

LOOKING FOR ANOTHER PIECE: AN ANALYSIS OF THE DIVIDEND PUZZLE

by

Frederick Bosshardt III

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Project Approved:

Supervising Professor: Douglas Butler, Ph.D.

Department of Economics

Kiril Tochkov, Ph.D.

Department of Economics

Swaminathan Kalpathy, Ph.D.

Department of Finance

## **ABSTRACT**

This paper aims to contribute to the dividend puzzle via the synthesis of theoretical distribution theories and real-world distribution analysis practices. This paper provides brief introductions to the dividend puzzle, dividend history, and investment tax history, reviews of the most widely researched distribution theories, and an application of economic theory to a financial industry test developed by famous investor Warren Buffet.

My contribution to the dividend puzzle is incorporating the Law of Diminishing Marginal Utility into Buffet's \$1 Test to show points of optimal distribution for a given required rate of return. This report contains several equations and multiple graphs to illustrate the subject matter. I hope the structure of this paper promotes future research on the topic.

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## **Introduction**

### *The Dividend Puzzle*

The Dividend Puzzle is a financial concept that highlights inconsistencies between theoretical economic perspectives and real-world financial industry observations. And according to Fischer Black, a famous economist who focused his career at the intersection of applied finance and theoretical economics, “The harder we look at the dividend picture, the most it seems like a puzzle, with pieces that just don’t fit.” (Black, 1998) Researchers of the dividend puzzle have crafted a myriad of explanations, hoping to help explain why firms pay dividends and why investors pay attention to them. However, no combination of these explanations has led to an empirically-proved solution.

The importance of the dividend puzzle is in the application of its solution towards the creation of a standard optimal dividend policy. At the end of his article, “The Dividend Puzzle,” Fischer Black asks the question, “What should the corporation do about dividend policy?” and replies, “We don’t know.” (Black, 1998) To Black's point, there is no singular correct formula for the distribution of dividends. Naturally, there is a great deal of variance associated with the answers to why firms pay dividends and why investors pay attention to them. While every dividend-paying firm applies its own specific dividend policy, the universal use of an optimal distribution policy would grant both managers and investors a quantitative metric to evaluate and compare the financial health of firms.

Throughout this paper, and in line with previous explorations of the dividend puzzle, all analyses will be held in agreement with the Friedman Doctrine: "the manager is the agent of the

individuals who own the corporation ... and his primary responsibility is to them.” (Friedman, 1970)

### *Dividend History*

The United States Bureau of Economic Analysis (BEA) defines dividends as a form of income that shareholders of corporations receive for each share of stock that they hold.

The first company to ever distribute dividends was the first company to go public, the Dutch East India Company (Petram, 2021). These early dividends were distributed to reduce the risks associated with and incentivize long-term holdings in the company. The Dutch East India Company chose to share its profits with investors so that the shareholders could realize a monetary return without liquidating their shares in the company (Petram, 2021). In other words, the first dividends were issued to mitigate shareholders' cashing out on unrealized gains in increased stock prices. Today, many companies utilize evolved dividend policies that transcend the early modern era practice of distributing dividends as a means for forestalling investors from selling their shares. Still, some companies have not.

When a healthy business generates free cash flows, managers of the said business can hold the profits for reinvestment into the business or distribute them to shareholders. The former option is defined as retained earnings; the latter option is frequently done via dividends. Regardless of the vehicle, however, this distribution of earnings represents a management team's decision to limit their reinvestment in the

business, and the reasons for doing so are many. Although simple, these basic concepts of dividends must be defined since they are frequently misunderstood by real-world retail traders alike.

Several fallacies exist regarding dividends and the purpose of distributing them. Additionally, while most investors know dividends to be cash considerations, there are actually few regulations that restrict the magnitude or kind of dividends. Cash dividends are certainly the most common form of dividends. However, companies can also issue stock dividends (payment made in the form of shares of additional shares in the company), property dividends (payment made in the form of some non-monetary or physical assets), scrip dividends (payment made in the form of a short-term certificate that can be redeemed for some monetary asset or additional shares in the company), and bond dividends (payment made in the form of a long-term, interest-bearing certificate that can be redeemed for some monetary asset or additional shares in the company).

This paper will primarily focus on cash dividends, but acknowledging the flexibility of dividend regulation helps shed additional light on the dividend puzzle conversation.

