A CRITICAL REVIEW OF MODIGLIANI AND MILLER'S THEOREM OF CAPITAL STRUCTURE

Faruk Ahmeti ✉

FAMA University, Kosovo

farukahmeti@gmail.com

Burim Prenaj

FAMA University, Kosovo

prenajburim@gmail.com

Abstract

In their study "The cost of capital, corporation finance and the theory of investment" (1958) laureates of Nobel Price Nobel Franco Modigliani and Merton Miller represent what could possibly be the most important theory for the structure of capital, through which they explain the effect of the capital structure for the value of companies. Despite the hard work by Modigliani and Miller and the entire time spent by numerous scholars in developing concepts regarding this theory, we can say that it still remains unclear and faces many objections. This paper attempts to assess and make a critical review of Modigliani and Miller's Theory and the dominating literature that is pro and against this theory, aiming to identify the theory's importance and contribute to the field modern finances. To this end, the paper assessed and analyses Modigliani and Miller's theorem by considering the original work of authors Modigliani and Miller (1958, 1961 and 1963) as well as the dominating literature that covers this theorem, by mirroring the firmest opinions from different authors either pro or against. This paper aims to present the implications of Modigliani and Miller's Theory, its importance and theoretical contribution.

Keywords: Modigliani and Miller's Theorem, Capital's Structure, Firm Value, Debt, Leverage

INTRODUCTION

Best ways to describe the importance of Modigliani and Miller "The Cost of Capital, Corporation Finance and the Theory of Investment" (1958), is the fact that the theory of modern business finance starts with the capital structure irrelevance proposition (Eckbo, 2008, p. 140). Furthermore, the author describes their work crucial in laying down the doctrine of modern financial theory. Modigliani and Miller (1958) have tried in their paper to answer questions related to corporate finance. There were different unclear issues that M&M theorem used as their basis in building their assumption, such as, would the change of a mix of securities increase the firm's value. There were many issues taken into consideration by Modigliani and Miller, which resulted with two main assumptions. There were other assumptions added in the coming years, after M&M (1958) propositions, which have tried to complement the first assumptions.

As stated by Papescu and Visinescu (2011), many consider the M&M theory as the initial general accepted theory of capital structure; hence, before M&M theorem there were no generally an accepted theory (Luigi & Sorin, 2011, p. 315). As the basic assumption on creating their proposition, Modigliani and Miller started by assuming that there is, an exacting set of the estimated cash-flows firm has at disposal. Once the company decides to finance its assets, by selecting a certain proportion of debt and equity, the main reason of doing that is to split the cash flows between investors. Based on the assumption taken into consideration by Modigliani and Miller that access to financial markets is same for companies and investors equally, which enables for homemade advantage. According to Luigi & Sorin (2011), there are different ways that investors can benefit by getting rid of any leverage that was not wanted but was taken by the firm. Furthermore, authors pointed out that as a result, the firm's value will not be affected by the leverage of the firm.

Bose (2010) gives further explanations on Modigliani and Miller's assumptions. According to the author, Modigliani and Miller argue that in the same risk class, there is no effect on the cost of capital in the case of a mere change of debt-equity. Observations of Modigliani and Miller in their article 1958 and illustrated by Bose (2010) are:

- There is no dependence between the value of the firm and firm costs of capital to its capital structure.
- There is no dependence between the cutoff rate for investment purpose, and the form finance will carry. (Bose, 2010, p. 92)

LITERATURE REVIEW

Modigliani and Miller's Theorem

The cooperation between the university professors and Nobel Prize winners, Franco Modigliani and Merton Miller in 1958, resulted in what is today known as the first and one of the most important theories in the field of capital structure (Pagano, 2005).

By observing the original work of authors Modigliani and Miller (1958), it can be noticed that, this theory is a summary of results through which it was attempted to demonstrate the irrelevance of financial decisions, in perfect conditions of the capital market. Very soon after its publication, the M&M theory was transformed into the main theory of the capital structure (Pan, 2012). The original proposition and the fundamentals of Modigliani and Miller's Theorem (1958), suggest that there is a fully efficient market in which there are no taxes, transactions or bankruptcy costs, it also suggests that there is abundant information at the disposal of all parties. In 1963 Modigliani and Miller included also the effect of taxes on their model, so that the theory can be closer to the reality.

