RSG per employee in 2022 *(Figure 4)*. This trend can be attributed to the recent accelerated hiring activity among the software and IT companies, particularly over the preceding five years. For instance, in the past five years, Microsoft and Alphabet have expanded their workforce by a CAGR of 14.0% and 17.8%, respectively, outstripping their 10-year CAGR by 7.3% and 49.7%. In comparison to the diluted shares outstanding, the median number of nonvested RSG, calculated at the fiscal year-end, remains relatively stable at approximately 2% to 3% between 2013 and 2022. However, it is noteworthy that certain companies, such as Snap, Airbnb, and Uber, have adopted a more aggressive stance in issuing RSGs compared to their more mature counterparts like Microsoft, Adobe, and IBM.

Fig 4. RSG Issuance per Employee and Nonvested RSG as % of Diluted S/O

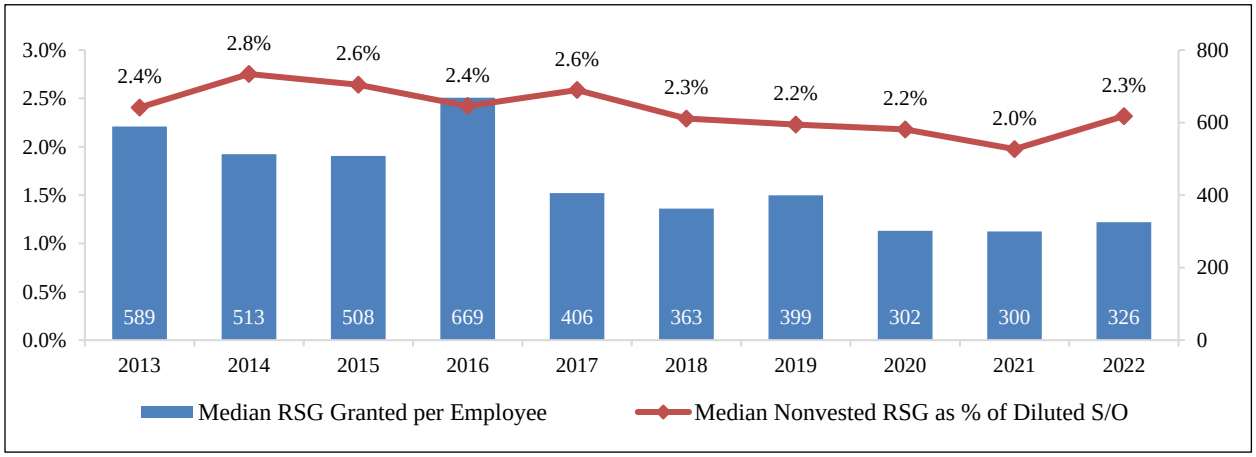
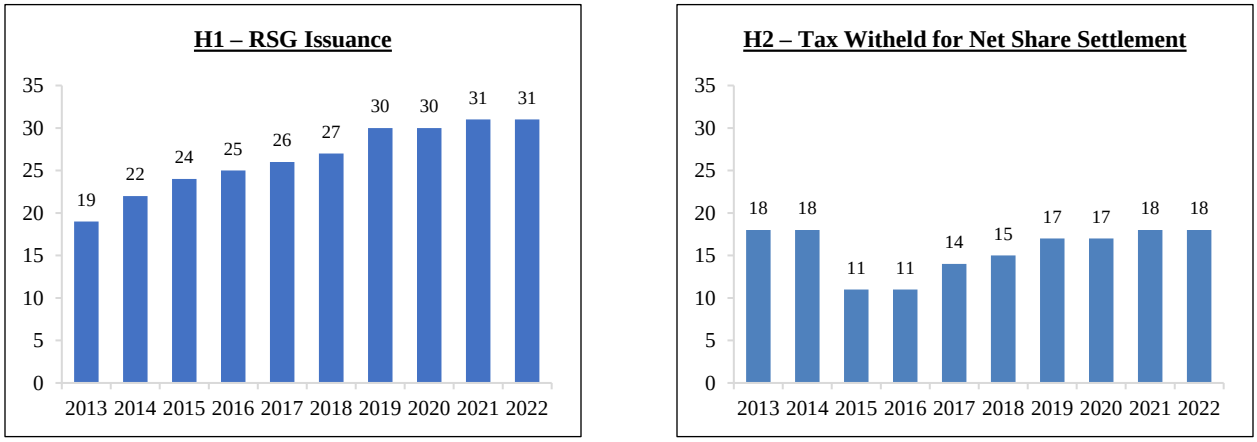


Figure 5 presents the annual distribution of observations for both H1 and H2. It is important to highlight that the total number of observations employed in the regression model is less than the quantity portrayed in the figure as a forward-looking approach was taken, resulting in the omission of data from 2021-2022. Notably, the incidence of amount of tax withheld for net share settlement related to the vesting of RSGs exhibits higher volatility compared to the growth observed in RSG issuance over the 2013-2022 period. One plausible rationale for this disparity may be that firms do not explicitly disclose this information as a separate line item in their financial statements, possibly due to changes in accounting treatments. Alternatively, firms may be deploying diverse strategies to settle all or fractions of the RSGs, engendering further variability.

