

## Implementation of International Accounting Standard 39

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**Abstract:** *The paper describes an implementation of a module for calculating fair values and balance values of financial instruments, according to International Accounting Standard 39. Position balance values are estimated by Amortization Cost Method (method of effectiveness rate of interest). This module is part of Portfolio Management System (PMS) of Much-Net AG. The module is developed in Microsoft Visual C++. The application is a Windows PC based system that operates on many database data sources.*

**Key words:** *Computer Systems and Technologies, International Accounting Standard 39, Amortization cost method, Effectiveness interest method, Object-oriented programming, Financial statements.*

### INTRODUCTION

The basic aim of accountancy is to create truthful information on the financial conditions and realized financial results of the enterprise, needed for making economical decision. That information is classified in an appropriate way in the Annual Financial Report, and its preparation is the final stage of the accountancy process in the enterprise.

On the grounds of the laws having been set into power since the beginning of 2003, the banks and insurance companies in the Republic of Bulgaria have to complete Financial Reports in the effects of International Standards in Accounting. (For all other kinds of enterprises the obligation for application of International Standards in Accounting takes effect from 01.01.2005).

The basic standard in accounting, including definite rules for evaluation and presentation of financial instruments in the financial reports is IAS 39 Financial Instruments – recognition and evaluation. That standard is part of the group of standards, developed as a result of the co-operation between the International Accounting Standard Committee (IASC) and the International Organization of Stock Committees (IOSCO) for the period 1995-2000. Specialists support the opinion that its implementation will give an opportunity more reliable reports to be prepared, and forms a solid base for decision making by consumers of financial information.

The module created for calculation of balance values of financial instruments is part of the Portfolio Management System of Much-Net AG. The purpose of that module is to calculate the amortization and fair values of financial instruments for different fiscal dates, using the interest, price data, and the financial instrument structure.

IAS 39 module allows analysis of investment incomes and calculation of profit/loss for the separate periods analysed, thus providing the information needed for making managerial decisions on reclassification or sale of a given financial asset or liability.

### FINANCIAL INSTRUMENTS – RECOGNITION AND EVALUATION

A financial instrument is defined as a kind of agreement that breeds financial asset for an enterprise and financial liability or instrument of its own funds for another. Based on the standard all financial assets are initially evaluated and recognized in the accounting balance by their prime cost, which is the fair value of the investment granted or received for gaining the financial asset or liability.

#### 1. Classification of financial instruments. Fair values calculation

In order to calculate the financial asset after its initial recognition, the standard clasifies financial assets in four categories:

- Loans/ Receivables originated by the enterprise and not held for trade
- Held to maturity investments
- Financial assets available for sale
- Financial assets held for trading

After their initial recognition, all financial assets are revalued in fair value except those accounted by amortization cost,

- Loans/ Receivables originated by enterprise
- Held to maturity investments
- Financial assets, which fair value not being able to be reliably defined (due to missing market data and reliable methods for calculation of the theoretical fair value)

Fair value is generally defined according to sales price or market price. If such market price can not be reliably defined, fair value is calculated as a sum of all pending payments or incomes, discounted through the prevailing market rate of interest or per cents of an improved instrument (improved in reference to currency, terms, type of interest, e.t.c) by an issuer with similar credit rate.

$$\text{TheoreticalFairValue} = \sum_{i=1}^n (\text{RatePayment}_i + \text{AmortisationPayment}_i) * DF(to, ti) \quad (1)$$

n is count of payments to maturity date, DF is discount factor

$$DF = \frac{1}{(1 + \text{DiscRate})^{\Delta t(to, ti)}} \quad (2)$$

## 2. Amortization cost method and balance values estimation

The amortization cost of a financial asset or liability is the size to which it has been estimated at the time of its registry, minus installments on principal's redeeming, plus-minus amortization accumulated of each difference between that initial size and the notional amount.