According to Modigliani and Miller's Publications (1958, 1961 and 1963), three important propositions, which form the base of their theorem, can be drawn (Breuer and Gürtler, 2008):

- Proposition I – A firm's total market value is independent of its capital structure.
- Proposition II – The cost of equity increases with its debt-equity ratio.
- Proposition III – A firm's total market value is independent of its dividend policy.

First Proposition– Irrelevance of the Capital Structure

According to this proposition: the capital structure of a firm does not influence its market valueM&M proposition (I) contains assumptions that under certain conditions, the firm's debt equity, ratio has no effect on the firm's market value. As described by Modigliani and Miller (1958), their approach is based on assumptions as bellow:

The Capital Market is Perfect

All capital markets where trading of securities takes place, are perfect. Furthermore, investors are free buy and sell securities, investors have the entire needed knowledge and are able to know all changes and information, there is no cost when buying and selling of securities (such as broker's commissions, the transfer fee, etc.), booth investors and firms are equal if they want to borrow against securities (Bose, 2010, p. 92).

The First Proposition without the Effect of Taxes

In their study, Modigliani and Miller take into consideration and discuss two firms with different structures of capital, one including debt in its structure of capital whereas the other one without debt in its structure of capital. Modigliani and Miller have concluded that financial decisions taken by companies have no implication on their market value, by assuming that both firms are given equal cash flow (Brigham & Ehrhardt, 2010).

In substance M&M theorize that expected cash flow is divided proportionally between company investors in compliance with the capital structure, whereas the company's value remains unaffected by this share-out (Popescu & Sorin, 2011). According to Modigliani and Miller (1958), the asset profitability and risk determine the value of the company and not the capital structure.

According to Pan (2012), the equation from M&M theory can be denoted as follows:

$$V_L = V_U$$

Where: V_L *is* the value of an unlevered firm in the capital structure, and V_U is the value of a levered firm in the capital structure. Through this equation Modigliani and Miller (1958) have argued that financial decisions have no implication on the company's market value.

The First Proposition with the Effect of Taxes

The first proposition with taxes by Modigliani and Miller holds forth that due to the exclusion of interest from the payment of taxes, firms that have more debt in the capital structure are more valuable, or have a higher market value than firms that do not have debt in their capital structure; this is known as the tax shield effect. Due to the system of taxation (which excludes the interest paid on the debt), the tax portion paid is smaller for firms with debt in the capital structure than it is for those that have no debt. This influences directly the firm's market value (Alifani & Nugroho, 2013).

According to Julio Pan (2012), the equation from M&M theory can be denoted as follows:

$$V_L = V_U + T_C D$$

Where: V_L is the value of a levered firm in the capital structure and, V_U is the value of an unlevered firm in the capital structure, $T_C D$ is the tax ratio (TC) *x* value of the debt (D).

According to Alifani and Nugroho (2013) firms find it convenient to have the debt in their capital structure due to the tax shield effect, which consequently means that they pay less tax, due to the payment of interest and this thing influences the market value of the firm.

Many authors have argued the assumption, based on which M&M presented proposition I. It is hard to say that all conditions foreseen from M&M proposition –I– are available within a single market. As stressed by Breuer & Gürtler (2008), M&M proposition –I– does not take into consideration any kind of objections resting on the imperfections of capital markets. Authors criticize the M&M proposition I also for the fact that "same risk class" assumption used when proofing propositions (Breuer & Gürtler, 2008, p. 5). In other words, would there be any perfect market? It is hard to believe, under the today's circumstances and turbulences which are characterizing today's market.