Fig 5. Distribution of Observations by Year



3.2 Measures

3.2.1 Dependent Variables

In this study, Return on Assets (ROA) and Return on Equity (ROE) are incorporated as measures indicative of accounting performance, while Tobin's Q (TQ) is utilized as an indicator for market-based financial performance. The use of ROA as a predictor of firms' financial performance is a well-established practice in the literature (Yousaf & Dey, 2022). It is expressed

as a percentage derived from the relationship between a company's net income and its total assets. A higher ROA denotes superior efficacy in the management of the balance sheet to yield profits, whereas a lower ROA suggests potential areas for improvement. ROE, on the other hand, measures a company's financial performance by dividing its net income by its total shareholders' equity. The higher the ROE, the better a company is at converting equity financing into profits. TQ is computed by dividing a firm's year-end equity market value by its total assets at the same point. A TQ ratio ranging from 0 to 1 suggests stock undervaluation, as the replacement cost of the firm's assets exceeds the value of its stock. Conversely, a TQ ratio exceeding 1 signifies an overvaluation of the stock, indicating that the firm's stock is more costly than the replacement cost of its assets.

3.2.2 Independent Variables

This study uses the value of RSGs granted and value of tax withheld for net share settlement related to the vesting of RSGs as independent variables for H1 and H2, respectively. Both metrics are retrieved from the companies' annual reports. The value of RSGs granted, measured in US dollars, is computed by multiplying the number of RSGs issued each year by the corresponding weighted average grant date fair value. The value of tax withheld for net share settlement related to the vesting of RSGs is extracted from either the companies' statement of shareholders' equity or statement of cash flows. Considering the heterogeneous reporting of the tax withheld for net share settlement by different firms, this study designates the value as 0 (and hence, omits it from the dataset) if it is not explicitly disclosed in the annual report.

3.2.3 Control Variables

This study incorporates several control variables that could potentially influence the financial performance of firms, namely the cash ratio, revenue growth, firm size, and leverage ratio.

The cash ratio, a liquidity metric, indicates a company's ability to meet its short-term obligations using cash and cash equivalents. This ratio, which is derived by adding a company's

total reserves of cash and near-cash securities and dividing that sum by its total current liabilities, impacts a firm's propensity to implement equity compensation programs based on RSGs. Share-based compensation using RSGs is favored over cash bonuses when companies face liquidity constraints (Yermack, 1995; Dechow et al., 1996).

Revenue growth, represented by the year-on-year percentage change in revenue at fiscal year-end, may also influence a company's financial performance and is thus another critical variable.

Firm size, serving as an indicator of the business growth stage, is pertinent to the issuance of RSGs. Firms oriented towards growth, aiming to align employee performance with shareholder interests, are more likely to issue RSGs compared to their mature counterparts. In addition, larger firms with significant market power can harness economies of scale and scope to garner higher returns. The total number of full-time employees, measured at the end of the fiscal year, is used as an approximation for firm size.

The leverage ratio serves as a proxy for financial reporting costs in this study. Prior research indicates that financial reporting costs affect the structure of a firm's compensation scheme (Yermack, 1995; Bryan et al., 2000). Financial reporting costs tend to increase when firms are required to conform to the financial ratios stipulated in their liabilities contract (Carter et al., 2007; Dichev & Skinner, 2002). The leverage ratio is computed by dividing total debt by total equity at the end of the fiscal year.

Table 4 presents the measures of all model variables.

Table 4. Measurement of Model Variables

Variable	Symbol	Computation	Measure	Source
Dependent variables				
ROA	ROA	Net income / Total assets	[(n+1) + (n+2)] /2	Refinitiv
ROE	ROE	Net income / Total shareholders' equity	[(n+1) + (n+2)] /2	Refinitiv
Tobin's Q	TQ	Equity market value / Total assets	[(n+1) + (n+2)] /2	Refinitiv
Independent variables				
Value of RSG granted	RSGV	No. of RSG granted * Weighted average grant date fair value	US$ millions	10-K
Value of tax withheld	TWHV	-	US$ millions	10-K
Control variables				
Cash ratio	CR	Cash and cash equivalents / Current liabilities	-	Refinitiv
Revenue growth	REVG	Revenue (current) / Revenue (previous) - 1	%	Refinitiv
Firm size	SIZE	Total full-time employees	Thousands	10-k
Leverage ratio	LEV	Total debt / Total equity	-	Refinitiv

3.3 Model Estimation

This study employs multiple regression models to investigate the impact of RSG issuance on the financial performance of 30 Software and IT companies in the US. A multiple linear regression analysis facilitates the identification of a mathematical relationship among several independent, dependent, and control variables. This methodology offers several advantages, including the ability to determine the relationship of each factor with the outcome accurately and precisely. Furthermore, it allows comprehension of the relationship of all factors taken together with the outcome, along with the correlations between the predictor variables (Marill, 2004).