A method of effectiveness interest is the method for calculating amortization using rate of effectiveness interest of financial assets or liabilities. The effectiveness rate of interest is the size that makes an exact discount of expected future cash flows until maturity date to present net carried value. That calculation includes all taxes and fees paid or exchanged between the contract parties. The effectiveness rate of interest is also defined as a balanced income until maturity date and is an internal rate of return of financial assets or liabilities for that accounting period.

$$\text{DirtyInitialValue} = \text{PaidValue} + \text{AccruedInterest} + \text{TrFees} - \text{TrTaxes} \quad (3)$$

$$\text{DirtyInitialValue} = \sum_{i=1}^n \text{CashFlow}_i * \frac{1}{(1 + \text{EffectiveIRR})^{\Delta t(to, ti)}} \quad (4)$$

The bond is a promise for payment of a definite amount on a definite maturity date plus recurring interest payments on a definite interest rate. Bonds are mainly used for borrowing means from significant public or institutional investors when the agreement for a single amount (bill) is of too high range to be provided by one lender.

In most cases a given bond is emitted at price, differing from its face value. The difference between the paid value and the face value (notional amount) is presented as premium if paid value is higher or as discount if it is smaller. Premium will be recognized for the term of bond bought. Since the premium is amortized, it will reduce expenses on interests in emitter's ledgers (the discount will raise interest expenses).

$$\text{Premium} / \text{Discount} = \text{PaidValue} - \text{NotionalAmount} \quad (5)$$

The effectiveness interest method is the preferred one to amortize a discount or premium (compared to the linear one), occurring on debt securities (bonds). Based on the effectiveness interest method the discount or premium must be amortize for the debt period in a manner allowing constant rate of interest that is applied to the amount due at the beginning of every period given. Therefore, interest expenses are equal to market rate of interest at the moment of emission, multiplied to that initial value. The difference between the expenses on interests and paid values is a discount or premium amortization.

When emitting bonds, an amortization plan should be prepared, and all records, related to accounting the debt emission are kept based on that. Thus, a possibility for precision check is provided, as the final values in the non-amortized discount or premium

columns and balance value columns must be respectively of zero value and of value equal to the bond notional amount.

