# WEALTH ADDED FINANCIAL MANAGEMENT IN THE SERVICE SECTOR IN GREECE

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**ABSTRACT**

*Aiming to appraise the value creation capacity of the service sector firms, listed in the Athens Stock Exchange over the period 2000 – 2004, the present article uses the Economic Value Added (EVA) Model developed by Stern Stewart & Co.*

*With the exception of 2000 when 39% of the sample firms show a negative EVA, in the remaining yeas this percentage ranges from 56% in 2001 to 63% in 2003. Although the majority of the sample firms experience positive return on the capital invested (ROIC), they have high weighted average cost of capital (WACC). Three industries have positive average EVA in all five years; one has positive average EVA in three years, and another one only in two years. With the exception of the technology industry in 2004, the remaining industries in all five years have positive average ROIC, while some of these industries have also high WACC.*

**Key words**

Economic Value Added, Return on Invested Capital, Weighted Average Cost of Capital, Net Operating Profit after Taxes, Athens Stock Exchange

JEL Classification : G12; G30; G39;

## 1. Introduction

Professional financial managers hold the maximization of the firm's total value to be the objective of all decision-making. This concept is more commonly expressed as the maximization of the shareholder wealth, which is measured by the market value of the firm's stock (Damodaran 2001).

While market value of stocks widely served as acceptable measure of a firm's success in the past, and is still being used by listed firms, in the early nineties Stern Stewart & Co suggested Economic Value Added (EVA[1]) as an alternative measure of the capacity of a firm to create value.

Stern Stewart & Company have been advocating the use of EVA claiming that it has revitalized the financial performance of several U.S. companies such as Coca-Cola, CSX, SPX Corp, GE, and Chrysler (Tully 1993 and Walbert 1994). They argue that EVA drives stock prices higher, creates wealth and explains changes in shareholder wealth better than any other performance measure (Stewart, 1994).

## 2. Objectives and Methodology

The EVA Model, in its simplest form, calculates the value that a firm has created or destroyed over a certain period by subtracting from the net operating profit after tax (NOPAT) the appropriate charges that have to be made for the capital the firm has used for its operations (Stewart 1994):

$$EVA = NOPAT - \text{Capital Charges} \quad (1)$$

The EVA is in essence an estimate of the residual income that a firm creates, since it takes into account not only the NOPAT the firm produces but also the capital charges, it has incurred in order to produce these profits. Since these charges are the product of the invested capital times the weighted average cost of capital (WACC), the EVA can also be defined as (Ehrbar and Stewart 1999):

$$EVA = NOPAT - (\text{Invested Capital} \times WACC) \quad (2)$$

The NOPAT is a function of earnings before interest payments and taxes (EBIT) and the tax rate of the firm, that is (Young and O' Byrne 2000):

$$NOPAT = EBIT \times (1 - \text{Tax Rate}) \quad (3)$$

Now, if we define the return on invested capital (ROIC) as the ratio of the NOPAT over the invested capital then the EVA can be redefined as follows:

$$EVA = \text{Invested Capital} \times (ROIC - WACC) \quad (4)$$

The invested capital refers to the sum of the net operating capital and the operating long-term assets. More specifically the invested capital is calculated as follows (Brigham and Ehrhardt 2002):

[1] EVA is a registered trademark of Stern Stewart & Co

Invested Capital = (Cash + Accounts Receivable + Inventories + Operating Long Term Assets) – (Accounts Payable - Accruals) (5)

The WACC is the average cost of equity and cost of debt of a firm weighted by the proportion of equity and debt in the total capital of the firm. The cost of equity is calculated using the Capital Asset Pricing Model, taking as a risk free rate of return the yield of the ten-year Greek Government Bond and as risk premium the expected excess return investors require in order to invest money in the stock exchange (Damodaran 2002):

$$\text{Cost of Equity} = r_f + b\ (r_m - r_f) \quad (6)$$

where,

$r_f$ = Risk free return
b = Beta coefficient
$r_m$ = Market return

The before-tax cost of debt, $K_{db}$, is the average interest rate on borrowed funds that is annual interest expenses over principal. The after-tax cost of debt, $K_d$, is equal to the before-tax cost of debt times (1 – tax rate).

The difference between the ROIC and the WACC is the net return the firm achieves for the capital it uses in its operations. Companies that have a positive spread between ROIC and their WACC will have positive EVA and thus create wealth.

The objective of the present research is to investigate whether the management of the service sector firms listed in the Athens Stock Exchange over the period 2000 - 2004 produce or destroy value using the EVA Model developed by Stern Stewart & Co. The sample ranged from 175 firms in 2000 to 178 firms in 2004. Balance sheets and income statements are used to collect all the data needed to calculate EVA for each firm in every of the last five years. The industry distribution of the sample firms is shown in Table 1.

**Table 1**
**Industry Distribution of Sample Firms**

| Industry | Number of Firms | | | | |
|---|---|---|---|---|---|
| | **2000** | **2001** | **2002** | **2003** | **2004** |
| Consumer, Cyclical | 67 | 68 | 68 | 68 | 68 |
| Communication | 15 | 16 | 16 | 16 | 16 |
| Financial | 23 | 23 | 23 | 23 | 23 |
| Consumer, Non Cyclical | 51 | 51 | 51 | 51 | 51 |
| Technology | 19 | 20 | 20 | 20 | 20 |
| **Total** | **175** | **178** | **178** | **178** | **178** |

The service sector was chosen because it is the largest and most heterogeneous component of the Greek economy, comprising of a considerable variety of activities. The service sector in Greece contributes for over 70% of GDP, with the secondary sector contributing 20% to 22% of GDP and the primary sector only 8% to 10% of GDP.

For the accurate estimation of EVA, a number of adjustments had to be made to the financial statements of the firms, concerning mainly the research and development expenditures, the depreciation method used,

the leasing expenses, the valuation of inventories, and the deferred taxes (Epstein and Young 1999, Stewart 2003, and Young and O' Byrne 2000).

## 3. Findings

In the process of creating value, the first step is to ensure that the investment projects undertaken by the management of a firm can produce a positive ROIC. The results of the present research indicate that the majority of the service sector companies listed in the Athens Stock Exchange are successful in the area of producing a positive ROIC (Table 2).

**Table 2**
**Return on Invested Capital**

| | 2000 | 2001 | 2002 | 2003 | 2004 |
|---|---|---|---|---|---|
| Number of Firms | 175 | 178 | 178 | 178 | 178 |
| Positive ROIC | 161 | 154 | 142 | 145 | 146 |
| % of Positive ROIC | 92 | 87 | 80 | 81 | 82 |
| Max ROIC (%) | 108,07 | 70,81 | 89,26 | 97,14 | 150,18 |
| Min ROIC (%) | -33,25 | -74,81 | -194,66 | -251,02 | -489,49 |
| Spread Max-Min (%) | 141,32 | 145,61 | 283,93 | 348,16 | 639,67 |

The proportion of sample firms that exhibited a positive ROIC is quite impressive, ranging from 80% in 2002 to 92% in 2000. From 2000 to 2002 the proportion of firms with a positive ROIC was declining, showing the effects of the recession in the economies globally during the period, while from 2002 to 2004 this percentage was rising. The maximum ROIC ranges from 70.81% in 2001 to 150.18% in 2004, while the minimum ROIC from -489.49% in 2004 to -33.25% in 2000. Over the last five years the spread between maximum and minimum ROIC has risen from 141.32% to 639.67%, showing a growing variability of ROIC.

**Table 3**
**Distribution of ROIC**

| ROIC (%) | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No | (%) | No | (%) | No | (%) | No | (%) | No | (%) |
| -0 | 14 | 8 | 24 | 13 | 36 | 20 | 33 | 19 | 32 | 18 |
| 0-5 | 28 | 16 | 51 | 29 | 57 | 32 | 59 | 33 | 58 | 33 |
| 5.1-10 | 52 | 30 | 55 | 31 | 39 | 22 | 45 | 25 | 48 | 27 |
| 10.1-20 | 55 | 31 | 33 | 19 | 34 | 19 | 31 | 17 | 31 | 17 |
| 20.1-30 | 17 | 10 | 9 | 5 | 8 | 4 | 6 | 3 | 5 | 3 |
| 30.1- | 9 | 5 | 6 | 3 | 4 | 2 | 4 | 3 | 4 | 2 |
| **Total** | **175** | **100** | **178** | **100** | **178** | **100** | **178** | **100** | **178** | **100** |

An investigation of the results in more depth reveals that the financial performance of the sample firms is not as impressive as it appears at first sight. First, the majority of the sample firms (around 73%) have a ROIC between 0% and 10%, with the exception of year 2000 when only 54% of the sample firms have a ROIC between 0% and 10%. Secondly, the percentage of sample firms with ROIC greater than 10% ranges from only 22% to 46% (Table 3). This indicates that although the sample firms are in a position to produce positive ROIC from their operations, this might prove inadequate in the process of creating wealth. Finally the simple average ROIC shows a decreasing trend over the research period (12.07%, 7.83%, 3.10%, 4.03% and 1.82%).