The Second proposition – Rate of Return on Equity

According to this proposition "the cost of equity increases with the increment of debt-equity ratio in the capital structure of a firm". According to Breuer &Gürtler (2008), even if all propositions are named the same from –I– to –III–, they differ significantly. The second M&M proposition, according to Villamil (2000), firm's weighted average cost of capital is not affected by its leverage. Hence, M&M proposition II specifies when the firm's debt equity ratio increases, so do the firm's cost of equity undergoes a linear increase.

The Second proposition without the effect of taxes

By way of the second proposition Modigliani and Miller (1958) argue that, since investors are rational, the expected return of equity (*Ke*) is directly proportional to the increase in gearing (*D/E*). The expected return of equity (*Ke*) is compensated by the benefit of cheaper debt finance, and, therefore the Weighted Average Cost of Capital (*WAAC*) remains unchanged (Alifani & Nugroho, 2013).

Figure 1: The Cost of Capital and Value of the Firm According to M&M Theorem (without taxes)
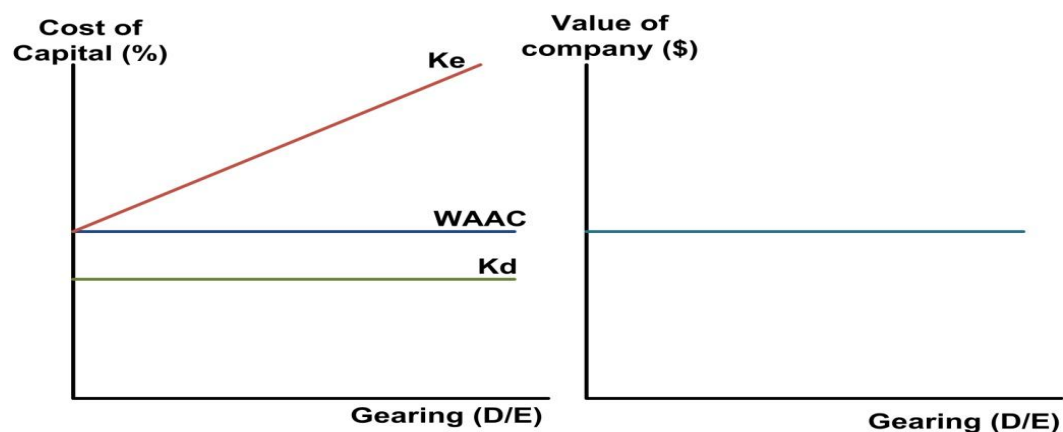
Source: Kaplan Financial Knowledge Bank, (2012)

In the above figure, it can be noted that the weighted average cost of capital (WACC) is not influenced by the capital structure, as a result, the firm's value remains unaffected by the capital structure, in the case when corporate taxes are not included in the model. So in this case, financial decisions are not important for the firm's value and shareholders' equity. In this model, the firm can use any sort mixture of capital structure, without effect in its value (Kaplan Financial Knowledge Bank, 2012).

The Second proposition with the effect of taxes

In 1963 M&M included also the effect of taxes in their work. M&M argue that the ratio of corporate tax is equal to the current value of savings from taxes. Therefore, the firm can decrease weighted the average cost of capital (WAAC) by increasing the debt percentage in the capital structure, since such companies pay less tax, due to the tax shield phenomenon (Brigham &Ehrhardt, 2010).