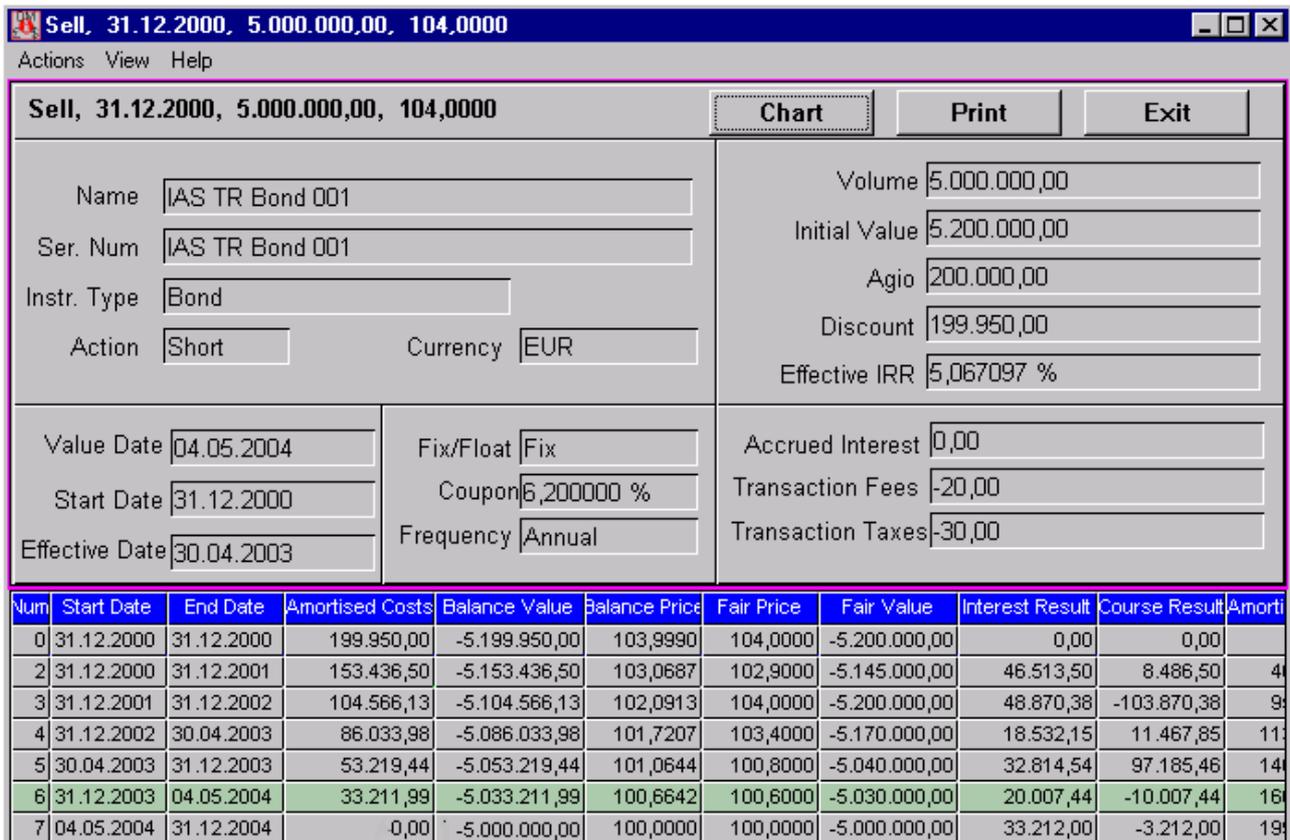


Figure 1 Amortization plan of transaction

$$DirtyBalanceValue_i = DirtyBalanceValue_{i-1} * (1 + EffectiveIRR * \Delta t(t_{i-1}, t_i)) \quad (6)$$

If bonds are emitted between two interest dates, the discount or premium amortization should be calculated for the period between the sales date and the next interest date. This is accompanied by “evening” the amount for the period, calculated by using the usual amortization method.

$$BalanceValue_i = DirtyBalanceValue_i - AccruedInterest_i \quad (7)$$

$$AmortisedCost_i = BalanceValue_i - NotionalAmount \quad (8)$$

$$RatePremium / Discount = BalanceValue_i - BalanceValue_{i-1} \quad (9)$$

Sale of bonds of one emission can be performed on different dates at different market prices, and such sales are called transactions. The standard requires that amortization plan be made up for each transaction. The balance value of a given position, composed of multiple transactions, forms the aggregated balance values of all transactions forming it.

### 3. Acquittal (buying back a debt)

The emitter has the right of pro-term acquittal or buying back the bond or part of it. Accounting the reduction of face value is performed through debt reduction on each transaction contracted with the partner before the date of buying it back. Two accounting methods are applied for debt reduction and balance value calculation of the bought up debt – FIFO (First-In First-Out) and average weighted value.

In both cases a debt reduction coefficient is defined, and the cost value of bought up nominal is defined by the formula:

$$CostPrice_{buy\_back} = \frac{\sum_{i=1}^k (BalanceValue_i * CoeffReduction_k)}{NotionalAmount_{buy\_back}} \quad (10)$$

k is count of previous sell transactions, that take part in prime cost estimation of back buy transaction.

The difference between the net balance value and the buy back price of the debt should be presented as a profit or loss for the period it has been acquitted. That profit or loss have to be recognized as a current financial income or expense and have to be set in the Emitter's Income and Expense Report for the period of it occurrence.

The non-amortized premium or discount and the emission expenses must be registered as per buy back date and considered in the process of profit or loss defining.

Remaining debt, premium or discount of sell transactions continue to amortize, using effective interest rate for each sell transaction.