### *Investment Tax History*

The first federal capital gains tax was introduced alongside the first federal income tax with the passage of the 16<sup>th</sup> Amendment in 1913. At this time, however, dividend income received by investors was entirely exempt from federal taxes. Aside from a two-year spell in the late 1930s, this lack of taxation on dividends survived until the early 1950s, at which time dividends began being taxed as ordinary income tax rates. The birth

of a dividend tax set an important precedent because, after that change, dividends received by investors were double-taxed: once as a company's earnings and once as an investor's dividends. Additionally, after the dividend tax rate switched to ordinary rates, an investor's dividend tax rate was determined by the sum of said investor's total tax liability, including dividend income. This simple approach to taxing dividends remained in place until the creation of the Jobs and Growth Tax Relief Reconciliation Act of 2003.

This tax bill added another tranche to the field of investment taxation and installed the tax structure that is still used today. From 1913 to 2003, the capital gains taxes changed frequently, and the dividend tax did not, but the taxation for both capital gains and dividends was made more complicated with the invented distinctions of long-term capital gains versus short-term capital gains and qualified dividends versus ordinary dividends. Short-term capital gains and ordinary dividends are taxed as ordinary income, whereas income from long-term capital gains and qualified dividends are taxed at rates lower than ordinary income.

The Jobs and Growth Acts seeks to incentivize investor preference towards long-term capital gains and qualified dividends over short-term capital gains and ordinary dividends, respectively. The question is, what is required of investors to receive the benefits of long-term capital gains and qualified dividends? Holding an asset for more than one year before disposing of it defines a long-term capital gain, and holding a stock "for more than 60 days during the 121-day period that begins 60 days before the ex-dividend date" results in its dividends being considered qualified (IRS, n.d.).

These additions to the capital gain tax and dividends tax reduce the amount of tax



paid on income from investments that meet certain holding times requirements. Thus, the Jobs and Growth Act clearly seeks long-term incentive investment and inhibit short-term investment. The use of tax to influence the actions of the public is not uncommon, and evidently, the effect of government interaction, especially via changes to tax laws, can manifest itself in the returns an investor receives from their investment.

Regarding incentives created by the Jobs and Growth act of 2003, it should be noted that, per Table 1, the highest marginal tax rate was equal in 2003 for both capital gains and dividends, increased in 2013 only for capital gains, and converged again in 2018 for both capital gains and dividends, with the increase for dividends.

(Table 1)

<b>Year</b>	<b>Maximum Capital Gains Rates<sup>1</sup></b>	<b>Maximum Dividends Rates<sup>2</sup></b>
1913–1921	Individuals income tax rate	Exempt
1922–1933	12.50%	Exempt
1934–1935	17.70%	Exempt
1936	22.5%*	Exempt
1937	22.5%*	Individuals income tax rate
1938–1939	15.00%	Individuals income tax rate
1939–1941	15.00%	Exempt
1942–1951	25.00%	Exempt
1952–1953	26.00%	Exempt
1954	25.00%	Individuals income tax rate (Max 90%)
1955–1967	25.00%	Individuals income tax rate (Max 90%)
1968	26.90%	Individuals income tax rate (Max 90%)
1969	27.50%	Individuals income tax rate (Max 90%)
1970	30.20%	Individuals income tax rate (Max 90%)
1971	32.50%	Individuals income tax rate (Max 90%)
1972–1974	35.00%	Individuals income tax rate (Max 90%)
1975–1977	35.00%	Individuals income tax rate (Max 90%)
1978	33.80%	Individuals income tax rate (Max 90%)
1979	35.00%	Individuals income tax rate (Max 90%)
1980–1981 (June 9)	28.00%	Individuals income tax rate (Max 90%)
1981 (after June 9 )–1985	20.00%	Individuals income tax rate (Max 90%)
1985–1986	20.00%	Individuals income tax rate (Max 28-50%)
1987–1992	28.00%	Individuals income tax rate (Max 28-50%)
1993–1997 (May 6)	28.00%	Individuals income tax rate (Max 28-50%)
1997 (after May 6)–2003	20.00%	Individuals income tax rate (Max 28-50%)
2003 (after May 5)–2012	15.00%	15%
2013–2017	20.00%	15%
2018-2022	20.00%	20%

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<sup>1</sup> History of Federal Income Tax Rates: 1913 – 2021

<sup>2</sup> A brief history of dividend tax rates.