The primary objective of this study is to evaluate the correlation between the value of RSGs granted and the future financial performance of the companies, as well as the correlation between

the value of tax withheld for net share settlement related to the vesting of RSGs and firms' future financial performance. This study utilizes a deductive approach to test and validate the proposed hypotheses. A comprehensive description and definition of all variables incorporated in the model are outlined in *Table 5*. The estimation of all models is conducted using IBM® SPSS® Statistics software.

3.3.1 Model Equation

Table 5. Overview of Model Equations

Hypothesis	**Model**
H1	$ROA/ROE/TQ_{i,n+1;n+2} = \beta_0 + \beta_1 RSGV_{i,n} + \beta_2 CR_{i,n} + \beta_3 REVG_{i,n} + \beta_4 SIZE_{i,n} + \beta_5 LEV_{i,n} + \varepsilon_{i,n}$
H2	$ROA/ROE/TQ_{i,n+1;n+2} = \beta_0 + \beta_1 TWHV_{i,n} + \beta_2 CR_{i,n} + \beta_3 REVG_{i,n} + \beta_4 SIZE_{i,n} + \beta_5 LEV_{i,n} + \varepsilon_{i,n}$

where i stands for the firm; n represents the year; β is the parameter; ε denotes the disturbance

This study employs a dependent variable denoted as $ROA/ROE/TQ_{i,n+1;n+2}$, which represents the average financial performance of firms encompassing the time period of n+1 to n+2. It is worth noting that the variable incorporates a 2-year forward-looking approach since RSGs are usually granted at the end of the year and typically entail a vesting period of three years. As a result, the effect of RSG issuance may not be immediately reflected in firms' financial performance.

Furthermore, the study includes control variables, namely $CR_{i,n}$, $REVG_{i,n}$, $SIZE_{i,n}$ and $LEV_{i,n}$ in the model equations. These control variables are utilized to adjust for the effects of factors that are expected to have an impact on financial performance but are not directly related to the issuance of RSGs.

RESULTS

4.1 Descriptive Statistics and Correlation Analysis

4.1.1 Descriptive Statistics

Descriptive statistics of the various dependent, independent and control variables for H1 and H2 are shown in *Table 6* below.

Table 6. Descriptive Statistics

H1					
	N	**Min**	**Max**	**Mean**	**S.D**
ROA	193	-36.0%	25.7%	6.4%	9.8%
ROE	193	-114.2%	155.3%	15.8%	36.6%
TQ	193	0.75	14.46	4.27	2.77
RSGV	193	0.00[(i)]	17,807.39	1,313.56	2,684.38
CR	193	0.06	3.10	0.77	0.60
REVG	193	-29.7%	110.4%	18.8%	21.7%
SIZE	193	0.70	463.79	51.44	93.05
LEV	193	0.0%	563.0%	52.6%	74.9%

H2					
	N	**Min**	**Max**	**Mean**	**S.D**
ROA	99	-15.7%	25.7%	9.0%	8.3%
ROE	99	-114.2%	195.5%	25.4%	43.6%
TQ	99	0.75	12.99	4.53	2.78
TWHV	99	0.66	5,969.00	598.49	1,193.41
CR	99	0.09	3.10	0.86	0.66
REVG	99	-21.3%	60.7%	16.1%	17.2%
SIZE	99	0.70	463.79	58.78	109.01
LEV	99	0.0%	563.0%	60.8%	95.9%

(i) Minimum value of US$3,520

The data presented in *Table 6 – H1* indicates that the mean value of RSGV is US$1,313.56 million, accompanied by a standard deviation of US$2,684.38 million. It is noteworthy that there exists a considerable gap between the maximum and minimum RSGV values, signifying the high volatility of RSG issuance amounts across companies. Similar trends can be identified in the statistics pertaining to TWHV under *Table 6 – H2*.