The simple average WACC ranges from a low value of 7.19% in 2003 to a high value of 7.61% in 2000, showing a very low dispersion over the five years. Furthermore, in all five years over 63% of the sample firms have a WACC between 6% and 9% (Table 4). Thus, in most cases, for a firm to be in a position to have a positive EVA and produce wealth for its shareholders it must have ROIC over 7.5%.

**Table 4**
**Distribution of WACC**

| WACC (%) | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No | (%) | No | (%) | No | (%) | No | (%) | No | (%) |
| - 6 | 28 | 16 | 35 | 20 | 36 | 20 | 42 | 24 | 38 | 21 |
| 6.1-7 | 40 | 22 | 43 | 24 | 49 | 28 | 48 | 27 | 44 | 25 |
| 7.1-8 | 47 | 26 | 42 | 24 | 43 | 24 | 41 | 23 | 40 | 22 |
| 8.1-9 | 30 | 17 | 29 | 16 | 24 | 13 | 23 | 13 | 35 | 20 |
| 9.1-10 | 21 | 12 | 15 | 8 | 17 | 10 | 15 | 8 | 9 | 5 |
| 10.1-11 | 7 | 4 | 9 | 5 | 6 | 3 | 6 | 3 | 8 | 4 |
| 11.1-12 | 3 | 2 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | 1 |
| 12.1- | 2 | 1 | 4 | 2 | 3 | 2 | 2 | 1 | 3 | 2 |
| **Total** | **178** | **100** | **178** | **100** | **178** | **100** | **178** | **100** | **178** | **100** |

The probability for a firm to produce a positive EVA depends to a large extent upon the ROIC of the firm. For service sector companies listed in the Athens Stock Exchange that have a ROIC greater than 7.5% there is at least a 95% probability of producing positive EVA, in all five years.

The economic spread (the spread between the ROIC and its WACC) determines the ability of a firm to create value, under the EVA criterion. The positive spread ranges from 37% in 2003 to 61% in 2000 (Table 5). Furthermore, the simple average economic spread is positive, 4.49%, only in year 2000.

**Table 5**
**Economic Spread Distribution**

| Spread Range (%) | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No | (%) | No | (%) | No | (%) | No | (%) | No | (%) |
| - 0 | 68 | 39 | 99 | 56 | 104 | 58 | 113 | 63 | 108 | 61 |
| 0 - 5 | 43 | 25 | 43 | 0 | 44 | 25 | 35 | 20 | 36 | 20 |
| 5.1 - 10 | 29 | 17 | 16 | 0 | 16 | 9 | 15 | 8 | 23 | 13 |
| 10.1 - 15 | 14 | 8 | 7 | 0 | 5 | 3 | 5 | 3 | 6 | 3 |
| 15.1 - 20 | 10 | 6 | 6 | 0 | 4 | 2 | 5 | 3 | 0 | 0 |
| 20.1 - | 11 | 6 | 7 | 0 | 5 | 3 | 5 | 3 | 5 | 3 |
| **Total** | **175** | **100** | **178** | **56** | **178** | **100** | **178** | **100** | **178** | **100** |

The situation in the area of value creation for the service sector firms listed in the Athens Stock Exchange is not encouraging. With the exception of 2000 when 39% of the sample firms show a negative EVA, in the remaining years this percentage ranges from 56% in 2001 to 63% in 2003 (Table 6).

**Table 6**
**Economic Value Added**

| EVA Range* | 2000 | | 2001 | | 2002 | | 2003 | | 2004 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | No | (%) | No | (%) | No | (%) | No | (%) | No | (%) |
| -0 | 68 | 39 | 99 | 56 | 104 | 58 | 113 | 63 | 108 | 61 |
| 0-1 | 44 | 25 | 35 | 20 | 28 | 16 | 23 | 13 | 22 | 12 |
| 1.1-3 | 23 | 13 | 21 | 12 | 19 | 11 | 17 | 10 | 17 | 10 |
| 3.1-10 | 19 | 11 | 10 | 6 | 15 | 8 | 9 | 5 | 15 | 8 |
| 10.1-15 | 4 | 2 | 1 | 1 | 1 | 1 | 4 | 2 | 6 | 3 |
| 15.1- | 17 | 10 | 12 | 7 | 11 | 6 | 12 | 7 | 10 | 6 |
| **Total** | **175** | **100** | **178** | **100** | **178** | **100** | **178** | **100** | **178** | **100** |

*in millions of Euros

All industries in all five years have positive but declining average ROIC with the exception of the technology industry in 2004. Three industries have positive average EVA in all five years; one has positive average EVA in three years, and another one only in two years (Table 7).

**Table 7**
**Industry ROIC and EVA***

| Industry | 2000 | 2001 | 2002 | 2003 | 2004 | GAGR** |
|---|---|---|---|---|---|---|
| **Consumer, Cyclical** | | | | | | |
| ROIC | 14.5 % | 8.7 % | 7.2 % | 10.5 % | 11.3 % | -6.04% |
| EVA | 344,429 | 80,703 | 12,094 | 194,506 | 229,864 | |
| **Communication** | | | | | | |
| ROIC | 15.0 % | 13.4 % | 12.4 % | 10.9 % | 9.2 % | -9.31% |
| EVA | 585,919 | 598,604 | 580,237 | 494,558 | 334,956 | |
| **Financial** | | | | | | |
| ROIC | 17.4 % | 10.7 % | 4.9 % | 9.5 % | 7.9 % | -17.91% |
| EVA | 1,143,701 | 340,046 | -365,501 | 182,973 | -17.187 | |
| **Consumer, Non Cyclical** | | | | | | |
| ROIC | 7.9 % | 6.9 % | 7.6 % | 7.6 % | 7.8 % | -0.32% |
| EVA | 87,861 | 66,269 | 128,444 | 158,165 | 163,144 | |
| **Technology** | | | | | | |
| ROIC | 15.5 % | 12.9 % | 4.7 % | 1.9 % | -4.9 % | N/A |
| EVA | 58,534 | 59,791 | -25,654 | -56,599 | -139,213 | |

* In thousands of Euros
**Geometric average growth rate

The industry that has the largest ROIC in four out of the five years is the communication industry. This is due to the fact that the majority of the communication firms are mobile phone operators, which during the research period experienced high rates of growth because of the low penetration of mobile telephony that existed in Greece up to 2000. However, the EVA of the communication sector showed a declining trend that can be attributed to the liberalization of the fixed line telephony services that took place and the negative impact that this had on the profitability of the state owned firm (OTE S.A.) that dominates the industry.

## 4. Concluding Remarks

Accepting wealth maximization as the main objective of a firm one has to decide upon the measure that management has to use to appraise the wealth creation ability of the firm. The present research uses the Economic Value Added, as Stern Stewart & Co has developed it, in examining the value creation capacity of the service sector Greek listed firms over the years 2000 - 2004.

The findings indicate that the majority of the sample companies are successful in the area of producing a positive ROIC. However, although the sample firms are in a position to produce positive ROIC from their operations, this might prove inadequate in the process of creating wealth. The simple average ROIC shows a decreasing trend over the research period (12.07%, 7.83%, 3.10%, 4.03% and 1.82%).

In all five years over 63% of the sample firms have a WACC between 6% and 9%. Thus, in most cases, for a firm to be in a position to have a positive EVA and produce wealth for its shareholders it must have ROIC over 7.5%.

Turning to the economic spread it should be noted that the positive economic spread ranges from 37% in 2003 to 61% in 2000. The simple average economic spread is positive, 4.49%, only in year 2000.

