Cost of Equity Capital: Does the Second Modigliani-Miller Theorem Apply to Swiss Banks?

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Executive Summary

In the aftermath of the financial crisis of 2008 an international discussion about micro and macro prudential regulation of the financial industry started among policy makers, regulators, bankers and economists. A central topic of this discussion has been equity capital regulation. Raised equity requirements for banks are about to be established in order to strengthen individual bank resilience against negative exogenous shocks. However, such measures are far from being overall accepted. A frequently uttered argument against raising equity requirements is the relatively higher price of equity in comparison to debt. The theoretic foundation in economics regarding the relationship between the cost of equity and capital structure was established by Franco Modigliani and Merton Miller in 1958 in their famous paper *the Cost of Capital, Corporation Finance and the Theory of Investment*. Supporters and objectors of higher equity requirements are arguing about the extent to which this theory is applicable to today's banking industry. In Switzerland this discussion is particularly lively, since the banking industry plays an important role in the country's economy.

Problem

Modigliani and Miller (1958) developed a theory stating that the cost of equity increases linearly along with financial leverage; the so-called *Modigliani-Miller Propostion II* [MM II]. The question whether this theory applies to the reality has been discussed ever since. A lot of theoretical reasons in favour of and against it have been named and various empirical studies have been conducted in order to test the theory. However, the contemporary discussion about the cost of higher equity requirements shows that this question has not been answered satisfyingly yet with respect to banks in general and to Swiss banks in particular. This thesis aims to resolve some aspects in this regard.

Method

In the first part of this thesis the question of the applicability of the MM II is examined on a theoretical level. Starting from the basic model of Modigliani and Miller (1958), the examination moves on to a detailed discussion of the scientific digestion and the further development of the model until today, always with a side glimpse to banks. Finally, it ends with a treatment of bank specific topics related to the applicability of the MM II to contemporary banks in general and Swiss banks in particular.

The second part of the thesis empirically examines whether the MM II applies to the Credit Suisse [CS] and the UBS . Due to the outstanding position of these two banks within the Swiss banking industry, restricting the focus on the CS and the UBS is justified. Additionally, the availability of much and high quality data speaks in favour of this sample selection, too. The cost of equity is represented by the beta calculated by utilizing the

CAPM. Quarterly betas are regressed on the debt-equity ratio using the OLS method. The regarded period of time starts in 1998 and ends in 2013.

Results

The first part concludes that there is a positive relationship between the cost of equity and financial leverage for Swiss banks, but to a lower extent than predicted by MM II. The reduction of the effect purported by the proposition seems to come mainly from the tax shield, implicit government guarantees, deposit insurances, and the option characteristic of equity.

The econometric examination in the second part reveals that, today, a change in financial leverage affects the cost of equity in the direction predicted by the theory of Modigliani and Miller (1958). However, this effect appears only after the financial crisis of 2008. Before the crisis, a change of the debt-equity ratio seems to have an obverse effect than purported by the MM II. An increase of financial leverage goes along with a slight decrease of beta then.

Evaluation

Combining the results from the first and the second part imposes two main findings. First, as all empirical results from this study as well as from other studies evaluated (see Junge & Kugler, 2012; Kashyap, Stein, & Hanson, 2010; Miles, Yang, & Marcheggiano, 2011) indicate that, today, there is a positive relationship between a bank's cost of equity and financial leverage, and as these results can be explained by theory, it can be assumed that the nature of that relationship is not different in average for Swiss banks.

Second, the empirical results from this study indicate that the connection between capital structure and risk has come much more to the fore in the aftermath of the financial crisis of 2008. Harking back to the theoretical studies of the first part leads to three possible explanations for this break during the crisis. First, the circumstances under which the Swiss banking industry operates could have changed during the crisis (e.g. different handling of the *too big to fail* problem). Second, investors' perception of risk could have changed and third, the average risk aversion among investors could have increased.