Figure 2: The Cost of Capital and Value of the Firm According to M&M Theorem (with taxes)
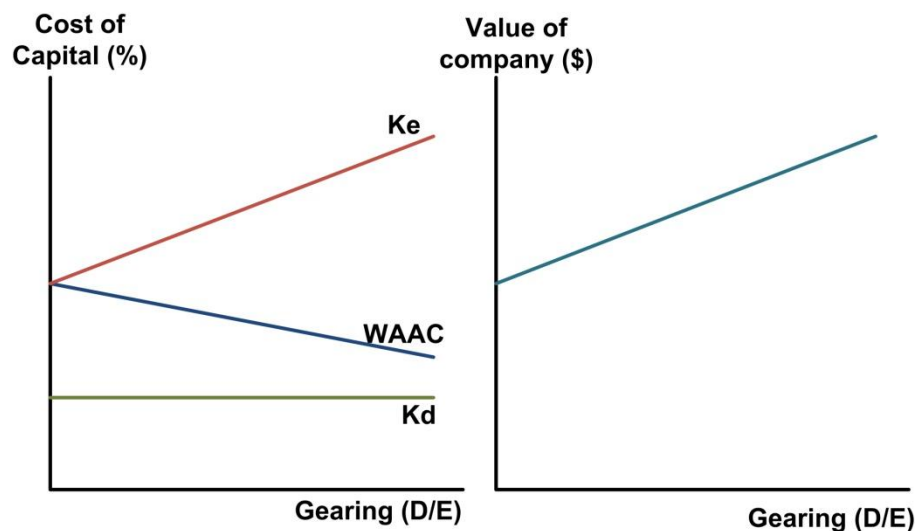
Source: Kaplan Financial Knowledge Bank, (2012)

When tax is included, firms can benefit from the increment of the debt percentage in the structure of capital due to the tax shield, as a result, the weighted average cost of capital (WAAC) will decrease, whereas the firm's value will increase (Pan, 2012).

Through proposition II, Modigliani and Miller have shown that the perception of the proposition I was wrong. Furthermore, irrelevant of the firm's debt level, it does not affect the amount that the firm's shareholders will receive from the firm. According to Breuer & Gürtler (2008), different countries or markets have different tax laws, hence, there are no identical

conditions in all markets (states or countries). The entire proposition will lose its validity if for instance a country, changes the tax regulation or law.

The Third proposition - Irrelevance of the Dividend Policy

According to this proposition: A firm's total market value is not affected by its dividend policy M&M (1961) in their study published in the Journal of Business "Dividend policy, growth and valuation of shares", state that the dividend policy is not important for the firm's value, also as described by Villamil (2000), M&M third proposition determines that there is no dependence of the firm's market value of its dividend policy. M&M (1961) argue that the market value of a firm is determined by its earning power and the risk of its underlying assets. M&M claim that in a perfect market, the value of a firm remains unaffected by its dividend policy (Miller & Modigliani, 1961).

According to M&M proposition III, Breuer & Gürtler (2008) argues that this proposition is nothing more than net present value. Furthermore, with respect to this proposition, the authors stress the fact that there is a possibility for the firm's financiers to make independent decisions regarding to the firm's investment decisions (Breuer & Gürtler, 2008, p. 5).

CONTRIBUTION AND CRITICISM ON M&M PROPOSITIONS

Modigliani and Miller have contributed a lot on financial economics. As shown by Stern & Chew (2003) most finance economists would agree that M&M propositions (such as capital structure and irrelevance propositions), are the most famous and have given a greater impact on financial economic theory development (Stern & Chew, 2003, p. 590). Furthermore, authors have tried to present the fact that; M&M contribution goes beyond the propositions themselves.

The most famous M&M proposition of the dividend irrelevance, says that corporate values are not affected by changes in dividend policies. However, as described by Stern & Chew (2003), today's markets with their dramatic development, have caroused dramatic movements in stock prices (Stern & Chew, 2003, p. 591). In addition, authors have pointed out that in the past 30 years, the reality has provided enough evidence to prove that, indeed corporate values are affected by changes in capital structure and dividend. Regardless to the fact that M&M propositions lack of analytical power, authors still evaluate the importance of M&M propositions in current finance economic theory.

There are two major contributions, which resulted from M&M and consider as fundamental, regarding to finance economics. In the framework of the modern theory of finance economics, it is one of the first use(formal) of a no-arbitrage argument it (despite the fact that

the "law of one price" is venerable) (Breuer & Gürtler, 2008, p. 5-6). Also, authors pointed out the importance, and they describe it as fundamental, the debt structure.