The situation in the area of value creation for the service sector firms listed in the Athens Stock Exchange is not encouraging. With the exception of 2000 when 39% of the sample firms show a negative EVA, in the remaining yeas this percentage ranges from 56% in 2001 to 63% in 2003 (Table 6).

All industries in all five years have positive but declining average ROIC with the exception of the technology industry in 2004. Three industries have positive average EVA in all five years; one has positive average EVA in three years, and another one only in two years.

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# Analysis of the application of the Black-Scholes model on the FTSE/ASE-20 stock options of the Athens Derivatives Exchange.

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**Abstract**
*Different models of pricing stock options are tested systematically. The most useful is Black- Scholes model. Using this model to price the behavior of stock options, it is found that pricing errors and implied volatility estimates differ across exercise price and time to maturity. FTSE/ASE-20 were first introduced in August 2000 and nowadays they represent the 91,3% of the Greek options' market. This paper examines the pricing of FTSE/ASE-20 stock options using the Black- Scholes model. It is found that observed prices and predicted prices by the model differ systematically because the model assumes the market to be frictionless. The model overprices both call and put options. Furthermore, implied volatility reduces as contracts become out-of-the-money.*

Keywords: Options Market, Stock Options, Black- Scholes Model, Implied Volatility, FTSE/ASE-20, Greece.

## Introduction

Over the last 30 years, there has been enormous growth on the use of derivatives instruments and in particular, the use of options contracts. These contracts appear to be valuable for investment management (Neuberger and Hodges, 2002). Investing on options hedge the positions taken in the underlying asset but also make profits in the options market when such opportunities arise (Dritsakis and Grose, 2003). Moreover, they are ideal for hedging future volatility while they are also efficient for gaining lower transaction costs. The ideal strategy is applied according to the future volatility of the security underlying the option. Higher (lower) future volatility guides to higher (lower) option price as well. A successful investor must follow a buying (selling) strategy respectively.

Black was the first author to deal with the valuation of options. A newer and more supplemented model was the Black- Scholes option pricing model. This model assumes that the stock price follows geometric Brownian motion with a constant volatility and the market is frictionless (no transaction costs or differential taxes) (Henderson, 2004). Most of the practitioners use this model because of its simplicity, but numerous studies have proved BS model presents several biases across moneyness and maturity (Xu, 2005). A BS version that eliminates the biases, is the appliance of the implied volatility (variance of the strike price).

The purpose of this paper is to examine the pricing behavior of FTSE-20 options using the BS model. The research areas are the prediction errors, (the difference between the expected price and the observed price), the classification according to their moneyness (the

difference between the underlying asset's price and the exercise price) and their implied volatility. In order to highlight these issues, this paper is divided into the following sections. The first part is the introduction to the topic which is followed by the indication of the corresponding background. Thirdly, the data description is mentioned and fourthly the methodology followed. The empirical results are placed in the fifth section and the final section is the report of the conclusions.

## Literature Review

Using the market prices to estimate the implied volatilities, the implied values tend to vary across different option series (Duque and Lopes, 2000). Usually, at-the-money options tend to present lower values than in-the-money or out-of-the-money options. Several researches (Macbeth and Merville, 1979 cited by Duque and Lopes, 2000) proved that comparing market warrant prices to theoretical prices resulting bias on option prices. Additionally, Rubinstein, 1985 cited by Duque and Lopes, 2000 produced totally different results for different periods.

Twite (1996), examined the pricing of futures options on share price index (SPI) in the Sydney Futures Exchange (SFE). He took daily closing prices during the period 17 June 1985 till 30 December 1992. Using the Black- Scholes model he tried to price the options and compare the observed prices with the predicted. He concluded that predicted prices differ from the observed prices and tend to overprice in-the-money, underprice at-the-money options and overprice (underprice) out-of-the money call (put) options. Batten and Ellis (2005), used the Black- Scholes model upon the most important currencies traded in spot against US Dollar: The Japanese Yen, the British Pound and the Swiss Franc during the period November 1983 to April 1994. They found out that at-the-money are mispriced by 23%. The results denote that small deviations from statistical independence in asset returns may cause significant economic returns or costs. Also the results underline the need for investors to study the underlying distribution returns when they use short horizon returns in order to estimate long horizon risk. Whaley (1986), studied the S&P 500 equity futures options prices for the year 1983. He found out that early exercise of American futures options causes a significant impact on pricing, under the condition option is at-the-money. He denotes that in-the-money call options are overpriced while out-of-the-money options are underpriced. Regarding puts options the reverse situation exists, that is in-the-money puts are underpriced and out-of-the-money puts are overpriced. The implied volatility is lower for call options than for put options. Dritsakis and Grose (2003, studied the performance of London's options market using the Black- Scholes model during the period January 1995 to December 1999. They found out that BS model can locate possible mispricing of options contracts and specifically over and valued options. Out-of-the-money contracts were undervalued while in-the-money and at-the-money were overvalued. Finally, implied volatility gave more reliable results than historical volatility.

## FTSE/ASE-20 Options Market

FTSE/ASE-20 options were established in August 2000. They present 91,3% of the total Greek options market (www.adex.ase.gr). Options are standardized contracts with cash settlement. Their value depends on the value of the underlying asset (FTSE/ASE-20 stock index). In order to calculate the contract size, it is essential to be multiplied with

5€. Options on FTSE/ASE-20 index mature at the close of trading on the last day of trading on the underlying asset (European style). The expiration months are the three nearest consecutive months and the three nearest months from March, June, September and December. The market is marked-to-market with daily margin payments, where the gain or loss (determined by changes in the option premium) is transferred between investors at the close of each day's trading.

## Data Description and Pricing Model

The period under study is from 8 August 2004 till 9 August 2006. The data are limited to this period because the Athens Derivatives Exchange (ADEX) database provides daily closing prices of options only for this period. In testing the pricing of options, it is essential to require synchronous observations of both options' and the underlying asset's prices. The sample includes 4970 call prices and 4527 put prices. In general, the predicted price is much higher than the observed price for all kind of contracts. That means that the model overprices both call and put options.

Options contracts are the most difficult to price because each contract has 11 closing prices for calls and 11 closing prices for puts. The Black-Scholes model made things easier because by using its formula, analysts can easily price options. The methodology used is based on Twite (1996), who tried to price future options in Sydney Futures Exchange. Options with daily style margin payments. It is assumed that market is frictionless (no transaction costs or taxes). The Black- Scholes formula is used, which is given by:

$$c(F, X, t, T) = F(t, T)\, N(d_1) - XN(d_2) \quad (1)$$

$$p(F, X, t, T) = XN(-d_2) - F(t, T)\, N(-d_1), \quad (2)$$

where: $d_1 = \mathrm{Ln}\,[F(t, T) / X] + (\sigma_F^2 / 2)(T - t) / \sigma_F \sqrt{(T - t)}$

$d_2 = d_1 - \sigma_F \sqrt{(T - t)}$

$c(F, X, t, T)$ the price at time t for a call option that matures at time T

$p(F, X, t, T)$ the price at time t for a put option that matures at time T

$F(T, t)$ the price at time t of the underlying asset

X the exercise price

$\sigma_F$ the volatility of the daily rate of return on the underlying asset,

which is assumed constant over the life of the option contract.

For each option contract the predicted price is estimated from equation 1 for call options and from equation 2 for put options, using the historic volatility to estimate the standard deviation. The observed option price is compared with the predicted price for each day. The difference between the observed option price and the predicted price produces the prediction error. Calls and puts are grouped according to whether they are in-the-money, at-the-money or out-of-the-money. Then follows the classification according to their moneyness(the difference between the underlying asset's price and the exercise price). The last step is their classification according to their moneyness and their implied volatility.

## Empirical results

### Prediction Errors

Table 1 presents the mean prediction error to be -21,143 for call options while the mean prediction error is -13,8712 for put options. The results infer that across all call and put options, the predicted price is much higher than the observed option price. This means that the model overprices both call and put options. However, it does not mean that FTSE-20 options are going to follow the instruction of the model, as this model is assumed to be frictionless.