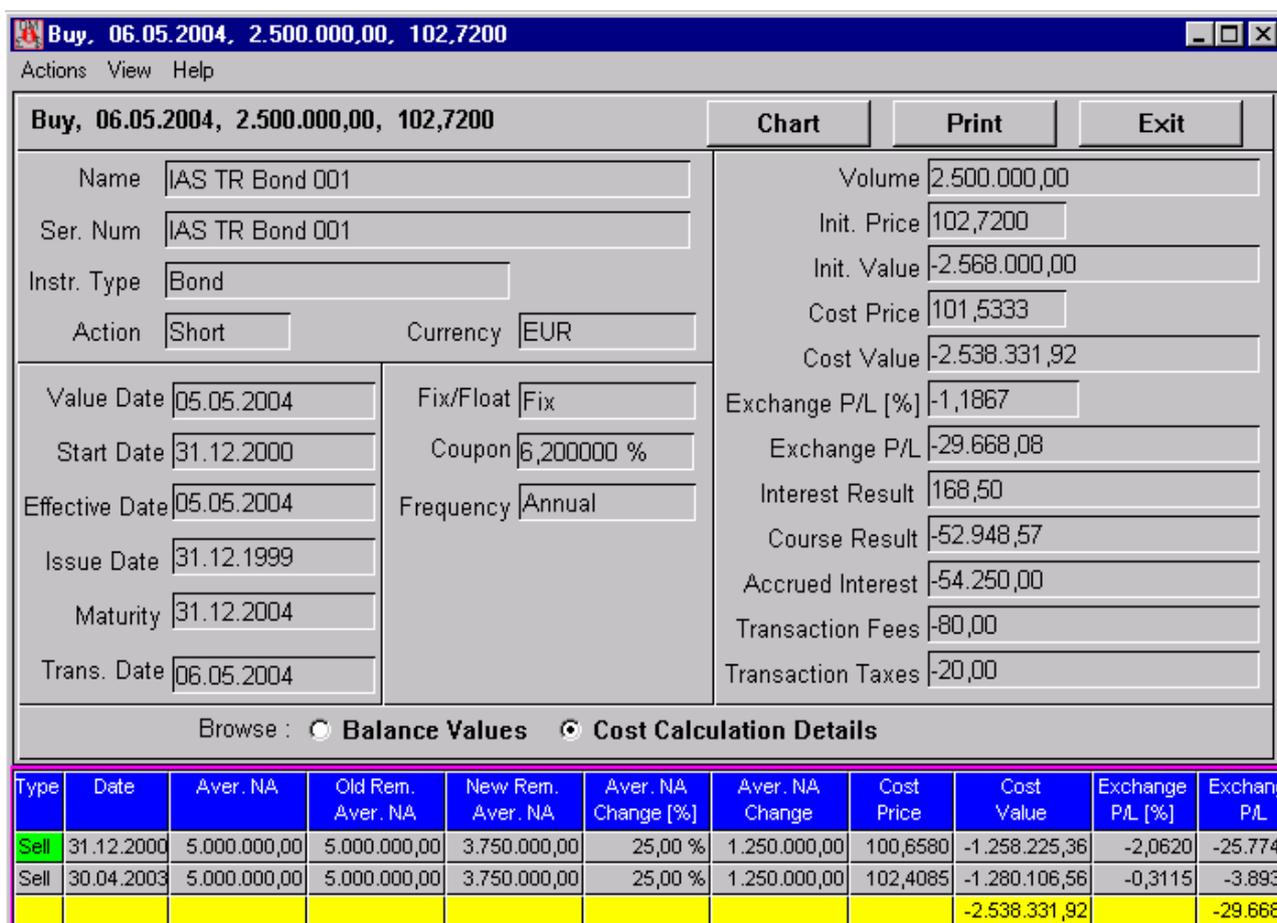


Figure 2 Buying back a debt

#### 4. Reclassification Available for sale (AFS) as per Held to maturity investment (HTM)

The standard comprises cases when investments, initially classified as such being available for sale, can later on be reclassified held to maturity. Should it be done, the fair value at the moment of reclassification turns into base for an investment price.

The difference between fair value and amortized value of the investment on the date of reclassification forms a premium that can be accounted in the assets for that period. Should that profit be recognized in the shareholders' own funds, it will be accounted through its amortization in the profit over the period remaining to maturity.