4.1.2 Correlation Matrix

Table 7. Correlation Matrix – H1

Variables	ROA	ROE	TQ	RSGV	CR	REVG	SIZE	LEV
ROA	1							
ROE	.632**	1						
TQ	.014	-.017	1					
RSGV	.201**	.032	-.038	1				
CR	.079	-.067	-.002	.052	1			
REVG	-.457**	-.458**	.437**	.060	.119	1		
SIZE	.144*	.269**	-.370**	.142*	-.210**	-.311**	1	
LEV	-.067	.246**	-.161*	-.081	-.061	-.220**	.495**	1

*** Correlation is significant at the 0.01 level (2-tailed)*
** Correlation is significant at the 0.05 level (2-tailed)*

Table 7 above presents the results of the correlation analysis of all variables for H1. The analysis reveals that RSGV is positively and significantly related to ROA (.201**), but not with ROE and TQ. Furthermore, RSGV has a positive correlation with SIZE (.142*), suggesting that larger firms are more likely to issue a higher overall value of RSG than their smaller counterparts. The weak positive correlation between CR and ROA and weak negative correlations between CR and ROE/TQ are all not statistically significant. CR only has a strong negative correlation with SIZE (-.210**). It is interesting to note that while REVG is negatively and significantly related to ROA (-.457**) and ROE (-.458**), it is positively related to TQ (.437**). This indicates that growth in revenue may not translate proportionately to net income. On the other hand, growth in revenue increases overall firm value. It is noteworthy that SIZE is significantly correlated with all the dependent and independent variables. The corporate level of debt is positively correlated with ROE (.246**) but negatively correlated with TQ (-.161*). Indeed, increasing leverage can potentially incentivize managers to make better decisions that benefit the company's shareholders

in order to ensure the company's financial stability and ability to meet its debt obligations (Jensen, 1989). As the level of debt increases, the denominator of TQ equation increases, which in turn decreases the overall ratio. This explains the negative relationship between LEV and TQ.

Table 8. Correlation Matrix – H2

Variables	ROA	ROE	TQ	TWHV	CR	REVG	SIZE	LEV
ROA	1							
ROE	.444**	1						
TQ	.213*	.068	1					
TWHV	.237*	-.033	-.090	1				
CR	.182	-.005	-.111	.023	1			
REVG	.010	-.343**	.489**	.150	.182	1		
SIZE	-.029	.222*	-.477**	.084	-.233*	-.414**	1	
LEV	-.125	.359**	-.235*	-.169	-.141	-.417**	.696**	1

*** Correlation is significant at the 0.01 level (2-tailed)*
** Correlation is significant at the 0.05 level (2-tailed)*

Table 8 above presents the results of the correlation analysis of all variables for H2. TWHV is positively and significantly related to ROA (.237*), but not with ROE and TQ. No other significant relationships exist between TWHV and the rest of the variables. Similar to the relationships found in H1, REVG is negatively and significantly related to ROE (-.343**) but positively related to TQ (.489**). Additionally, REVG has a significant negative relationship with SIZE (-.414**) and LEV (-.417**), indicating that smaller firms tend to outgrow their larger counterparts. This makes intuitive sense given that smaller firms are more likely to be in the growth phase of their business cycle. Moreover, these smaller firms do not have the same capacity as their larger counterparts in tapping into the debt market for fundraising and therefore rely more on equity as a source of capital. Again, this correlation matrix shows that LEV is negatively correlated with TQ (-.235*) which is consistent with the previous findings.

Given that a key assumption for a regression-based model is that independent variables should not be correlated with each other, a Variance Inflation Factor (VIF) test (*Table 9*) is conducted to detect the presence of multicollinearity. Since all the VIF values are less than 5, there is no presence of serious multicollinearity (James et al., 2021).

Table 9. VIF Test

H1		
Independent Variables	Collinearity Statistics	
	Tolerance	*VIF*
RSGV	.932	1.072
CR	.942	1.062
REVG	.886	1.129
SIZE	.647	1.546
LEV	.725	1.380

H2		
Independent Variables	Collinearity Statistics	
	Tolerance	*VIF*
RSGV	.871	1.149
CR	.933	1.072
REVG	.771	1.298
SIZE	.436	2.293
LEV	.452	2.210

4.2 Regression Output

Table 10 reports the estimation results for the H1 model. The different regressions of the RSGV on the three selected performance indicators, including control variables (cash ratio, revenue growth, size and leverage ratio) are displayed accordingly below.

Table 10. Regression Results for RSGV and Financial Performance – H1

Regressors	**ROA**		**ROE**		**TQ**	
	Estimate	*t-stat*	*Estimate*	*t-stat*	*Estimate*	*t-stat*
Constant	8.870**	6.830	23.062**	4.546	4.124**	10.920
Independent Variable						
RSGV	0.001**	3.100	0.001	0.852	-4.968E-06	-0.074
Control Variables						
CR	2.198*	2.140	0.115	0.029	-0.495	-1.658
REVG	-0.226**	-7.734	-0.694**	-6.081	0.047**	5.523
SIZE	0.009	1.125	0.028	0.908	-0.009**	-3.990
LEV	-0.025**	-2.722	0.061	1.659	0.002	0.908
Observations	193		193		193	
R^2	0.304		0.240		0.265	
F-stat	16.349**		11.819**		13.513**	

