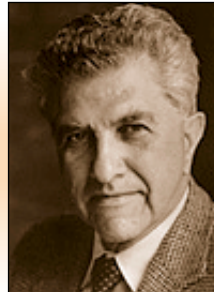




## MERTON H. MILLER

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*The theory of financial markets and corporate finance is a relatively new field of financial science. A systematic theory actually began to form back in the Fifties; though only in the following decades did its development gain momentum. Among the most famous personalities in this field is the representati-*



*ve of the Chicago School Merton H. Miller, who together with H. M. Markowitz and W. F. Sharpe received the Nobel Prize for “pioneering research in the economics field of finance and a cardinal contribution to the theory of corporation finance”.*

Merton Miller was born in Boston in the state of Massachusetts, on 16.5.1923 as an only child in a lawyer's family. He studied at Harvard University, in 1943 earning the title of baccalaureate. His classmate in the same year was the well-known economist, later also Nobel laureate – Robert M. Solow. During the war M. Miller worked as an economist at the Ministry of Finance U S A, in the Department for tax research. Later he moved to the Federal Reserve System (Department of research and statistics to the board of governors). In 1949 he decided to continue in his studies at the John Hopkins University in Baltimore, where in 1952 he gained a doctorate. In 1952 – 1953 he worked at the London School of Economics, and then his academic course in life continued at the Carnegie Institute of Technology (today the Carnegie – Mellon University), where among his colleagues were also Herbert Simon (Nobel laureate for economics, 1978) and Franco Modigliani (Nobel laureate for economics, 1985). It was here that began a fruitful

cooperation between Modigliani and Miller, which in financial theory became known as the “M&M theory”. In 1961 M. Miller moved to the Graduate School of Business at Chicago University, where he became a holder of the title R. McCormick Distinguished Service Professor. With the exception of a short break in 1966-1967, when M. Miller was guest professor at the University in Louvain in Belgium, he always worked in Chicago. In 1980 he became director of the Chicago stock exchange, the largest and most known exchange for commodity futures and the first exchange for financial futures. His research orientation brought him close to the issue of financial derivatives and questions of state regulation of financial services. Merton Miller died on 3.6.2000 following a debilitating disease. He was a foremost expert in the theory of finance and a person who used his intellectual capacity and persuasive argumentation for justifying the necessity of innovation in the field of financial markets and the harm of restrictive regulatory interventions.

### Dividend Policy

In the fifties and sixties an oft-discussed problem in economic and financial theory was the question of what the dividend policy of corporations should be and whether the level of the dividend can influence the market value of the firm. It was precisely this question which became also the foundation for the famous “M&M Theory”, where the authors Miller – Modigliani contributed to the discussion of this question in the now classic article of 1961<sup>1</sup>. Their approach became known in financial theory as proof of the “irrelevance of dividend policy” and also the capital structure of a firm generally, as far as this concerns its influence on the market value of the firm.

The “M&M” model is based on the assumption that a firm has decided what share of given expenses for investment it wants to finance through loans and the rest it wants to finance from undistributed profit. All other resources should be paid out as dividends. What happens if a firm decides to incre-

ase their dividend payment without changing the amount of loans and expenses for investment projects, as well as the return on investments? In such a case the money must be gained through an issue of further equity. Following the issuing of new equity there will be a decrease in the market price of shares and a “transfer of value” from the original shareholders to the new shareholders. The new shareholders gain shares for a lower price and the original shareholders will have a “capital loss”, since the value of their shares is decreased. This capital loss is however balanced by the payment of a higher dividend. The overall position of the original shareholders is thus unchanged and it may not matter to them one bit in which form they get their money.

The “irrelevance” of the dividends paid however applies only under certain circumstances. Primarily there must exist an efficient capital market<sup>2</sup>, so that the shareholders will have the

<sup>1</sup>Miller, M. H. – Modigliani, F.: Dividend policy, growth and the valuation of shares. Journal of Business 34 (October 1961) pages 411 – 433.

<sup>2</sup> The basic features of an efficient capital market are:  
a) prices dynamically absorb information,  
b) the market is contiguous in the sense that each following trade is realised near the price of the closely preceding price (the quicker a price absorbs information and the less the difference is in prices following itself, the more efficient the market is);

possibility to freely sell or buy shares. Accordingly abstracted are issue costs in the issue of new shares. A further limiting assumption is the fact that it is abstracted from any possible tax advantage of a dividend in comparison with the income from a capital gain (upon the sale of shares). Hitherto shareholders can gain money either by selling or part of their shares, or in the way that they persuade the management of the corporation to pay out higher dividends. The “irrelevance” of the amount of the dividend applies also in reverse. If dividends are lowered, this should be compensated by their decrease in the amount of shares in circulation – for example so that the corporation buys them back. The value of shares of those shareholders who did not sell their shares is increased by the amount by which the payment of dividends decreased.

Since investors can gain the money also in a way other than the payment of dividends, they are not willing to pay higher prices for the shares of firms, which pay out higher dividends. The dividend policy does not have an influence on the market value of a firm.