## **Distribution Theory Review**

### *Relevance Theory*

Constructed from the work of Myron Gordon and John Lintner, dividend relevance theory attempts to explain why firms distribute dividends and how a firm's dividend policy can affect its valuation. The main argument made by Gordon and Lintner is most commonly known as the Bird-in-the-Hand theory (Bhattacharya and Brown), referencing the saying, "A bird in the hand is worth two in the bush." Dividend relevance theory, or bird-in-the-hand theory, argues that the distribution of dividends decreases an investor's risk exposure and that this decrease in risk exposure increases the value of the investor's position (Gordan, 1960). Because the investor is able to immediately realize returns at the time of distribution, rather than hopefully realizing returns in an uncertain future, dividend relevance theory posits that investors will favor high-distribution stocks over low-distribution stocks and sooner-future distributions over later-future distributions. Furthermore, Gordon and Lintner state that investors hold higher required rates of returns for firms that pay lower distribution rates in order to offset the increased risk associated with the firm's high retention of earnings (Lintner, 1962).

Dividend relevance theory helped to spark conversation about firm distribution theory and optimal dividend policy. However, while the dividend relevance theory shares similarities with a few other distribution policy theories, the bird-in-the-hand theory is now generally regarded as a fallacy due to its argument that investors prefer dividends to capital gains because they are realized sooner (Bhattacharya, 1979).

### *Irrelevance Theory*

Arguably the most famous and widely supported distribution theory is the dividend irrelevance theory authored by Modigliani and Miller. Dividend irrelevance theory argues that the only factors that affect a firm's value are its earnings and riskiness (Modigliani & Miller, 1958). Unlike Gordon and Lintner's dividend relevance theory, Modigliani and Miller's dividend irrelevance theory states that a firm's distribution policy has no effect on the firm's value. Assuming the absence of both taxes and transaction costs and the presence of asymmetry of information between investors and firms, Miller and Modigliani successfully proved that the intrinsic value of an investor's position is not altered by changes to the firm's distribution policy, even after said receives distributions from a firm (Modigliani & Miller, 1958).

Additionally, under its conditions of no taxes or transaction costs, the dividend irrelevance theory is used to prove the bird-in-the-hand theory a fallacy. Without transaction costs, it is assumed that any investor can fabricate his own distribution or retention policy by liquidating shares for income or buying new shares with unwanted dividends, respectively.

### *Tax-Effect Theory*

The tax-effect theory states that investors have a preference to mitigate their tax liability and often seek out investments with distribution policies that reduce their effective tax rate (Talmor & Titman, 1990). As seen in Table 1, investment tax rates are prone to change, so according to tax-effect theory, the preferences of investors are similarly variable. While the current long-term capital gains tax rate is equal to the currently qualified dividends tax rate, these

two investment tax rates are usually different. Per tax-effect theory, it is unlikely that investors have a significant preference for any specific distribution policy today. However, should investment tax rates change, or should an investor forecast changes in investment tax rates, the tax-effect theory holds that investors will favor the distribution policy, which represents the lowest cost and highest net return.

When considering the relationship between investment tax rates and an investor's preference for a particular distribution policy, the central idea of tax-effect theory can be reframed to state that investors seek to maximize total returns whilst attempting to mitigate the amount of total return lost to investment taxes. Firms, helping to attract investor preference, play an active role in helping investors decrease this lost value, as changes to investment tax rates often lead to adjustments in firms' distribution policies (Chang & Rhee, 1990).

### *Signaling Theory*

While publicly traded firms are required to disclose substantial amounts of information to investors, perfect symmetry of information does not exist between company managers and shareholders. Furthermore, asymmetric information exists not only between managers and investors but also between different investors. Due to imperfect information, different investors contend with different perspectives on any given firm, as each investor bases their outlook on the information they possess. Additionally, the investment industry is commonly known as a highly competitive industry, where investors are in constant competition with one another. As such, signaling theory postulates that investors, recognizing their lack of perfect information within a competitive market, attempt to understand changes to a firm's dividend policy as signals that

provide additional information about said firm and its financial health (Garrett & Priestly, 2000) (Bhattacharya, 1979). For example, if a firm were to increase its dividend, subscribers of signaling theory may improve their outlook on a firm's performance or possibly anticipate an increase in earnings in future reports (DeAngelo et al., 2004). Conversely, if a firm were to decrease its dividend, the same investors would likely think more negatively of the firm's performance and expect poor earnings reports. Regarding signaling theory, the expected change in investor sentiment is especially true when a firm decreases its dividend. It is well documented that firm managers are particularly reluctant to decrease their dividends due to "significant negative market reaction to dividend cuts." (Bulan, 2010)

Empirical evidence demonstrates the existence of relationships between changes in a firm's dividend policy and market sentiment of the said firm (DeAngelo et al., 2004), which suggests that some investors do receive signals from changes in dividend policy. Overall, however, signaling theory is incomplete as it fails to isolate signals from changes in dividend policy as the driver of changes in stock prices.