**Table 1: Pricing of FTSE-20 Options**
**Prediction Errors**

| | Number of Observations | Prediction Error (€) | | | | |
|---|---|---|---|---|---|---|
| | | Mean | Median | Maximum | Minimum | Range |
| **Call Options** | | | | | | |
| All | 4969 | -21,143 | -13,13 | 1707,94 | -1716,3 | 3424,22 |
| F>X | 2198 | -400,969 | -391,509 | 99,151 | -823,961 | 923,112 |
| F<X | 2771 | -295,307 | -316,616 | 113,531 | -586,511 | 700,042 |
| **Put Options** | | | | | | |
| All | 4527 | -13,8712 | -19,26 | 1239,88 | -660,31 | 1900,19 |
| F>X | 1829 | -274,598 | -303,765 | 1282,734 | -792,111 | 2074,845 |
| F<X | 2698 | -460,330 | -460,930 | 234,319 | -942,677 | 1176,997 |

The structure of prediction error is examined also by classifying the euro prediction error according to their moneyness (the difference between the FTSE-20 price and the exercise price) and to days to maturity. Moneyness is given by:

$$F(t, T) - X / X.$$

In table 2 the results show that the model tends to underprice in-the-money contracts while it overprices out-of-the-money contracts call options. Based on these results, the rank correlation between predition error and moneyness is -0,091 and -0,312 for in-the-money and out-of-the-money contracts respectively. According to the time horizon, the model tends to overprice long term contracts and either overprice or underprice short term contracts. For put options the model tends to overprice in-the-money contacts and underprices out-of-the-money contracts. The rank correlation between the prediction error and moneyness is -0,697 and -0,244 for in-the-money and out-of-the-money contracts respectively. Regarding the period of time, the model underprices all the contracts except from the middle term contracts (6-10 days).

**Table 2: Pricing of FTSE-20 Options**
**€ Prediction Errors**

| Moneyness (%) | | Days to Maturity | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Low | Up | All | <5 | 6-10 | 11-15 | 16-20 | 21-25 | 26-30 | >30 |
| **Call Options** | | | | | | | | | |
| 31 | ∞ | -618,29 | 81,025 | -15,3609 | -93,862 | -142,777 | -172,312 | -265,736 | -199,064 |
| 26 | 30 | -307,53 | 18,193 | -------- | -182,464 | -205,571 | 22,33333 | ------- | -299,656 |
| 21 | 25 | -269,25 | 1,714 | -136,05 | -188,738 | -252,008 | --------- | ------- | -294,462 |
| 16 | 20 | -230,91 | -21,806 | -139,374 | -294,266 | -235,985 | -314,21 | -363,087 | ------- |
| 11 | 15 | -180,73 | -57,283 | -237,811 | -282,286 | -302,116 | -418,207 | -367,217 | ------- |
| 6 | 10 | -123,71 | -95,280 | -279,965 | -346,62 | -415,904 | -486,392 | -457,921 | -578,447 |
| 1 | 5 | -44,257 | -139,60 | -312,141 | -391,032 | -444,712 | -511,657 | -553,819 | -587,068 |
| -5 | 0 | 44,6407 | -155,22 | -313,82 | -389,628 | -441,376 | -514,568 | -562,81 | -590,416 |
| -10 | -6 | 133,369 | -101,17 | -268,204 | -349,125 | -410,216 | 23,10968 | -567,511 | -563,362 |
| -15 | -11 | 230,393 | -104,18 | ------- | -348,798 | -351,566 | -410,053 | -571,548 | -559,627 |
| -20 | -16 | 298,464 | 11,706 | -160,576 | -------- | -------- | -403,625 | ------- | ------- |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| -30 | -21 | 491,81 | -11,92 | -158,257 | -189,058 | -------- | -288,35 | ------- | ------- |
| ∞ | -31 | 1477,18 | ------- | ------- | -202,26 | -------- | 55,15366 | ------- | ------- |
| **Put Options** | | | | | | | | | |
| 31 | ∞ | 615,832 | 550,224 | -647,658 | -------- | -------- | --------- | -------- | 884,398 |
| 26 | 30 | ------- | ------- | -------- | -------- | -------- | --------- | -------- | -------- |
| 21 | 25 | 233,02 | ------- | -------- | 368,866 | 462,996 | 533,363 | -------- | -------- |
| 16 | 20 | 287,515 | 311,683 | -336,284 | -------- | 696,767 | 867,808 | -------- | -------- |
| 11 | 15 | 200,035 | 301,955 | -419,357 | 508,404 | 596,16 | 666,035 | 652,489 | 785,963 |
| 6 | 10 | 127,678 | 243,592 | -404,107 | 485,892 | 543,512 | 611,85 | 640,102 | 678,253 |
| 1 | 5 | 46,0636 | 186,026 | -351,873 | 426,856 | 478,937 | 549,844 | 601,307 | 622,065 |
| -5 | 0 | -38,873 | 103,087 | -269,378 | 340,711 | 389,194 | 459,646 | 511,427 | 522,756 |
| -10 | -6 | -129,56 | -38,257 | -129,476 | 212,497 | 257,444 | 310,623 | 380,879 | 405,38 |
| -15 | -11 | -252,38 | -180,57 | 68,16693 | 39,9456 | -------- | 183,114 | 268,733 | -------- |
| -20 | -16 | -348,55 | -335,86 | 135,6099 | -117,49 | -------- | 35,2389 | -------- | 175,597 |
| -30 | -21 | -524,05 | -557,44 | 353,0824 | -41,526 | -123,224 | -266,526 | -------- | -------- |
| ∞ | -31 | -870,48 | -856,64 | 1060,639 | -672,476 | -765,455 | -646,029 | -------- | -------- |

Figure 3,4 plots the prediction error for call and put options by the degree of moneyness. It is obvious that mispricing exists in all levels of moneyness but the most usual interval is between -5% till 35% for calls and -20% till 15% for puts. As far as time is concerned, figure 5 mentions that mispricing is independent of time horizon, as the prediction error fluctuates between -450 till 250, even when the contract is stature or not.