*Note: Table above shows the regression output for the H1 model, indicating the link between RSGV and firms' financial performance. Robust standard errors for the test's statistics, significant at the **0.01 and *0.05 level*

Overall, RSGV has a positive and significant relationship with ROA (0.001**), suggesting that issuing a higher overall value of RSG translates to an increase in return on assets. Therefore, H1 is supported by the ROA model. However, no significant relationship can be concluded for ROE and TQ. In terms of control variables, CR has a positive relationship with ROA (2.198**) but not ROE and TQ. REVG is negatively related to ROA (-0.226**) and ROE (-0.694**) but positively related to TQ (0.047**), indicating that growth in revenue may not translate proportionately to net income. On the other hand, growth in revenue increases overall firm value as investors view revenue growth as a positive signal for a company's future prospects and profitability. SIZE has a negative relationship with TQ (-0.009**) while LEV has a negative effect on ROA (-0.025**). While the R-squared values may not be very high, the statistically significant

F-statistics indicate that the regression models as a whole are reliable and useful in explaining the variation in the dependent variables.

Table 11 reports the estimation results for the H2 model. The different regressions of the TWHV on the three selected performance indicators, including control variables (cash ratio, revenue growth, size and leverage ratio) are displayed accordingly below.

Table 11. Regression Results for TWHV and Financial Performance – H2

Regressors	**ROA**		**ROE**		**TQ**	
	Estimate	*t-stat*	*Estimate*	*t-stat*	*Estimate*	*t-stat*
Constant	7.244**	3.895	24.404**	2.633	4.807**	9.829
Independent Variable						
TWHV	0.002*	2.074	0.003	0.781	-1.258E-04	-0.653
Control Variables						
CR	2.354	1.833	4.100	0.641	-1.176**	-3.483
REVG	-0.044	-0.811	-0.688*	-2.549	0.071**	4.971
SIZE	0.004	0.364	-0.053	-0.946	-0.014**	-4.749
LEV	-0.012	-0.937	0.164*	2.600	0.008*	2.482
Observations	99		99		99	
R^2	0.100		0.190		0.447	
F-stat	2.074		4.358**		15.036**	

*Note: Table above shows the regression output for the H2 model, indicating the link between TWHV and firms' financial performance. Robust standard errors for the test's statistics, significant at the **0.01 and *0.05 level*

Overall, TWHV has a statistically significant positive relationship with ROA (0.002*), but not with ROE and TQ. This suggests that higher amounts of tax withheld for net share settlement related to the vesting of RSG increases firms' return on assets. The control variable CR has a negative relationship with TQ (-1.176**), indicating that firms with high levels of cash holdings may be seen as less efficient by investors, leading to lower overall valuation. Similar to H1 models,

REVG is negatively related to ROE (-0.688*) but positively related to TQ (0.071**). SIZE has a negative relationship with TQ (-0.014**) while LEV has positive effects on ROE (0.164*) and TQ (0.008*). Even though H2 is supported by the TWHV coefficient within the ROA regression model, its low R-squared and non-significant F-statistic suggest weakness in fit and lack of predictive quality. Similarly, although the ROE and TQ models have better model fit and are statistically significant at 1% levels, there is no significant relationship between TWHV and the financial performance indicators. Therefore, all in all, there is no substantive evidence to conclude that TWHV has a positive relationship with firms' future financial performance.

CASE STUDY

5.1 Alphabet Inc. – Positive Financial Impact of RSG Issuance

5.1.1 *Introduction*

Alphabet Inc. (or "Alphabet") is a multinational conglomerate and the parent company of Google, YouTube, and various other subsidiaries, operating in a highly competitive technology sector. Over the past decade, Alphabet has been a frontrunner in innovation and business strategy. One such strategy was the adoption of RSGs as a means to incentivize employees and align their interests with those of shareholders. This case study seeks to analyze the impact of RSG issuance on Alphabet's ROA and share price movements over the last decade.

5.1.2 *Adoption of RSGs by Alphabet Inc.*

Since its IPO in 2004, Alphabet began granting RSGs (or "GSUs") to its employees, based on its 2004 stock plan. The adoption of GSUs emerged as a response to the competitive labor market in the technology industry, with the goal of retaining top talent and attracting new talent. Additionally, GSUs were intended to align employee interests with those of the shareholders, promoting long-term commitment and performance. The percentage of end-of-year unvested RSGs over total diluted shares outstanding hovered around 6%-7% during the first few years since IPO. This percentage has since stabilized at around 2.5% over the most recent five years.

