APPLICATION OF TH ECONOMIC VALUE ADDED MODEL ON DETERMINATION OF THE VALUE OF THE BUSINESS

VINCENT ŠOLTÉS[1], MICHAL ŠOLTÉS[2]
PROF. RNDR., CSC., DEAN FACULTY OF ECONOMICS OF THE TU OF KOŠICE – ING., DEPARTMENT OF BANKING AND INVESTMENT, FACULTY OF ECONOMICS OF THE TU OF KOŠICE

SUMMARY
The EVA index contains many important aspects of the business processes: the size and composition if the invested capital (sum of the equity capital and the loan capital on interest), the costs of the equity capital and loan capital on interest and the efficiency of the profitability of the invested capital.
In the near future the EVA index will come to the fore compared to other indexes because it describes the objective business position. It gives considerable information of the performance of the business.

INTRODUCTION

Economic value added (EVA) is relatively neew indicator, which started to be used by investors mainly in forwarded market economies. As living int he period of globalisation and in our condition also in the period of privatisation, many businesses, especially those with foreign investments (and gradually all of them), will be forced to use this indicator int he close future.
The main objective of this article is to describe EVA model and especially to analyse resources of its application on determination of the value of business.

THE CHARACTERISTICS OF EVA MODEL

As main objective of the firm is maximisation of the profit, it is logical, that also index EVA is established on this category. The difference is that it is not accounting profit, but economic. Opportunity costs are amounts of money, which were lost due to the fact that equity capital was not invested in the best alternative opportunity. Economic costs include also the equity capita, which is calculated using The Capital Assets Pricing model. Using this model we can get the relation for calculation interest rate on equity capital:

$r_e = r_f + \beta\left(r_m - r_f\right)$, in which

r_f is risk free rate, $(r_m - r_f)$ is equity risk premium and β is stock beta of the investment. Interest rate calculated using this relation is further used in calculating equity capital costs.
We will use quotation:
D is debt, E is equity, C is total invested capital (D+E), t is legal entity income tax rate, r_d interest rate for loans, WACC is weight average capital charge and NOPAT is net operating profit after taxes.

Then

$$EVA = NOPAT - C * WACC \quad (1)$$

and

$$WACC = r_d * (1-t) * \frac{D}{C} + r_e * \frac{E}{C} \quad (2)$$

The structure of indicator EVA shows, that it includes several important aspects of operational business, namely:

- the amount of invested capital and its structure (amount of equity capital and debt –), $\frac{D}{C}, \frac{E}{C}$
- costs that business pays for equity capital and debts (WACC),
- efficiency of invested capital utilisation (NOPAT).

It is evident that the higher EVA indicator is, the more effective business works. The structure of EVA shows us even the ways to improve performance of business.

Application of EVA model on determination of the value of business

One of the applications of EVA model is its utilisation for calculating the value of the firm. In general,

$$\textit{Value of enterprise}\,(VE) = c_0 + \sum_{t=1}^{\infty} \frac{EVA_t}{(1+WACC_t)^t} \quad (3)$$

I. Let's consider first regulated situation supposing that tax and interest rates as well as stock beta are constant. If total amount of capital invested is unchangeable, res. if its structure remains the same, that means

$$\frac{D+\Delta D}{C+\Delta C} = \frac{D}{C}, \qquad \frac{E+\Delta E}{C+\Delta C} = \frac{E}{C},,$$

then

$$WACC_{t+1} = r_d * (1-t) * \frac{D+\Delta D}{C+\Delta C} + r_e * \frac{E+\Delta E}{C+\Delta C} =$$

$$= r_d * (1-t) * \frac{D}{C} + r_e * \frac{E}{C} = WACC_t,$$

and that means

$WACC_t = WACC = const.$. If also $EVA_t = EVA = const.$,

then $$\sum_{t=1}^{\infty} \frac{EVA}{(1+WACC)^t}$$

is geometric series, in which

$$a_1 = \frac{EVA}{1+WACC} \text{ and } \quad q = \frac{1}{1+WACC}.$$

As $\frac{1}{1+WACC} < 1$, in this case

$$VE = C_0 + \frac{\frac{EVA}{1+WACC}}{1-\frac{1}{1+WACC}} = C_0 + \frac{EVA}{WACC} \quad (4)$$

However, this case is not too suitable for businesses in transforming countries.

II. The main stroke of these states is transforming of economies closely followed by restructuralisation of the most of businesses. For these reasons so called two-phase model seems to be more valid. It is based on the assumption that for n years (planning term) EVA_t, as well as $WACC_t$ are variable and beginning with the year (n+1) $WACC_t$ = $WACC_n$ = const. for all t = n.