### *Clientele Effect Theory*

The clientele effect is founded on the notion that certain groups of investors, or clientele, prefer certain distribution policies and seek out investment opportunities that match their respective preferences (Laws, 2019). As such, the clientele effect posits that a firm's distribution policy plays a vital role in the attraction and retention of investment from certain investor groups. Additionally, this perspective holds that a firm's desirability within certain investor groups can have a notable impact on the

market value of the firm. Recognizing a relationship between the investment of a particular clientele group and the firm's share price, a manager would have a reasonable incentive to make decisions that match the preferences of the firm's clientele group.

Research on the clientele effect presents evidence that at least some aspect of the clientele effect exists (Moser & Puckett, 2009). This evidence shows that investors tend to prefer certain investments depending on each investor's tax liabilities. A great example of a clientele group's shared preference can be seen in the high concentration of high-dividend mutual funds held in 401(K) plans (Sialm & Starks, 2012). Because many of these retirement plans are not taxed until maturity, dividends paid on assets held within 401(K) plans infrequently increase an investor's tax basis at the time of distribution.

While there is significant support for the clientele effect, its role in determining an optimal dividend policy remains nebulous. An aspect of a clientele group may exist for a given firm, which may help bolster the firm's market value, but what makes catering to that clientele group more important than catering to another clientele group? Is the favor of one clientele group superior to another? These questions remain unclear, as the preferences of clientele groups seem to be relatively mutually exclusive, yet firms still appear to target niche sectors of clientele.

### *Agency Theory*

Agency theory is rooted in the principal-agent problem, where an agent is to make decisions on behalf of a principle even though each party's best interests may not align (Mitnick,

2006). While the agent ought to act in the best interest of the principle, an obvious moral hazard develops when the best interests of the agent deviate from that of the principle. The possibility that a moral hazard may develop and result in the form of loss to the principle is known as an agency cost. In terms of dividend policy, agency theory suggests that investors have a preference for dividends in part due to the fact that increasing dividends reduces said agency costs (Easterbrook, 1984). The logic supporting this belief is that increasing dividends will decrease a firm manager's access to cash capital and thus will decrease the likelihood that said a manager would engage in poor business practices that do not align with the best interests of the firm's shareholders. Additionally, the logic holds that if a firm manager's access to cash is so low that they must raise funds externally, the firm manager is less likely to engage in poor business practices due to the risk of adverse reactions from external markets.

When combined with the aforementioned empirical evidence of managers' averseness to decreasing dividends, however, agency theory's theoretical costs seem to cut both ways. For example, if a firm manager is under pressure to either increase dividends or keep them constant, disinclination to decrease dividends may stem from reasons that are not in the best interest of the shareholders.



### **Optimal Distribution Analysis**

Used by famous investor Warren Buffet, the \$1 Test is an analysis of the value generated by one dollar invested in a company (Saber Capital, n.d.). The test highlights a company's ability to earn a return on investment greater than its Weighted Average Cost of Capital (WACC). The purpose of this examination is to determine, from the perspective of an investor, if a dollar of earnings is worth more when retained by the company or when distributed to investors. To justify the retention of capital instead of distributing it to investors, each \$1 retained should return more than investors' opportunity cost of investing that \$1 elsewhere. This opportunity cost is referred to as the Required Rate of Return (RRR), and Buffet's \$1 Test uses WACC as a proxy for RRR (Deloitte, n.d.).