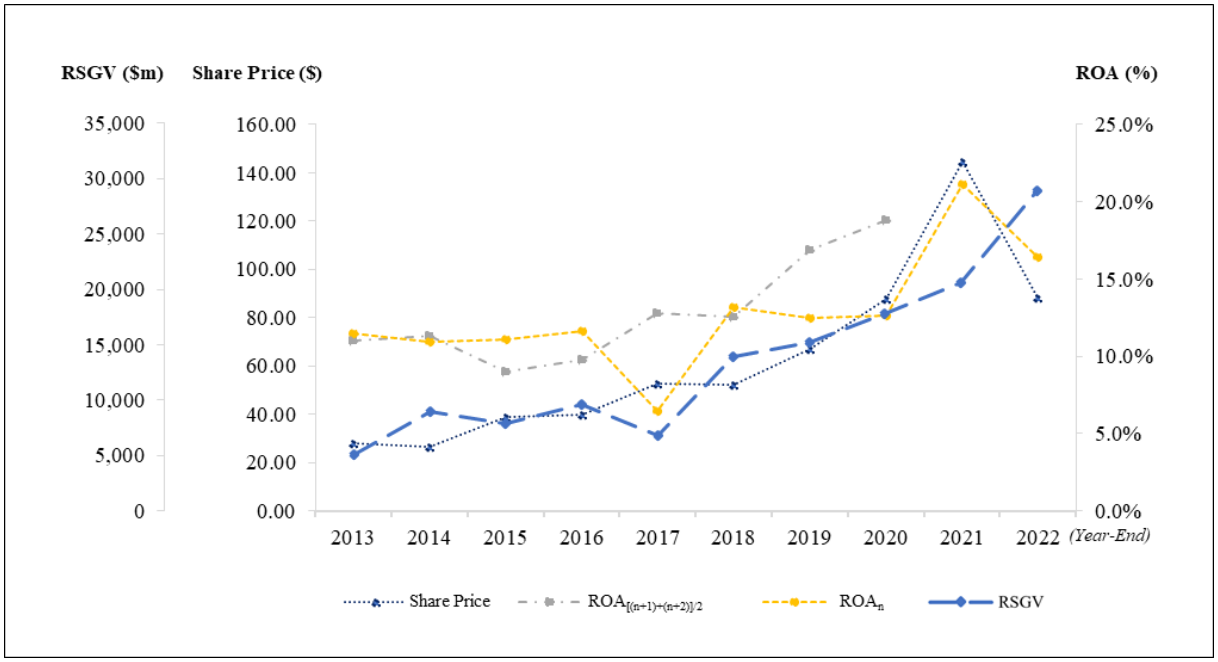
A GSU represents the right to receive one Alphabet share upon vesting and typically comes with a 4-year vesting period, with a 1-year cliff and does not entitle the employee to receive any dividends. This means that after the first year of employment, 25% of the granted GSUs vest, and the remaining GSUs vest on a monthly or quarterly basis over the next three years. In some cases, Alphabet might offer a different vesting schedule, depending on the employee's role, seniority, or other factors. A cliff is a period during which no GSUs vest. In Alphabet's standard GSU policy,

employees must remain with the company for at least one year (the 1-year cliff) before any GSUs start to vest. If an employee leaves the company before the 1-year mark, they forfeit all unvested GSUs. These GSUs are also non transferrable and will not be subject to sale until the employee has been issued the units.

5.1.3 *Financial Impact*

Figure 6 below shows overall upward trend across all metrics over the last decade expect for years 2018 and 2021 when the US-China trade war and COVID-19 erupted, respectively. There is a significant positive relationship between value of RSG issued (denoted by RSGV) and current year ROA (denoted by ROA_n), 2-year average forward looking ROA (denoted by $ROA_{[(n+1)+(n+2)]/2}$), as well as share price, further cementing the validity of H1 of this study – higher overall value of RSG translates to an increase in return on assets. While the movements of ROA_n and share price seem more volatile during the last decade, the movement of $ROA_{[(n+1)+(n+2)]/2}$ is observably more in sync with that of the RSGV, indicating even stronger corelation between the two metrics.

Fig. 6 Financial Impact of RSG Issuance on ROA and Share Price – Alphabet



Alphabet’s share price also exhibits an overall rising trend, indicating that the market acknowledges the positive impact of granting RSGs to align the interest between the company and its employees and also at the same time incentivize them to focus on long-term prosperity.

5.1.4 Conclusion

RSG issuance has indeed positively influenced Alphabet's financial performance over the past decade. The company's revenue, net income, and market capitalization have all increased substantially during the RSG grant and post-RSG grant periods, reflecting improved business operations and market confidence. Moreover, Alphabet has successfully retained top talent and attracted new employees, which may be partially attributed to the RSG compensation system. RSGs have likely contributed to an increase in employee satisfaction and loyalty, as they offer a long-term incentive for employees to continue working for the company and contributing to its success. The alignment of employee and shareholder interests through RSGs has also helped foster a performance-driven culture, which has positively impacted the company's financial performance.