If supposing, that for t = n is also $EVA_t = EVA_n$ valid, then

$$VE = C_0 + \sum_{t=1}^{n} \frac{EVA_t}{(1+WACC_t)^t} + \sum_{T=n+1}^{\infty} \frac{EVA_n}{(1+WACC_n)^t}.$$

In this situation $$\sum_{T=n+1}^{\infty} \frac{EVA_n}{(1+WACC_n)^t}$$

is geometric series, in which

$$a_1 = \frac{EVA_n}{(1+WACC_n)^{n+1}}, q = \frac{1}{1+WACC_n} \langle 1$$, and so

$$VE = C_0 + \sum_{t=1}^{n} \frac{EVA_t}{(1+WACC_t)^t} + \frac{EVA_n}{WACC * (1+WACC_n)^n} \quad (5)$$

If supposing that after n years indicator EVA will be raising in geometric way with increase rate *á*, that means $EVA_{t+1} = (1 + á) * EVA_t$ for all t = n, and then

$$VE = C_0 + \sum_{t=1}^{n} \frac{EVA_t}{(1+WACC_t)^t} + \frac{EVA_n * (1+\alpha)}{(WACC_n - \alpha) * (1+WACC_n)^n} \quad (6)$$

Note 1. This relation is valid if $q = \frac{1+\alpha}{1+WACC_n} \langle 1,$

that means , $\alpha \langle WACC_n, If \alpha \langle WACC_n$

that means rate of indicator EVA growth is higher then cost of capital ratio, then value of the firm would be infinite.
Note 2. Using listed relations the value of the whole business can be calculated. In case we need to calculate the value of own property, we have to subtract amount of debt.

CALCULATING THE VALUE OF THE FIRM USING EVA MODEL

Exercise 1. Joint-stock company Doodle, Inc. has debt in amount of 55 mil. Sk (long term loans at interest rate of 12%). Equity capital of the company consists of 134 000 shares at nominal value 1000 Sk. Legal entity income tax rate is 29%. Costs of equity capital are 15%. Every year company plans to repay the whole interest and part of debt at amount of 11 mil. Sk to have no debt in five years. At the same time it wants to raise equity capital each year at amount of 28 mil. Sk to the total sum of 274 mil Sk. Count the value of the company and market price of one share of joint-stock company Doodle, Inc.

Other information needed is in a chart:

Year	*t*	*Debt (D)*		*Equity capital (E)*		*The whole invested capital (C)*
		in mil. Sk	*percentage*	*in mil. Sk*	*percentage*	
2000	*0*	*55*	*29,101%*	*134*	*70,899%*	*189*
2001	*1*	*44*	*21,359%*	*162*	*78,641%*	*206*
2002	*2*	*33*	*14,798%*	*190*	*85,202%*	*223*
2003	*3*	*22*	*9,167%*	*218*	*90,833%*	*240*
2004	*4*	*11*	*4,280%*	*246*	*95,720%*	*257*
2005	*5*	*0*	*0%*	*274*	*100%*	*174*
2006	*6*	*0*	*0%*	*274*	*100%*	*274*

Solution:

Using listed formulas and relations we calculate partial results and write them down in a chart:

Rok	*t*	$WACC_t$	EVA_t	$EVA_t/(1+WACC_t)^t$
2000	*0*	*0,14127*	*0*	
2001	*1*	*0,14359*	*11,42*	*9,99*
2002	*2*	*0,14556*	*11,52*	*8,79*
2003	*3*	*0,14725*	*12,66*	*8,38*
2004	*4*	*0,14872*	*11,78*	*6,77*
2005	*5*	*0,15*	*11,9*	*5,92*
2006	*6*	*0,15*	*33,9*	*5,92*

Then we can calculate the value of the company:

$$VE = 189 + 9,99 + 8,79 + 8,38 + 6,77 + 5,92 + \frac{5,92}{0,15*(1+0,15)^5} = 341,21 mil.Sk$$

Value of own property = 341,21 – 55 = 281,21 mil. Sk

Market price of a share = $\frac{286,21}{134000} = 2136 Sk$

REFERENCES

[1] Kisligerová, E.: Using of the economic value added model for valuation of a company, Biatec, 11, 2000, 38-40
[2] ˇnapka, P.: K Problematice rozhodování o efektu realizace investièního podnikatel'ského zámeru, Ekonomická Revue, VˇB TU Ostravana, III, 2000, 67-74

Resümee

Der EVA Index enthält zahlreiche wichtige Aspekte der betrieblichen Prozesse – die Grösse des Anlagekapitals und seine Zusammensetzung (die Summe des Eigen- und zinsbare Fremdkapitals), die Kosten, welche das Unternehmen zahlt für das Fremd- und Eigenkapitals und die Wirkung der Utilisation des Anlagekapitals.In der nahe Zukunft wird der EVA Index in den Vordergrund treten im Vergleich mit den anderen Indexen, denn er presäntiert die objektiven geschäftlichen Situationen. Er erteilt wichtige Informationen über die Leistung des Unternehmens.

Rezümé

Az EVA mutató magába foglalja az üzleti folyamatok számos fontos aspektusát – a befektetett tőke nagyságát és összetételét (a saját tőke és a kamatozó kölcsöntőke összege), a saját tőke és a kölcsöntőke költségét és a befektetett tőke hasznosulásának hatékonyságát. A közeljövőben az EVA mutató előtérbe fog kerülni a többi indexhez képest, mert az objektív üzleti helyzetet mutatja be. Az üzlet teljesítményéről ad komoly információt.