**Figure 1: Call Options Prediction Error in Relation to Moneyness**

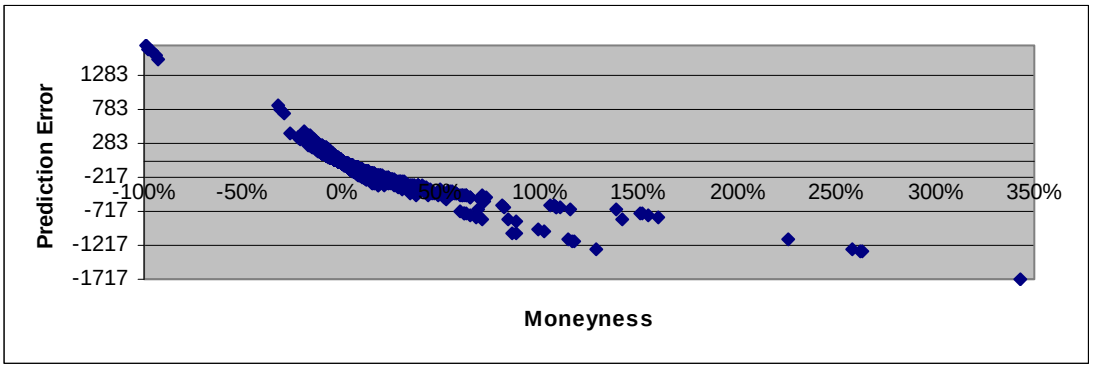



**Figure 2: Put Options Prediction Error in Relation to Moneyness**

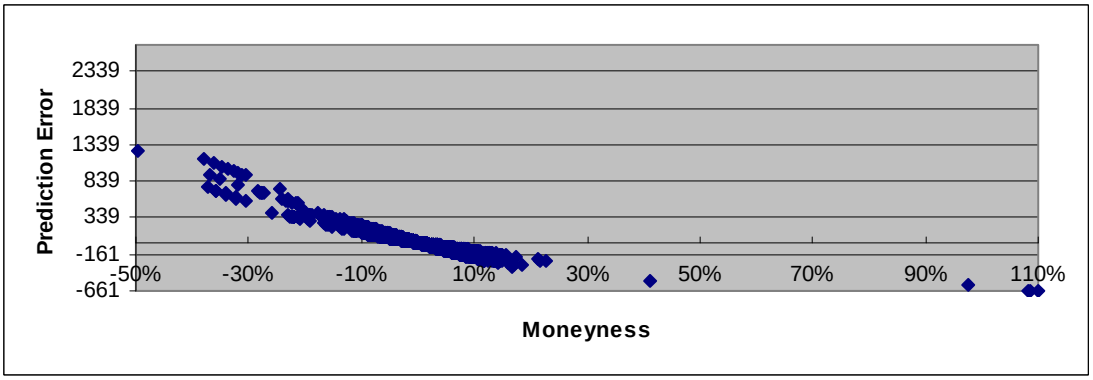



**Figure 3: Call Options Prediction Error in Relation to Days to Maturity**

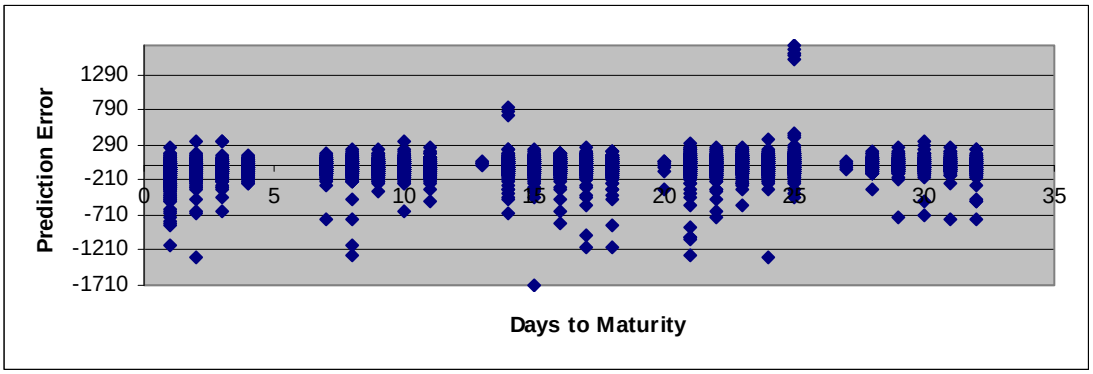
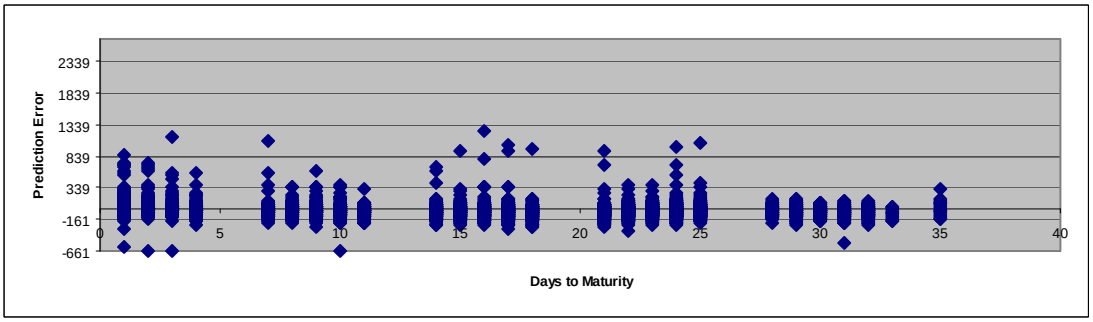



**Figure 4: Put Options Prediction Error in Relation to Days to Maturity**




## Implied Volatility

Implied volatility is different from historic volatility and it changes every day. It does not track a direction but it reflects the price of the option rather than the price of the underlying asset. In general it increases when the market moves downward and decreases when the market moves upward. It is given by:

$x_{i+1} = x_i - (y_i - p) / v_i$

where: p the option's price

$x_i$ the volatility

$y_i$ the option's theoretical value at volatility $x_i$

$v_i$ the option's vega at volatility $x_i$.

The implied volatility in this case is calculated based on equations 1,2 and in table 3 the implied volatility and its relation with moneyness and time to maturity are summarized. In general, implied volatility is high for in-the-money call options and it reduces continuously as the contracts become out-of-the-money. Regarding puts, implied volatility is high for in-the-money contracts, becomes null for at-the-money contracts, gets negative and continuously increases for out-of-the-money contracts. Call options behave the same, either they are short or long and in-the-money present high implied volatility while out-of-the-money negative. Put options present high implied volatility without exception of time period. The rank correlation between implied volatility and moneyness for calls is 0,120 and 0,722 for in-the-money and out-of-the-money respectively, while the corresponding numbers for puts are 0,703 and 0,716. All the above results are contrary with the results of Twite (1996) in Australian Stock Exchange. Specifically, Twite proved that the model undeprices options contracts and generally overprices in-the-money contracts and underprices out-of-the-money contracts.

**Table 3: Implied Volatility for FTSE-20 Options**

| Moneuness (%) | Days to Maturity |
|---|---|

| L | U | All | <5 | 6-10 | 11-15 | 16-20 | 21-25 | 26-30 | >30 |
|---|---|---|---|---|---|---|---|---|---|
| **Call Options** | | | | | | | | | |
| 31 | ∞ | 50,89% | 108,46% | 32,07% | 32,25% | 28,48% | 26,95% | 32,07% | 23,04% |
| 26 | 30 | 43,07% | 50,28% | ------- | ------- | 24,71% | 27,68% | ------ | 32,23% |
| 21 | 25 | 41,01% | 50,87% | 33,06% | 29,05% | 17,95% | ------- | ------ | 32,00% |
| 16 | 20 | 43,15% | 54,01% | 16,20% | 21,11% | 34,59% | 19,06% | 28,62% | ------- |
| 11 | 15 | 27,63% | 13,17% | 22,12% | 21,60% | 16,82% | 17,68% | ------ | ------- |
| 6 | 10 | 17,75% | 8,01% | 17,69% | 14,36% | 13,58% | 13,70% | 13,15% | 7,32% |
| 1 | 5 | 12,32% | 2,69% | 12,07% | 11,58% | 11,89% | 11,83% | 12,21% | 2,62% |
| -5 | 0 | 9,18% | -2,09% | -2,43% | 9,20% | 2,61% | 9,56% | 9,2% | -2,89% |
| -10 | -6 | 7,66% | -7,37% | -7,63% | 7,76% | 7,86% | 8,26% | 8,34% | -8,63% |
| -15 | -11 | 7,67% | 10,15% | ------- | 7,42% | 5,41% | 7,73% | 7,60% | -11,79% |
| -20 | -16 | 6,63% | 19,80% | 0,51% | ------- | ------- | 5,52% | ------ | ------- |
| -30 | -21 | 1,54% | -2,51% | 7,43% | 1,41% | ------- | 5,40% | ------ | ------- |
| ∞ | -31 | -0,69% | ------- | ------- | -13,86% | ------- | 1,95% | ------ | ------- |
| **Put Options** | | | | | | | | | |
| 31 | ∞ | 21,94% | 76,94% | 42,18% | ------- | ------- | ------- | ------ | 32,86% |
| 26 | 30 | ------- | ------- | ------- | ------- | ------- | ------- | ------ | ------- |
| 21 | 25 | 21,83% | ------- | ------- | 37,96% | 36,17% | 34,47% | ------ | ------- |
| 16 | 20 | 9,05% | 52,94% | 38,29% | ------- | 35,36% | 34,41% | ------ | ------- |
| 11 | 15 | 6,16% | 41,94% | 37,48% | 35,95% | 35,03% | 34,13% | 33,10% | 32,75% |
| 6 | 10 | 4,71% | 40,25% | 36,31% | 35,13% | 34,57% | 33,69% | 32,96% | 32,65% |
| 1 | 5 | 2,65% | 36,50% | 34,99% | 34,33% | 33,92% | 33,28% | 32,72% | 32,48% |
| -5 | 0 | -0,20% | 32,83% | 33,53% | 33,35% | 33,15% | 32,77% | 32,38% | 32,21% |
| -10 | -6 | -3,80% | 27,88% | 31,78% | 32,22% | 32,32% | 32,15% | 32,02% | 31,87% |
| -15 | -11 | -12,14% | 23,41% | 29,72% | 30,82% | ------- | 31,45% | 31,68% | ------- |
| -20 | -16 | -15,16% | 18,45% | 28,54% | 29,23% | ------- | 30,585 | ------ | 31,9% |
| -30 | -21 | -25,34% | 12,56% | 26,49% | 27,61% | 29,22% | 29,11% | ------ | ------- |
| ∞ | -31 | -48,43% | 1,61% | 19,82% | 26,50% | 25,47% | 27,97% | ------ | ------- |

## Conclusion

This paper tried to evaluate the Greek options' market using the most common used pricing model, the Black-Scholes model. This evaluation proved that the observed prices differ from the predicted prices. Specifically, the model overprices both call and put options contrary to the results presented by Twite, 1996 and Whaley, 1986. Specifically, out-of-the-money call options are overpriced while in-the-money call options are underpriced. Put options present the altogether different results. The prediction error according to the moneyness and the days to maturity, show that short term call options are either underpriced or overpriced while long term contracts are overpriced. Put options are underpriced except from the middle term contracts (6-10 days). Also the correlation between the moneyness and the prediction error proved to be negatively weak for call options and negatively strong for put options. Mispricing exists in all levels of time maturity, but the most usual intervals of mispricing exist between -5% till 35% and -20% till 15% for call options and put options respectively. Implied volatility is high for in-the-money contracts and reduces as contracts become negative. This paper proved that Black- Scholes model produce totally different results than the observed prices in the market.