Modigliani and Miller (1958) and seen as fundamental by Breuer & Gürtler (2008), is the fact that, M&M theorem or propositions have structured the debate on the insignificance of unsuccessfulness about the assumptions. As such, they mentioned the following: taxes are neutral, no additional cost in the capital market (i.e., transaction costs, bankruptcy costs, etc.) investors and firms are equal and have the same access to credit markets (i.e. when borrowing at the same rate); financial information of the firm reveal no information. (Breuer & Gürtler, 2008, p. 5-6)

Except the contribution which is seen as a revolutionary form many economic experts, there are many which are skeptical, or at least don't see the M&M propositions as realistic.

As assumed by Modigliani and Miller (1958) have assumed that each company meet to a "risk class," firms with same or similar income within states across the world. However, Stiglitz (1969) proved that this assumption is not vital; hence it does not coincide with the reality (Stiglitz, 1969, p. 784). Furthermore, the author stressed several issues regarding to M&M proposition limitations. Author listed limitations are as follows:

- Risk classes are crucial and they depend on them. . . . .
- It implies objective prospect allocation over the possible outcomes, rather than subjective. . . . .
- Assumptions were based on partial equilibrium analysis, rather than general equilibrium (Stiglitz, 1969, p. 784) . . . .

Two assumptions criticized were: (i) individuals and firms can borrow at the same market rate and (ii) that bankruptcy does not exist. According to Stiglitz (1969), the practice has shown that indeed there are, or at least can appear, limitations toward the market rates for individuals when borrowing, compared to firm borrowing. Furthermore, bankruptcy is much more violent and can cause a problem to firms, much more as it was assumed by M&M proposition.

As new conditions created due to market changes, other authors have suggested new theories regarding to capital structure. (Luigi & Sorin, 2011, p. 315) Baker and Wurgler (2002) have recently suggested their theory "market timing theory of capital structure". As stressed by authors, market time means that companies issue new shares as they recognize that their shares are overestimated and ion the same time when firms repurchase their own shares as they consider these underestimated. There were also other authors that have established their assumptions and theories regarding to market timing and issuing behavior, but Baker and

Wurgler (2002) show that the capital structure is influenced by market timing (Luigi & Sorin, 201, p. 315).

As many critics were handling and dealing with M&M propositions, Modigliani and Miller have responded to those critics. While recognizing their productive criticism, Modigliani and Miller (1959), shed light on that their approach was not realized and understood completely from critics, and that it was a general concept. It was their intention to start exploring the issue (the cost of capital) that have not been investigated and studied until then; at least it was not in great detail.

CONCLUSION

Modigliani and Miller contributed in finance economics with their article "*The cost of capital, corporation finance and the theory of investment*" in 1958. As for the contribution given from them, which was also highly evaluated by many economists, Modigliani and Miller received the Nobel Prize for Economics (1985/1990). Hence, their contribution to financial theory is significant. Their propositions faces the current concepts of corporate finance and gave the opportunity for firms to see beyond the capital structure and determine the factors that in fact add value to the firm

But witnessing the results of M&M Theorem, we cannot conclude that they finally prove that the capital structure or financial decisions are entirely irrelevant to the firm's value. This was neither the aim of the study of these two authors M&M, in order to verify this, it suffices to observe their assumptions presented in their paper such as: there are no taxes, markets are perfect, there are no transactions, costs or bankruptcy cost etc. All these assumptions show that the world imagined by M&M is a controlled environment which cannot be witnessed anywhere in the world or as stressed by many authors, it seems that the real world is a bit different from the world that M&M propositions were established (Gifford, 1998). Furthermore, according to author as the M&M propositions were created in a not "exact real world", there is no wonder that these assumptions are still discussed from many economists and finance experts.

M&M assumptions were created based on non-real market conditions, but they offer the opportunity for further improvement and new theories regarding two issues stressed by those propositions. Nevertheless, beyond this, the MM Theorem is a way of thinking in terms of the finances and capital structure in particular, a way that requires a high level of intellectual discipline and analytical clarity. When studying the capital structure and ways of the firm's financing with the persuasion that "everything is irrelevant", it is possible to identify the factors that in the real world are important and relevant. Or, as Merton H. Miller stated, "Showing what doesn't matter can also show, by implication, what does?"