These conclusions of the “M&M theory” met criticism from two sides:

1. “Right-wing” critics highlight the fact that Modigliani and Miller ignore risk. A high dividend today is a certain income; capital income from the sale of shares is an uncertain income in the future. It is true that the future price of shares is more difficult to forecast, while the payment of dividends may be regulated by the management and stabilised. If however we work from the assumption that the overall level of debt of the firm and the yield of investments are given (and Miller and Modigliani worked from this assumption), then the overall risk which all shareholders of the firm take on, is fixed and independent of dividend policy.

Another rebuttal of the “right-wing” critics is that “M&M” do not take into consideration the information content of an increase to the dividend. Again, this rebuttal does not apply under the condition of an efficient capital market. In an efficient capital market information is dynamically reflected in share prices.

2. A further frequent rebuttal (sometimes characterised as “left-wing”, because they are expressed in a requirement for lowering dividends) concerns the tax system. If tax rates on dividends are higher than taxation of capital gain (i.e. income which shareholders gain in the sale of shares for prices higher than those at which they originally bought the shares),

c) In the market there may be realised a large volume of trade in securities without the fact that this would have a destabilising influence on prices.

In financial theory various levels of market efficiency are discerned, according to what information is reflected in prices of securities. In a so-called strong form of market efficiency, prices reflect all information that may be gained also through an analysis of the respective firm and of the whole economy.

Let us suppose whatever form of market efficiency, the prices of securities always take a random course of development and these may not be forecast. Nor is thorough analysis of the firm and the economic environment a guarantee of success. Some investors are lucky, some not so. On average their returns only cover their expenses outlaid for analysis. It was precisely this idea that was emphasised by M. Miller.

then the shareholder cannot be indifferent as to in which form they gain their income. In many countries tax rates from this aspect are neutral and also in the USA both tax rates were in 1986 essentially unified (certain disadvantages in the taxation of dividends were retained for shareholders in the highest income group). The polemic regarding issues of the influence of taxes on dividend policy continues<sup>3</sup>.

Merton Miller and several other supporters<sup>4</sup> of the theory of the “irrelevance” theory of dividend policy realise that the level of dividends that are paid by a certain corporation depends on its “clientele” (the type of shareholders and their demands for the level of dividends); this however does not have an influence on the market value of shares. If corporations were able to influence the market prices of their shares through increasing the proportion of dividends paid, they would do so. If dividends remain at the level at which they are, this bears witness to the fact that corporations do not believe that through their dividend policy they could influence the prices of their shares.

### The theory of capital structure

The concept of the “irrelevance” of dividend policy may be understood as a component of the wider theory of the “irrelevance of a firm’s capital structure”, according to which the combination of the individual sources of long-term financing (shares, preference shares, bonds, warranties etc.) cannot influence the market value of a firm<sup>5</sup>. M. Miller, known for his sense of humour, phrased it as “if you take your money out of your left pocket and put it in your right pocket, you will not be any richer”.

True, the conclusion about the irrelevance of the capital structure applies only under certain conditions – in essence the same as we mentioned in connection with dividend policy (the assumption of an efficient and perfect financial market, abstracted from the influence of taxes etc).

The basic argument of the theory of the irrelevance of the capital structure is that if individual shareholders can borrow capital under equal conditions as a corporation, they can actually eliminate the effects of any changes in the capital structure. If the firm increases the share of debt in its capital structure, so as to decrease the overall costs of capital, risk is increased and shareholders require a higher premium for the risk, i.e. a higher yield. The advantage of lower expenses for outside capital

<sup>3</sup>An overview of the various opinions and his view in respect of them is presented by M. Miller in the article: Behavioural Rationality in Finance: The Case of Dividends, *Journal of Business*, October 1986, he draws attention to, among others, the problems of measuring expected dividend yields and their relationship to the overall yield of shares.

<sup>4</sup>Among others there were for example F. Black and M. S. Scholes, well-known authors of the theory of equity price formation. For their opinion on the dividend policy, see for example, the article: The effects of dividend yield and dividend policy on common stock prices and returns, *Journal of Financial Economics* 1 (May 1974), pages 1 – 22. Incidentally, M. Scholes was one of Miller’s students.

<sup>5</sup>This component of the “M&M theory” was for the first time reasoned through in the article Modigliani, F. Miller, M. H.: The Cost of Capital, Corporation Finance and the Theory of Investment, *American Economic Review*, June 1958, pages 261 – 297.



is thereby balanced by increased expenses for equity and the balanced average of capital expenses has not changed. Neither does the market value of the firm change. If a different firm existed with the same operating profit, and with a zero share of debt in its capital structure, shareholders of the indebted firm would simply sell their shares and borrow the money themselves for the purchase of the undervalued shares of the un-indebted firm. If this mechanism is taken to the extreme, theoretically it should be possible to imagine a firm with 100% share of debt in its capital structure. Such a firm would go bankrupt; creditors would become the new shareholders, and would be satisfied with a lower yield than the original shareholders, which is absurd from the aspect of economic rationality.