## Acknowledgements

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# The Possible Ways to IFRS (International Financial Reporting Standards) for Micro-Entities Development (an Investigation of its Usefulness)

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**Abstract**

*There are many ways how to develop accounting standards compatible for SMEs, but most significant activity in this field is the research project of IASB (International Accounting Standards Board). IASB has developed IFRS. Even though IFRS are suitable for all the entities, their application in case of SMEs would be very expensive and could increase compliance costs of taxation significantly. The development has not finished yet and there has arisen some problems which need to be solved before financial reporting standards introduction to the public. The Exposure Draft IFRS for SMEs was published for public comment.*
*The research of IASB has shown that IFRS for SMEs should be used mainly by the entities which do not have public accountability – i.e. that its equities are not publicly traded and do not hold assets in a fiduciary capacity for a broad group of outsiders. The typical size of SME for which should be IFRS for SMEs developed is about 50 employees. Those standards may not be suited to the smallest entities within the SME spectrum – for micro entities. Micro entities are the smallest entities within the spectrum of small and medium entities.*
*The paper presents findings of an investigation into the users of micro entity financial reports and their information needs. The analysis of the legal status of micro entities across national jurisdictions and the nature and format of existing financial reports that these entities produce and needs of possible harmonization of their financial reporting is the key objective.*
*First, the micro entities and their significance are defined. Then the users of financial statements and their information needs are examined. In conclusion is the IASB Exposure Draft for SMEs evaluated and modified (reduced) for micro entities.*

Key words: Small and Medium-sized enterprises (SMEs), micro entity, IFRS, harmonization, corporate income tax base

## Introduction

Basing on the newest statistics, there are about 23 millions SMEs(Small and Medium Enterprises) operating in 25 EU member states. These companies are providing 66% of jobs in the EU (source Eurostat; Table 1). SMEs are considered to be the key factor of economic growth and employment in the EU. They are socially and economically important and represent 99% of all enterprises in the EU. In the last ten years, they have received a great attention in the EU. A new Recommendation 2003/361/EC regarding the SME definition was adopted in May 2003. This document categorized SMEs into three groups:

- Medium-sized enterprises with less than 250 employees and the turnover below € 50 million and/or balance below € 43 million;
- Small enterprises with more than 50 people and the turnover below € 10 million and/or balance below € 10 million;
- Micro enterprises with less than 10 employees and the turnover below € 2 million and/or balance below € 2 million.

**Table 1:** Structure of EU 25 business entities by number of persons employed

| **The share of enterprises on total EU employment** | |
|---|---|
| **Type of enterprise** | **Share on total employment** |
| Large | 34.20% |
| Medium | 17.00% |
| Small | 20.70% |
| Micro | 28.40% |

Source: Eurostat

The increase in the importance of SMEs in EU economy has forced the Commission to work on studies COM(2001)582 final and COM(2005)532 final in that area. These studies have dealt with the position of SMEs in the Internal Market and have identified the obstacles, which these types of enterprises are facing while operating in the Internal Market. As compared with large enterprises whose accounting system is harmonized by IAS/IFRS, the existence of obstacles (mainly in the form of 27 different accounting and tax systems which generate disproportional high compliance cost for SMEs) is the main reason why SMEs are less involved in the cross-border activities and that they less operate in the Internal Market (European Commission, 2003). The studies have revealed that SMEs operate mainly in the domestic market. It seems to be obvious that the

higher involvement of SMEs in cross-border activities and their increased operation in the Internal Market could improve their competitiveness and performance. This could remarkably influence the economic growth as a whole. Benefits of global accounting standards for listed companies are obvious above all in the globalized financial market.

Small or medium-sized enterprises (SME) have a legal obligation to prepare financial statements in accordance with a set of accounting principles accepted in their country. Those statements are available to creditors, suppliers, government in their country, but they could be badly understandable to creditors, suppliers and others in other countries.

Is it necessary to develop special global financial reporting standards for SMEs? The benefit of global financial reporting standards is not limited to enterprises whose securities are traded in public capital markets. Small and medium-sized enterprises – and those who use their financial statements – can benefit from a common set of accounting standards different from full IFRS:

- Users may have less interest in some information in general purpose financial statements prepared in accordance with full IFRS than users of financial statements of publicly traded entities (users of financial statements of SMEs may have greater interest in short term cash flows, liquidity, balance sheet strength and interest coverage or they may need some information that is not ordinarily presented in the financial statement of publicly traded companies.
- Differences between full IFRS and IFRS for SMEs must be determined on the basis of users´ needs and cost-benefit analyses (the benefit of applying should exceed the cost)

Financial statements of SMEs that are comparable from one country to the next are needed for following reasons:

- Financial institution make loans across borders and operate multinationally,
- Vendors want to evaluate the financial health of buzzers in other countries before they sell goods or services on credit,
- Credit rating agencies try to develop rating uniformly across borders,
- Many SMEs have overseas suppliers and use a supplier’s financial statements to assess the prospects of a viable long-term business relationship,
- Venture capital firms providing funding to SMEs across borders,

- Many SMEs have outside investors who are not involved in the day-to-day management of the entity. Global accounting standards for general purpose financial statements and the resulting comparability are especially important when those outside investors are located in a different jurisdiction from the entity and when they have interests in other SMEs
- Global standards also improve consistency in audit quality and facilitate education and training

On the other hand:

- Good accounting and more disclosure add to SME burdens, rather than reduce them
- SMEs are often concerned about the competitive harmfulness of greater transparency

The aim of the paper is concerned with the possibilities of harmonization of 27 different accounting systems used by SMEs in the EU, because the existence of 27 different accounting systems is one of the most significant obstacles in cross-border activities for SMEs. The paper is concerned with possible ways of accounting harmonization in the EU and all over the world. The great deal of attention is paid to the most probably ways of the SME accounting harmonization – the IAS/IFRS modification for SMEs and the special modification for micro entities.
There are used IFRS as a starting point for their possible modification (simplification of standards or omitting standards) in the case of SMEs in this paper. And the Exposure Draft IFRS for SMEs is a starting point for modification for micro entities, because all proposed IFRS for SMEs may not be suited to the smallest entities in the SME spectrum.

## Methodology

This paper is concerned with the identification of the legal status of micro-entities across national jurisdictions, the nature and format of financial reports prepared by these entities and the analyses of their users and information needs. The analyses of users and their needs is a starting point for harmonization need evaluation.

The approach to harmonization of financial reporting for micro-entities is divided in following steps:

1. the relevant criteria for a micro-entity are defined
2. position of micro entities in economy across the EU and the world
3. users of financial reports of micro-entities are identified

4. information needs of users are defined
5. needs for harmonization and possible ways of harmonization micro-entities financial reporting
6. possible ways to mirco-entities financial reporting harmonization

## Theoretical background

The great deal of attention was paid to the question of defining relevant criteria for small entities in the past century. The small entity was defined as an enterprise which has a "relatively" small share of the market, are managed by owners and are independent in the sense that are not a part of a large entity[2]. The quantitative criteria for small entities definition were criticized in the beginning of 21st. century. The use of more qualitative criteria or mix of both was preferred[3]. The alternative approach focused on ownership or organizational structure[4].

IASB (International Accounting Standards Board) refrained from adopting common quantitative size criteria for SME definition and focused on public accountability[5]. It would be left on individual countries to develop quantitative criteria or other measures of economic significance.