The \$1 Test is performed by dividing a company's after-tax earnings by its cost of capital and comparing the result of that expression to the initial investment:

**Passed \$1 Test:  $(\text{After-Tax Earnings} / \text{WACC}) \geq \text{Initial Investment}$**

**Failed \$1 Test:  $(\text{After-Tax Earnings} / \text{WACC}) < \text{Initial investment}$**

Holding all else constant, and because the purpose of the test is to measure the marginal return of each dollar of retained capital against investors' RRR, Buffet's \$1 Test can be rewritten as the following:

**Passed \$1 Test:  $(\text{Marginal Return of Next } \$1 \text{ Retained} / \text{RRR}) \geq \$1$**

**Failed \$1 Test:  $(\text{Marginal Return of Next } \$1 \text{ Retained} / \text{RRR}) < \$1$**

Finally, it is important to make clear that while a passed \$1 Test results in the retention of that next \$1, a failed \$1 Test results in the distribution of that next \$1. Recognizing this relationship, the series of equations is made clearer in the following form:

**Retain Earnings: (Marginal Return of Next \$1 Retained / RRR)  $\geq$  \$1**

**Distribute Earnings: (Marginal Return of Next \$1 Retained / RRR)  $<$  \$1**

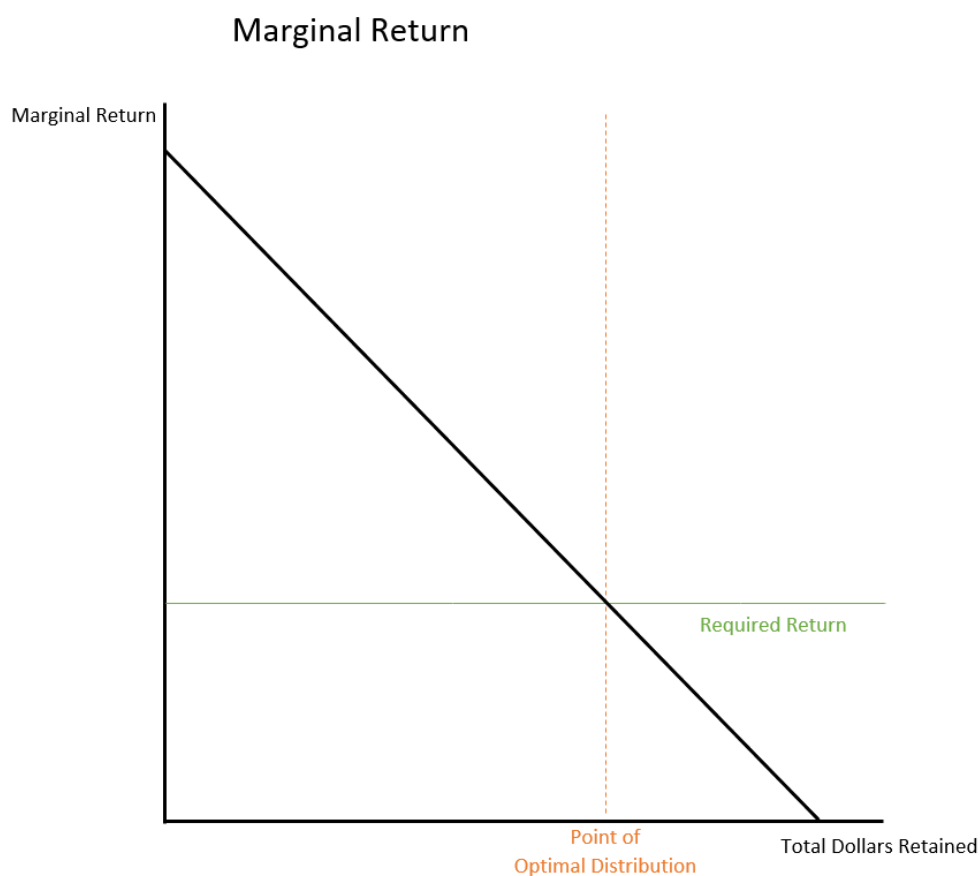
This variation of Buffet's test depicts the marginal analysis required to determine the optimal point at which earnings should be distributed rather than retained. And per the Friedman Doctrine, this simple test ought to be foundational to a firm's decision of whether to retain or distribute profits in order to maximize shareholder value.

### *Diminishing Returns*

According to famous economist Carl Menger, "A given unit, quantity, or amount of a particular good will satisfy a person's most intense need or desire. After each unit is consumed or used, a man's need or desire may be less intense. Each increment of that specific good available to him will be less valuable in his eyes." (Stolyarov, n.d.) This phenomenon is referred to in economics as the Law of Diminishing Marginal Utility.

In agreement with Menger and the Law of Diminishing Marginal Utility, this marginal analysis of the \$1 Test assumes that the marginal return on retained earnings decreases with each marginal dollar of capital retained. Furthering this analysis, Chart A illustrates the negative relationship between marginal dollars of retained earnings and marginal return on said dollars.