From the practical aspect, the most important argument against the theory on the irrelevance of capital structure is the fact that this theory abstracts from the influence of taxes on capital expenses. Interest on debt is a deductible item, which significantly affects a firm's capital costs and its value. Into the value of a firm it is necessary to incorporate also the current value of tax savings from interest. This was recognised also by "M&M"<sup>6</sup>.

M. Miller came with a newer version of the "theory of irrelevance" to the annual meeting of the American Financial Association in 1976<sup>7</sup>. The basic idea of his argument is that it is necessary to take into consideration all taxes, not only corporation tax, but also personal income tax. At that time and the rate of tax on capital gains was substantially lower than taxation of other incomes (including income from interest). If all taxes are included into the analysis there is no reason to increase the share of debt in the capital structure. If a firm wanted to increase its share of bonds, it would have to offer higher interest to investors buying the bonds in order to compensate them for their higher tax burden. They would do so up until that time when the marginal benefit from tax savings of the corporation was balanced by the marginal expense in increasing their share of bonds. The capital expenses and value of the firm again do not change.

A tax reform in 1986, which substantially unified the tax rates on capital gains and other personal incomes, decreased the relevance of these conclusions of Miller's, though the polemic on the influence of taxes on the capital structure of firms has continued to the present. The massive use of debt in management buy-outs and the rapid expansion of junk bonds have led to a revival of discussions on these issues. According to Miller these phenomena are in accordance with the "M&M theory". If a corporation manages to increase its efficiency and to achieve high profits with the help of a high share of debt, this is a consequence of their knowing how to use the money and not the source from which the money comes<sup>8</sup>.

(Important is thus the efficiency of the use of assets, and not the combination of the individual components of liabilities).

### The significance of derivatives

The whole of Miller's work is tightly connected to the belief in the self-regulating ability of the market and the rationality of the various financial innovations created by the market. In the last years of his life Miller focused considerable attention on derivatives, (i.e. securities such as options, warranties, swaps, future contracts etc), which are derived from basic securities and play a significant role in protection against risk and which can be of help in estimating prices and for the influence of the relationship return – risk. In the second half of the eighties M. Miller characterised derivatives as an important phenomenon of the innovative ability of financial markets as an instrument which will significantly influence the development of finance in the next 20 years<sup>9</sup>. This forecast of his has been fulfilled, even when the furious development of the derivatives market in the eighties and nineties met with strong criticism among the American public.

When in 1987 the New York stock exchange crashed, many saw the cause of the problems as lying in particular in speculation on the derivatives market. The Brady Commission was established for examining the causes of this crash (named after the Minister of Finance in the Reagan administration) and M. Miller was appointed as its chairperson. This was one occasion among others where he could use his theoretical knowledge in practical economic-political recommendations.

The Commission stated many causes of the crash on the stock exchange, and among these were mentioned also speculations with financial future contracts on share indices, forex futures and institutional links of the classical capital market with the options and futures market. Miller himself entered this fray as a vehement defender of the derivatives market; he managed to persuade academic circles as well as many representatives of statutory authorities of the high utility of these financial innovations<sup>10</sup>.

In Miller's view the essential conflict between supporters of the classical capital market and the futures market did not lie in the fact that futures trades would lead to a stock-exchange crash, but the fact that Wall Street saw a dangerous competitor in the futures market, and which was taking over a part of stock-exchange trades. Therefore Wall Street was calling upon state authorities for restrictive regulatory intervention. The fact that some firms recorded losses in connection with derivatives speculation is their mistake. It is not a mistake of the derivatives themselves. In the end banks recorded much larger losses when they incorrectly estimated real estate pro-

<sup>6</sup> See Modigliani, F. – Miller, M.: Corporation Income Taxes and the Cost of Capital: Correction, American Economic Review, June 1963, pages 433 – 443.

<sup>7</sup> Miller, M.H.: Debt and Taxes, Journal of Finance, May 1977, pages 261 – 275.

<sup>8</sup> See Miller's interview for Investment Gurus, New York Institute of Finance 1997, page 3.

<sup>9</sup> Miller, M. H.: Financial Innovation: The last twenty years and the next. Journal of Financial and Quantitative Analysis, December 1986, pages 459 – 471.

<sup>10</sup> According to an article in the Chicago Tribune, 6.6.2000 it was he who "managed to create a bridge between the theoretical and real world of financial markets."



perty prices, than those connected with their overall losses from derivatives in their portfolio. The so-called derivatives revolution in Miller's view made the world a safer, enabling the reduction of risk; it did not lead to an increase in danger. According to Miller derivatives are an unusually successful and principal instrument in the management of risk, whether this is risk connected with fluctuations in securities prices, interest rates, commodity prices or forex rates. They enable risk

to be transferred from those wishing to protect themselves against it, to those willing to undertake greater risk. This solution completely conforms to the market and is a further phenomenon of its self-regulatory abilities.

Even if the work of M. Miller came about on the basis of his experiences with highly developed financial markets and market economy, his ideas still apply today, providing for many a useful lesson also for transforming economies.

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