Research made by Barker and Noonan (1995) and Demartini (2005) demonstrated, that SMEs are not a homogenous group and these entities should be differentiated to groups:

- medium sized entities
- small entities
- micro- entities

Each group of SMEs category differs in many ways. There is the most significant difference in the field of regulation of financial reporting in many countries. For example many countries exempt smaller enterprises from statutory audit and subject them to differential reporting requirements. As a result of EU Code of accounting legislation, small and medium companies have to option of filling abbreviated

[2] definition of Bolton Report (1971)
[3] Paoloni (1999).
[4] Chittenden (1990)
[5] An entity has public accountability if: it has filed or, is in the process of filing, its financial statements with a security commission or other regulatory organization for the purpose of issuing any class of financial instruments in a public market, or it holds assets in a fiduciary capacity for broad group of outsiders , such as bank, an insurance company securities broker, pension fund, mutual fund or investment banking entity (IASB,2006)

reports with reduced levels of disclosure.[6] There are arguments supporting the need for differential reporting and relaxing requirements for smaller entities. Much of the disclosure information required by full financial statements intended for listed companies are not relevant to smaller businesses. Larger companies use their financial statements for a wider range of decisions and that they undertake more complex transactions than smaller enterprises, providing aggregated information that requires more sophisticated analysis.[7] The compliance cost of preparation full financial statements for smaller entities would not be appropriate (very high). Despite the fact that differential reporting is useful, owners of small entities have mixed views on the cost/benefit balance of regulation and producing such information. Recent research in the USA suggests that the benefits of preparing or using prescribed financial statements should be compared with the cost of preparing or using these statements. [8] Usefulness varies across different types of SMEs. Owners of growing small entities are much more likely to accept regulation as a means of generating interest, and therefore potential outside investment, in the company.[9]

The literature presents some cases against differential reporting for larger and smaller entities:

- the need for comparability and reliability derives from the universal application of accounting rules
- reduction in regulations for smaller entities may portray small companies as second class citizens and may even risk bifurcation within the profession[10]
- more than one set of rules may undermine the credibility of accounts in the minds of users since different rules may result in different results and, in particular, profit figures.

The arguments for differential reporting seem to be stronger. The main argument for differential reporting of smaller enterprises is based on the results of the IASB research[11].

The IASB definition of SMEs does not include quantified size criteria for SMEs determination, because those standards could be used in over 100 countries. It is not feasible to develop quantified tests that would be applicable and long-lasting in all these countries. In deciding which entities should be required or permitted to

[6] IFAC report
[7] Collis (2002)
[8] AICPA (2005)
[9] Research made by Barker and Noonan in Ireland in 1995
[10] Barker and Noonan (1995)
[11] Comment letters to Preliminary Views on IFRS for SME (2004)

use the IFRS for SMEs, jurisdiction may prescribe quantified size criteria in each particular country. Despite this fact, the IASB approach focuses on "the typical SME" with about 50 employees. It is a quantified size test for defining SME but, rather, to help it decide kind of transactions, events and conditions that should be explicitly addressed in the IFRS for SMEs. There could be any problem, because IFRS for SMEs could not be suitable for very small entities (micro entities). This kind of entities prepares financial statements especially for taxation purposes. The organization of IFRS for SME should make easy for micro SMEs to identify those aspects of standards that are relevant to them. This approach might result in relatively low costs to SMEs in preparing financial statements in accordance with IFRS for SMEs.

The effort of IASB was completed by preparation of the Exposure Draft of IFRS for SMEs for public comments in February 2007.

## The objective of the IFRS for SMEs

The aim of the proposed standard is to provide a simplified, self-contained set of standards, based on full IFRS, which were developed primarily for listed companies. There is designed to apply to the general purpose financial statements and other financial reporting for all profit-oriented entities. General purpose financial statements are directed towards the common information needs of a wide range of users (shareholders, creditors, employees and the public) and provide information about an entity's financial position, performance and cash flows. Determining taxable income requires special purpose financial statement designed to comply with the tax laws and regulations in a particular jurisdiction. An entity taxable income is defined by the laws and regulations of the country or other jurisdiction in which it is domiciled. Tax authorities are also important external users of the financial statements of SMEs. General purpose financial statements prepared in an accord with IFRS for SMEs could be a starting point for determining taxable income in the future, but usually have some policies to minimize the adjustments to accounting profit or loss for the purpose of determining taxable income.[12] Designed global accounting standards for SMEs do not deal with tax reporting in individual jurisdiction, but profit or loss determined in conformity with the proposed IFRS for SMEs could serve as a starting point for determining taxable income in a given jurisdiction by means

[12] For details see Nobes (2003)

of reconciliation that is easily developed at a national level.
It is not the primal purpose of the IFRS for SMEs to provide information to owner-managers to help then make management decisions, the more significant information source for managers is the system of management accounting, which is constructed in accord with the organizational structure of an entity. Nonetheless, general purpose financial statements will often serve managers as a source of information on business financial position, performance and cash flows.
The second possible approach to SMEs Financial reporting harmonization is the approach of UNCTAD/ISAR. It is similar to the approach of IABS. There is only one difference. The ISAR approach identifies three levels of financial reporting regulation:

- level 1: Listed entities whose securities are publicly traded and those with significant public interest should follow IFRSs
- level 2: Significant commercial, industrial and business entities that issues neither public securities nor financial report to the general public may follow IFRS for SMEs
- level 3: Is aimed to the smallest entities, the detailed definition of the smallest entities is not provided (it can vary internationally, depending on the size stage of development of countries[13]), these entities could follow a simple accrual-based accounting system, which should be consistent with the requirement of IFRSs but more simple, or cash based accounting.

## Discussion and Results

## Definition of micro-entities

Harmonization of financial reporting for large, medium-sized and small companies is already solved. There are IFRS for large publicly traded companies, IFRS for SMEs are on display for public comment. The typical entity for which were IFRS for SMEs developed is an entity with 50 employees. There is a question. Are IFRS for SMEs the best way for micro-entities financial reporting? In conformity with the Recommendation 2003/361/EC are micro-entities defined as entities with less than 10 employees and the turnover below € 2 million and/or balance below € 2 million. The importance of micro-entities varies across sectors of any economy. In EU countries in 2001, micro

[13] UNCTAD (2000)
*) there is not used special quantitative criterion for micro-entitiy

entities accounted for only 1.9% of all employment in the electricity, gas and water supply industry and 4.6% in mining and quarrying. In contrast, they accounted for 45.7% of employment in hotels and restaurants and 39.6% in distributive trades (Eurostat, 2005).

**Table 2: Size criteria used in national legislation in various EU and non EU countries for micro-entities definition (in USD)**

| | Employees | Turnover | Balance Sheet Total |
|---|---|---|---|
| Belgium | *) | *) | *) |
| Czech | 10 | 2.6 | 2.6 |
| Estonia | 10 | 0.8 | 0.4 |
| Germany | 10 | 2.6 | 2.6 |
| Hungary | 10 | 2.6 | 2.6 |
| Italy | *) | *) | *) |
| Poland | 10 | 2.6 | 2.6 |
| Romania | 10 | *) | *) |
| UK | *) | *) | *) |
| Brazil | *) | 0.1 | *) |
| China | *) | *) | *) |
| Russia | *) | *) | *) |
| Switzerland | *) | *) | *) |

Source: own research

Most accounting regulatory regimes recognize difference between larger and smaller enterprises. There are the burdens placed upon smaller enterprises by financial reporting, many countries exempt smaller entities from statutory audit and subject them to differential reporting requirements.

## Financial information and their suitability for micro-entities, users of financial information

Usefulness of financial information varies across different types of SMEs. Based on findings of Baker and Noonan (1995), the owners of growing small entities are much more likely to accept regulation as a means of generating interest, and therefore potential outside investment, in the company. Other micro-entities in a start-up situation prefer more relaxed regulatory regime. There are many micro-entities (especially in the transition economies) which do not actually keep proper financial records or accounts. The main reason is that they are not convinced of usefulness of financial information for decision making and control. For example, the smallest entities in the Czech Republic should use only the income tax act for financial recording. They keep records based on cash flows

for taxation purposes and for decision making. The accrual principle is not allowed, while Cyprus and Malta require all companies to follow full IFRS. There are accounting requirements for purposes of taxation differentiated according to the size of the entity size in Poland.