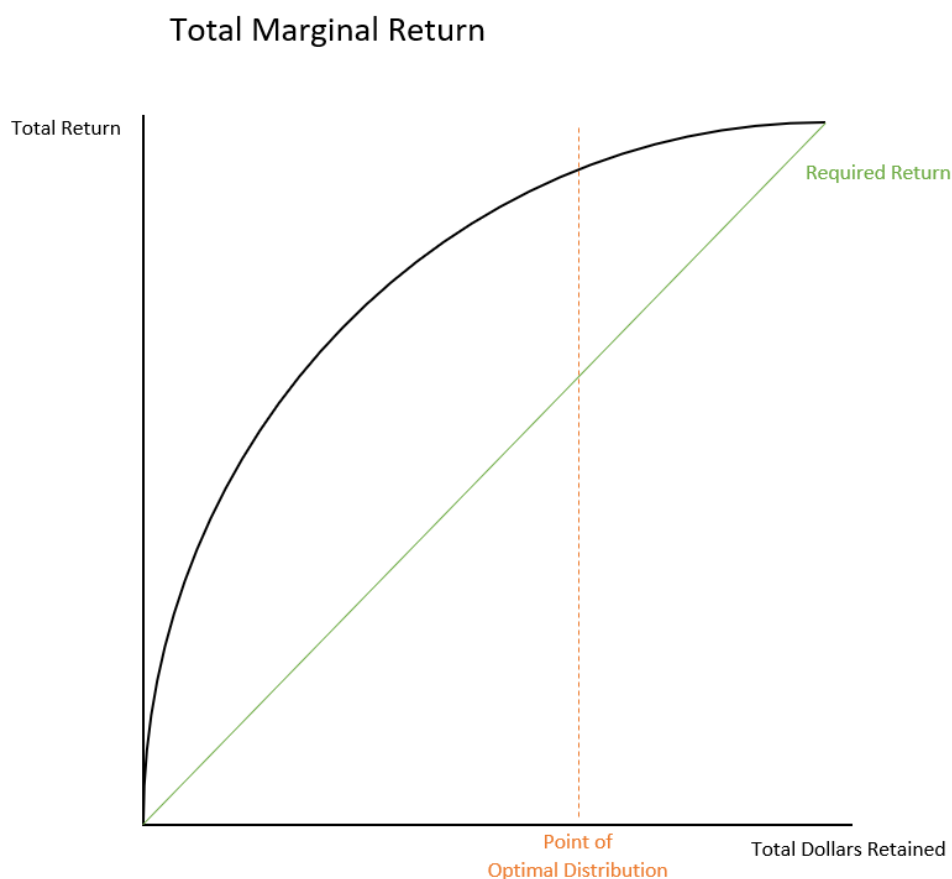
Additionally, while the Law of Diminishing Marginal Utility utilizes the Point of Saturation to signify the moment at which marginal utility equals zero, the added constraint of RRR in the \$1 Test marginal analysis represents an artificial Point of Saturation—the Point of Optimal Distribution. The Point of Optimal Distribution signifies the moment at which the marginal return of marginal dollars of retained earnings equals the RRR. All marginal dollars of retained earnings beyond this point ought to be distributed since the marginal return from their reinvestment does not surpass the RRR threshold.

*Chart A*

Adding the sum of marginal returns of marginal dollars of retained earnings depicted in Chart A, the total return of marginal dollars of retained earnings is drawn in Chart B. Holding

RRR and the Point of Optimal Distribution constant, Chart B illustrates the convexity of total returns of marginal dollars of retained earnings as marginal dollars of retained earnings increases. While Chart A explains returns on the margin, Chart B shows the maximum total return a firm could expect to achieve before distributing earnings to shareholders.

*Chart B*



### *Dividend Distribution Premium*

As mentioned earlier, firms distribute capital to investors via either dividends or share repurchases. Therefore, when considering the point of optimal distribution, additional changes must be made to the revised \$1 Test equation to specify the optimal dividend distribution point. The dividend penalty described by tax-effect theory plays an active role in the value of returns

realized by investors since investors prefer to mitigate the aforementioned lost value. However, regardless of whether tax rates are more favorable for dividends or capital gains, the difference between the current dividend tax rate and the expected capital gain manipulates the RRR investors hold for dividends. Distinguishing the timeliness between the current dividend tax rate and the expected capital gains tax rate is necessary because the dividends tax rate would be incurred immediately, whereas the capital gains tax rate is to be incurred in the future and is subject to future change.