5.2 Snapchat Inc. – Aggressive RSG Issuance with No Significant Financial Impact

5.2.1 *Introduction*

Snapchat Inc. (or "Snapchat"), an American multimedia messaging app company, has emerged as a global player in the technology industry since its inception in 2011. Its innovative and highly engaging platform has attracted millions of users worldwide. In an effort to attract and retain top talent, Snapchat has leveraged various compensation strategies, including the adoption of RSGs as a significant component of employee compensation. This case study aims to investigate the impact of Snapchat's RSG issuance on the company's financial performance, focusing on ROA and share price movements over the past decade.

5.2.2 *Adoption of RSGs by Snapchat Inc.*

Snapchat first started issuing RSGs to its employees in 2014, as part of its efforts to attract and retain top talent in the competitive technology industry. The adoption of RSGs was part of Snapchat's broader compensation strategy, which also included stock options and cash bonuses. The company went public in 2017, and the issuance of RSGs continued post-IPO. During the early years since its IPO, Snapchat adopted an aggressive RSG issuance approach where the percentage of end-of-year unvested RSGs over total diluted shares outstanding were 15.6%, 38.0% and 14.0% for years 2015 to 2017, respectively. Compared to the industry median of 2.8% and its start-up peers' (Airbnb, Uber, Snowflake etc.) average of 12.1% during the first 3 years of establishment, the amount of RSGs Snapchat issued is unparalleled at that time.

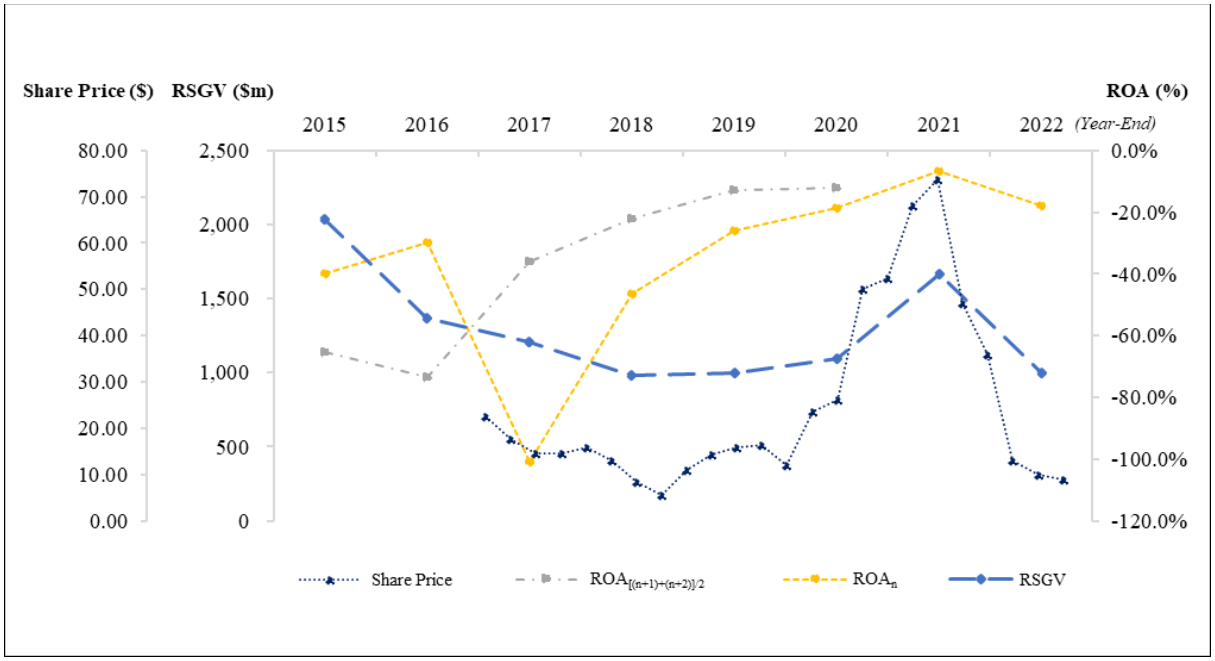
Snapchat's RSG represents the right to receive one share of the company's common stock upon vesting. Prior to February 2018, Snapchat's RSGs are generally vested over four years: 10% after the first year of service, 20% over the second year, 30% over the third year, and 40% over the fourth year (10%/20%/30%/40% vesting). This schedule has since changed to equal monthly or quarterly vesting over three or four years. Similar to most other RSGs, Snapchat's RSGs do not

entitle employees to receive benefits or adjustments with respect to any cash or stock dividends. There RSGs are also non transferrable and will not be subject to sale until the employee has been issued the units.