Owners-managers of micro-entities could use financial information for a variety of purposes:

- to ascertain remuneration awards made to directors
- to compare entity performance with previous periods
- for purposes associated with loans and financing
- it is a useful tool for planning and decision-making
- to compare income and costs with past periods
- taxation

One of main aims of micro-entities run by owners and their families is to minimize tax liability. They do not use the financial information as a tool to communicate with external users or for management needs (Paoloni, 2000). This contrasts with Barker and Noonan (1995) study. They comment that the major uses include: to determine gross profit, asses directors fee, tax liability and ensure that the expenses are reasonable. The tax authority seems to be a major user of financial information of micro-entities. Tax authorities have their own rules to determine taxable income across countries. That means that one set of harmonized accounting standards will not satisfy every tax authority. Taxation is not the reason to harmonize financial reporting of micro-entities yet.

Finance providers are very important users of financial information of micro-entities. Banks are the most important source of finance for micro-entities in most countries. Financial information plays significant role in their lending decisions. Micro-entities should inform banks annually for the purpose of monitoring existing loans or for the purpose of applying for new loans. Micro-entities also gain finance from other sources. It may be government agencies, regional development agencies or EU agencies. Getting finance could be very important reason for financial reporting harmonization of micro-entities. Financial information should be understandable not only in the home country, but to creditors in other countries, because these entities can get finance (from bank or grants) in the home country or in other countries.

## Possible ways to micro-entities financial reporting harmonization

There are three ways to micro-entities financial reporting harmonization:

1. financial reporting based on the cash-flow bases
2. financial reporting based on the accrual concept
3. financial reporting based on IFRS for SMEs

### *Financial reporting based on the cash-flow bases*

This is a very simple and not demanding extra costs way to record economic activity of an entity. The main objective of a micro-entity´s activity is its capacity to generate positive cash flow. The positive cash flow is a starting point for taxable income generating and repaying loans ability estimating.
This approach is limited in its function to serve information for management, planning, decision making.

### *Financial reporting based on the accrual concept*

The most convenient approach to micro-entities financial reporting is to simplify the IFRS for SMEs for micro-entities. IFRS designed for large publicly traded companies were simplified for SMEs (see Table 3). IFRS for SMEs were designed for typical SME with 50 employees. Many articles of IFRS for SMEs could be omitted for micro-entities, many articles could be simplified for micro-entities. In a micro-entity´s activity is many regularly recurrent operations and only a few irregular operations, financial statements tent to be prepared by owner-managers themselves or externally by a hired accountant. This is the main reason for simplification of IFRS for SMEs for micro-entities.

The simplification could be based:

- On omitting some accounting principles arising from the Conceptual Framework, it is especially prudence principle (micro-entities should not record provisions and adjustments
- Reduction of financial statements amount and simplification of theirs content (only a balance sheet and an income statement)
- The most significant valuation base should be historical cost (for inventories, property, plants and equipments)
- All kind of lease could be recorded as an operating lease
- Construction contracts could be recorded on the invoice bases (IAS 11 omitting)
- Only the current income tax recording.

**Table 3: Survey of possible modification of each IFRS for SME**

| Standard | Name | Simplification | Omitting |
|---|---|---|---|
| IAS 1 | Presentation of Financial Statements | + | |
| IAS 2 | Inventories | | |
| IAS 7 | Cash Flow Statement | + | |
| IAS 8 | Accounting Policie, Estimates and Errors | + | |
| IAS 10 | Events after the End of the Reporting Period | | |
| IAS 11 | Construction Contracts | + | |
| IAS 12 | Income Taxes | + | |
| IAS 14 | Segment Reporting | | + |
| IAS 16 | Property, Plant and Equipment | + | |
| IAS 17 | Leases | + | |
| IAS 18 | Revenue | | |
| IAS 19 | Employee Benefits | + | |
| IAS 20 | Government Grants | + | |
| IAS 21 | The Effect of Changing Foreign Exchange Rates | + | |
| IAS 23 | Borrowing Costs | + | |
| IAS 24 | Related Party Dislosures | + | |
| IAS 26 | Accounting and Reporting for Retirement Benefit Plans | + | |
| IAS 27 | Consolidated Financial Statements | + | |
| IAS 28 | Investment in Associates | + | |
| IAS 29 | Hyperinflation | | + |
| IAS 30 | Disclosure in Financial Statement of Banks in Similar Financial Instituitions | | + |
| IAS 31 | Investment in Joint Ventures | + | |
| IAS 32 | Financial Instruments: Presentation | + | |
| IAS 33 | Earnings per Share | | + |
| IAS 34 | Interim Reporting | | + |
| IAS 37 | Provisions and Contingecies | + | |
| IAS 38 | Intangible Assets | + | |
| IAS 39 | Financial Instruments: Recognition and Measurement | + | |
| IAS 40 | Investmet Property | + | |

| | | | |
|---|---|---|---|
| IAS 41 | Agriculture | | + |
| IFRS 1 | First-time Adoption of IFRS | + | |
| IFRS 2 | Equity-settled share based payment | | + |
| IFRS 3 | Business Combinations | + | |
| IFRS 4 | Insurance Contracts | + | |
| IFRS 5 | Non-current Assets Held for Sale and Discountinued Operations | + | |
| IFRS 6 | Exploration for and Evaluation of Mineral Resources | | + |
| IFRS 7 | Financial Instruments: Disclosures | + | |

Source: Exposure Draft of a Proposed IFRS for Small and Medium-sized Entities"

The simplification of IFRS for SME for micro-entities could be summed up in the following table:

**Table 4: Survey of possible modification IFRS for SME for micro entities**

| Standard | Name | Simplification | Omitting |
|---|---|---|---|
| IAS 1 | Presentation of Financial Statements | + | |
| IAS 2 | Inventories | + | |
| IAS 7 | Cash Flow Statement | | + |
| IAS 8 | Accounting Policie, Estimates and Errors | + | |
| IAS 10 | Events after the End of the Reporting Period | | |
| IAS 11 | Construction Contracts | | + |
| IAS 12 | Income Taxes | + | |
| IAS 16 | Property, Plant and Equipment | + | |
| IAS 17 | Leases | + | |
| IAS 18 | Revenue | + | |
| IAS 19 | Employee Benefits | | + |
| IAS 20 | Government Grants | + | |
| IAS 21 | The Effect of Changing Foreign Exchange Rates | + | |
| IAS 23 | Borrowing Costs | | + |
| IAS 24 | Related Party Dislosures | | + |
| IAS 26 | Accounting and Reporting for Retirement Benefit Plans | | + |
| IAS 27 | Consolidated Financial Statements | | + |

| | | | |
|---|---|---|---|
| IAS 28 | Investment in Associates | | + |
| IAS 31 | Investment in Joint Ventures | | + |
| IAS 32 | Financial Instruments: Presentation | | + |
| IAS 37 | Provisions and Contingecies | | + |
| IAS 38 | Intangible Assets | + | |
| IAS 39 | Financial Instruments: Recognition and Measurement | | + |
| IAS 40 | Investmet Properties | + | |
| IFRS 1 | First-time Adoption of IFRS | + | |
| IFRS 3 | Business Combinations | | + |
| IFRS 4 | Insurance Contracts | + | |
| IFRS 5 | Non-current Assets Held for Sale and Discountinued Operations | | + |
| IFRS 7 | Financial Instruments: Disclosures | | + |

Source: Own research

### *Financial reporting based on IFRS for SME*

This approach demands the highest costs of producing financial statements (compliance costs) and high level of skills of prepares of financial statements. There is the only tool of micro-entities financial reporting harmonization in the recent days.

## Conclusion

Micro-entities use financial reports for a variety of purposes, such as obtaining credits from suppliers and banks, budgeting, monitoring profit for tax purposes, planning. Taxation purpose is the most significant purpose of financial reporting of micro-entities. In this case is still difficult to argue in favor of financial reporting of micro-enties harmonization. Micro-entities must follow income tax legislation in home country for taxation purpose. If financial information served by financial statement prepared in an accord with IFRS is a source of information for taxation purposes, international standards could replace national standards or current practice.
Harmonization of financial reporting of micro-entities is still the most significant for getting external credits and grants from other countries or EU funds.

There is an important fact, that harmonized financial reporting could be significant source of information for all purposes of micro-enities (including taxation) in the future.

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