The below series of equations introduces the variable used to represent the favorability of the current dividend tax rate versus the expected capital gains tax rate and incorporates this factor into the revised \$1 Test:

*Dividend Distribution Premium (DDP) =*

*(Current Dividend Tax Rate – Expected Capital Gains Tax Rate)*

**Retain Earnings: (Marginal Return of Next \$1 Retained / RRR)  $\geq$  (\$1 x [1-DDP])**

**Distribute Earnings: (Marginal Return of Next \$1 Retained / RRR)  $<$  (\$1 x [1-DDP])**

or

**Retain Earnings: (Marginal Return of Next \$1 Retained / (RRR x [1-DDP]))  $\geq$  \$1**

**Distribute Earnings: (Marginal Return of Next \$1 Retained / (RRR x [1-DDP]))  $<$  \$1**

Charts C and D illustrate the effect of the DDP on the revised \$1 Test. As shown by Chart C, the RRR can be increased or decreased by dividend tax benefits or dividend tax penalties, respectively. Consequently, because of this potential for increases or decreases in the RRR threshold, the DDP can have a direct impact on the optimal dividend distribution point. Consequently, if dividends are taxed at a rate that is lower than that of capital gains, the RRR is effectively increased, marginal returns reach the RRR threshold sooner, and fewer marginal dollars of retained earnings are required to reach the optimal dividend distribution point; if dividends are taxed at a rate that is higher than that of capital gains, the RRR is effectively decreased, marginal returns reach the RRR threshold later, and more marginal dollars of retained earnings are required to reach the optimal dividend distribution point.