5.2.3 *Financial Impact*

While Snapchat may have managed to attract and retain top industry talents with its aggressive RSG issuance approach, repercussions of this strategy could be seen from the negative impact on the company's share price due to potential excessive dilution. Snapchat's IPO in March 2017 saw the share price open at $24 per share. However, it quickly fell below the IPO price, reaching a low of $11.28 per share in August 2017. While there is a brief uptick in the share price, to $15.44 per share on August 7, 2017, the share price subsequently continued to be volatile for the remainder of the year. Eventually Snapchat recorded it lowest ever share price of $4.99 per share in December 2018.

Fig 7. Financial Impact of RSG Issuance on ROA and Share Price – Snapchat



According to *Figure 7*, during the same period, current year ROA (denoted by ROA_n) and 2-year average forward looking ROA (denoted by $ROA_{[(n+1)+(n+2)]/2}$) experienced an overall rising trend even though the value of RSG issued (denoted by RSGV) fell. This contradicts H1 and observations indicate no plausible relationship between the variables. A possible reason could be because Snapchat's 10%/20%/30%/40% RSG vesting schedule, coupled with sustained aggressive RSG issuance backfired and employees no longer felt their interests were aligned with the company. At the same time, Snapchat was facing stiff competition induced by rival apps such as Facebook, Instagram, TikTok etc., given the rising challenge to grow its user base.

In the following years (2019 – 2022), Snapchat's share price experienced a rollercoaster ride, rocketing over 1,000% from its lowest point due to record revenue from new initiatives and plummeting 90% due to Apple's privacy changes in April 2021, followed by a slew of compounding effect from the Russia-Ukraine war and interest hikes.

5.2.4 Conclusion

While Snapchat's RSG issuance policy was aggressive, there is no significant relationship between RSG issuance and financial performance. Even though the aggressive RSG issuance may have impacted Snapchat's share price to a certain extent due to investors fearing the potential dilutive effects, the extreme volatility exhibited in the share price was in fact due to an amalgamation of various business, financial and macro-economic factors. As such, the conclusions of this study may not be ultimately applicable to companies like Snapchat.

CONCLUSION

6.1 Discussions

To date, research on the relationship between restricted stock grants (RSGs) and the financial performance of companies has achieved limited advances. More attention has been paid to the stock option context and its associated implications when it comes to the stock-based compensation topic. This study addresses this gap in research by examining two relationships: one between the value of RSGs granted (RSGV) and the financial performance of companies and the other between the value of tax withheld for net share settlement related to the vesting of RSGs (TWHV) and the financial performance of companies.

The sample in this study consists of a total of 193 and 99 observations for each of the hypotheses from the period between 2013 and 2022. The observations in the sample are composed of 30 of the largest public-listed Software and IT companies in United States. RSG and tax-related data for the companies were retrieved from the 10-K while financial data were obtained from the Refinitv database. Several control variables were incorporated into our model including cash ratio, revenue growth, firm size and leverage ratio.

The results of this study indicate that RSGV has a positive relationship with 2-year forward Return on Assets (ROA). Revenue growth shows a negative impact on ROA and Return on Equity (ROE) but a positive impact on Tobin's Q (TQ), indicating that growth in revenue may not translate proportionately to net income. On the other hand, growth in revenue increases overall firm value as investors view revenue growth as a positive signal for a company's future prospects and profitability. The results also indicate no substantive evidence to conclude that TWHV has a positive relationship with the firm's future financial performance.

This study provides practical implications for corporations and investors. Company managers can better design their equity compensation incentive programs and tailor them to their employees' needs while leveraging on adoption and issuance of RSGs. At the same time, strategic issuance of RSGs can potentially be a signal to attract investors to invest in the long-term financial growth of the company. From an investor point of view, RSGV can be a new metric in valuing and assessing the financial potential of a company before making investment decisions.

6.2 Limitations

This study has several limitations. Firstly, although the sample encompasses a diverse range of enterprises at distinct developmental stages and exhibiting varied growth and profitability, it could be broadened to generate a more exhaustive set. In subsequent research, the inclusion of smaller firms may ensure that the sample better represents the entire population.

Secondly, the 10-year timeframe chosen for this study could be extended, particularly considering that numerous companies have implemented RSG as their equity compensation strategy for over a decade. Additionally, by adopting a lengthier temporal scope, anomalous data points resulting from unforeseen events, such as the US-China trade conflict and the COVID-19 pandemic, could be further mitigated to enhance the models.

Thirdly, while this study concentrates solely on software and IT enterprises, future studies could incorporate firms from other industries and sectors. The effects of industry-specific factors could be more thoroughly controlled to ascertain their influence on the dependent variable.

Fourthly, the study's focus on United States-based companies restricts its applicability to those in developing economies. Given that RSG issuance has gained popularity in China's semiconductor industry as a means of attracting skilled professionals (Jhygdfc, 2022), future research could include enterprises from emerging markets.

Lastly, this investigation employs ROA, ROE, and TQ as financial performance indicators, which may prove insufficient. Alternative metrics could be explored to determine their relevance as variables in forthcoming studies.

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