REFERENCES

Alifani, G. A., & Nugroho, A. B. (2013). Proving Modigliani and Miller theories of capital structure: the research on Indonesian cigarette companies. International journal of economic sciences.

Baker, M., & Wurgler, J. (2002). Market Timing and Capital Structure. The Journal of Finance , Volume 57 (Issue 1), pages 1–32.

Bhole, L. M., & Mahakud, J. (2009). Financial Institutions & Markets. New Delhi, India: Tata McGraw Hill.

Bierman, H. (2002). The capital structure decision (1 edition ed.). USA: Springer.

Bose, C. (2010). Fundamentals of Financial Management (2nd edition ed.). New Delhi, India: Asoke K. Ghosh, PHI Learning Private Limited.

Breuer, W., & Gürtler, M. (2008). 50 years after MM: recent developments in corporate finance. Jurnal of Business economics (Special Issue 6/2008 edition).

Brigham, E. F., & Ehrhardt, M. C. (2010). Financial Management: theory and practice. Cengage South Western.

Culp, C. L. (2002). The ART of Risk Management (1st edition ed.). USA: Wiley.

Gifford, D. (1998, July). After the Revolution - Forty years ago, the Modigliani-Miller propositions started a new era in corporate finance. How does M&M hold up today? Retrieved Sep 2011, from NYU-STERN (http://www.stern.nyu.edu/):
http://pages.stern.nyu.edu/~adamodar/New_Home_Page/articles/MM40yearslater.htm

Investopedia.com.   (n.d.).   Retrieved   Sep   2011,   from   Investopedia.com:
http://www.investopedia.com/terms/e/efficientfrontier.asp#axzz1XLzsxTve

Jordan, B. D., & Miller, T. (2008). Fundamentals of Investments. USA: Irwin/McGraw-Hill.

Kaplan   financial   knowledge   bank   (2012).   http://kfknowledgebank.kaplan.co.uk/.   Found   at
http://kfknowledgebank.kaplan.co.uk/KFKB/Wiki%20Pages/Theories%20of%20Gearing.aspx?mode=non
e

Luigi, P., & Sorin, V. (2011). A REVIEW OF THE CAPITAL STRUCTURE THEORIE. Retrieved Sep 2011, from IMS Academic Research Network: http://khurambukhari.files.wordpress.com/2011/02/00014.pdf

Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth and the valuation of shares. The Journal of Business , 411-433.

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance and the theory of investment. The American Economic Review, 261-296.

Modigliani, F., & Miller, M. H. (1963). Corporate income taxes and the cost of capital: a correction. The American Economic Review, 433-443.

Pagano, M. (2005). The Modigliani-Miller theorems- a cornerstone of finance. Centre for studies in economics and finance.

Pan, J. (2012). Evaluating theories of capital structure in different financial systems: an empirical analysis.Venezia: UniversitaCa'foscari.

Patton, M. Q., & Cochran, M. (2002). A guide to using qualitative research methods.Medecins sans frontiers.

Popescu, L., & Sorin, V. (2011, April 20). Retrieved from http://steconomice.uoradea.ro/. Found at http://steconomice.uoradea.ro/anale/volume/2009/v3-finances-banks-and-accountancy/53.pdf

Stern, J. M., & Chew, D. H. (2003). The revolution in corporate finance (4 edition ed.). USA: Wiley-Blackwell.

Stiglitz, J. (1969). A Re-Examination of the Modigliani-Miller Theorem. American Economic Review , vol. 59 (no. 5).

Villamil, A. P. (2000). The Modigliani-Miller Theorem. The New Palgrave Dictionary of Economics , 1-7.

Hennink, M., Hutter, I., & Bailey, A. (2010). Qualitative Research Methods. London: SAGE Publications. Holton, E., & Swanson, R. (2011). Foundations of Human Resource Development. ReadHowYouWant.com, Limited.

Taylor, G. (2005). Integrating Quantitative and Qualitative Methods in Research. Maryland: University Press of America.