*Chart C*

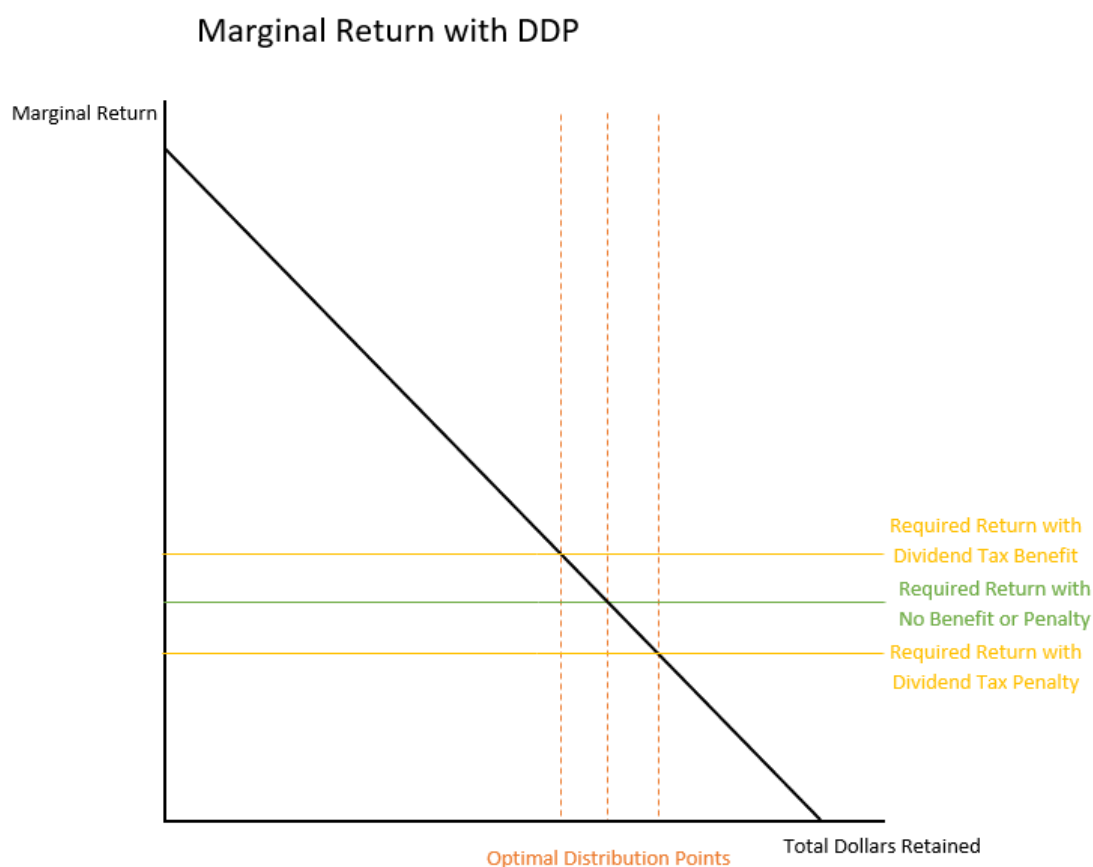
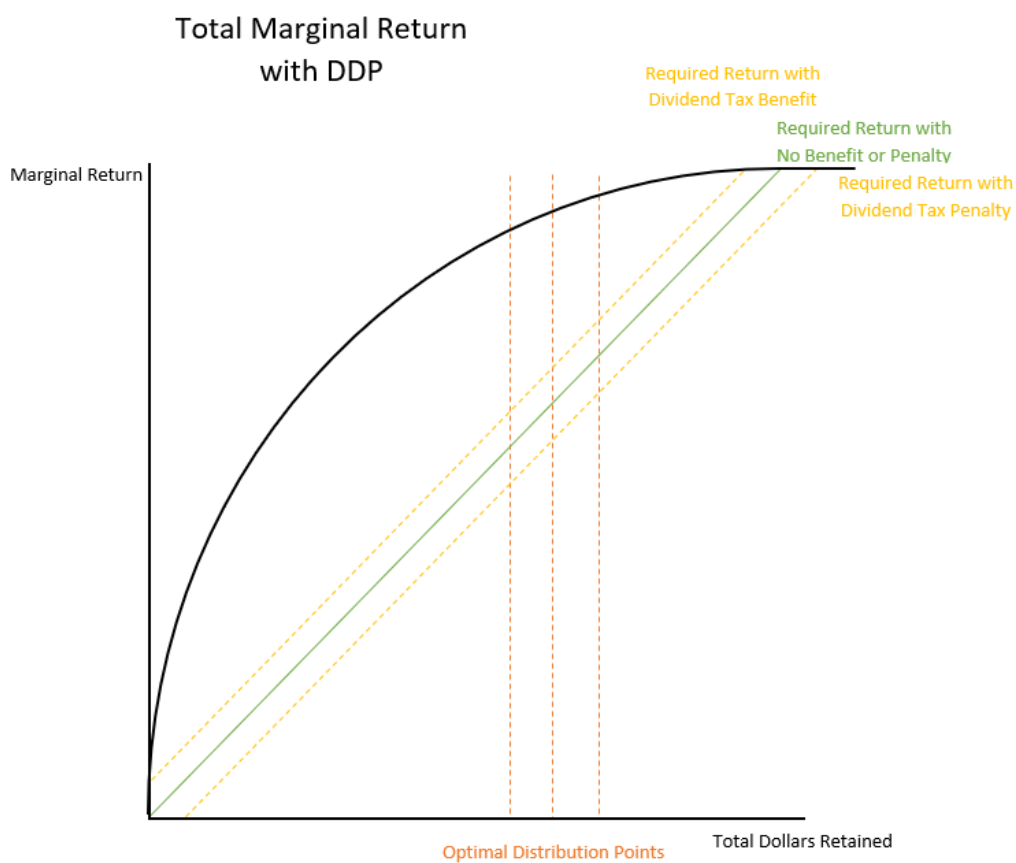


Chart D, like Chart B to Chart A, shows the sum of marginal returns of marginal dollars of retained earnings depicted in Chart C. Carrying forward the effects of the DDP to Chart D, each RRR shows potential increases or decreases to the maximum total return a firm could expect to achieve before distributing dividends to shareholders.

*Chart D*



## **Conclusion**

While the pieces of the dividend puzzle still do not fit perfectly, continued research from those studying the intersection of applied finance and theoretical economics has proven to make the pieces fit better. Attempting to operate in the same space, this paper sought to help bridge the gap between industry practice and economic theory. The sythesization of the \$1 Test and the Law of Diminishing Marginal Utility requires additional research to continue developing an optimal dividend distribution point. In the future, I hope to revisit the incorporation of the Dividend Distribution Premium (DDP) factor within the marginal analysis of the \$1 test. The DDP threshold can be further built out to include additional frictions that may result in benefits or penalties to the distribution of dividends to shareholders.



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