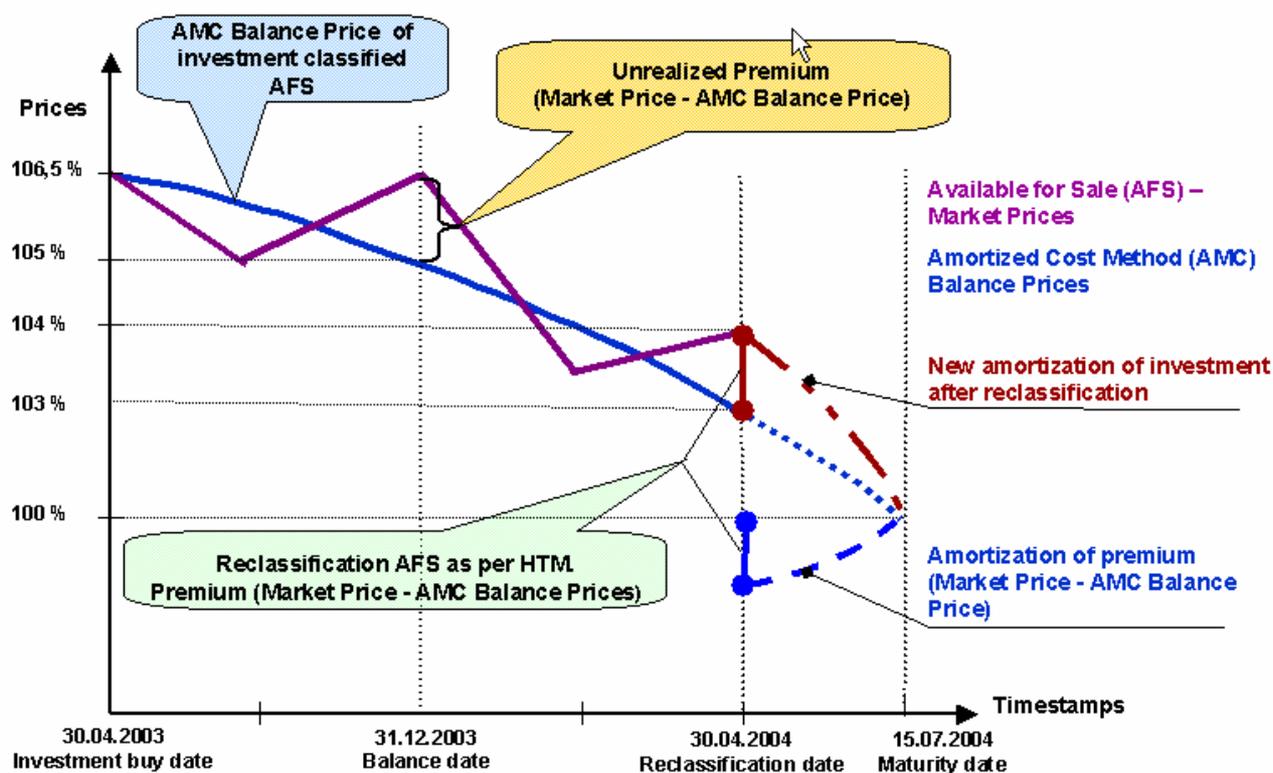


Figure 3 Reclassification AFS as per HTM

In this module the amortization of the new acquisition price and the premium received as a result of reclassification are accounted as two additional transactions, and effectiveness rate of interest is being calculated for each of them thus it being amortized for the remaining time until maturity date of the instrument.

Accommodation initial price (acquisition price) is calculated as  $100\% - (\text{MarketPrice} - \text{BalancePrice})$ . This price is used to calculate amortization of premium.

## 5. User interface

The user interface is based on a multi-window GUI. Positions are allocated in portfolio hierarchy structure. Sub-portfolio results are displayed in different windows.

Instruments, trades and market data are loaded from Portfolio management system (PMS) [3] database. Module IAS 39 is based on instrument leg structure, built by PMS base module [3].

Amortization plan is build for each sell transaction, and cost price of back-buy amount, profit and losses are estimated for each back-buy transaction. Position results are aggregated transaction results for each fiscal date.

Balances are stored into report tables and can be printed using Crystal reporter. Reports of transaction's amortization plans, cost prices and profit/losses can be added to accounting ledger.

Module reporting tool supports comparison of balances calculated at different timestamps, and gives an ability to analyze effect of market changes on AMC balance value and profit/loss of financial instruments.

Fair prices and balance prices until maturity are represented in tabular and graphical mode using Olectra chart.

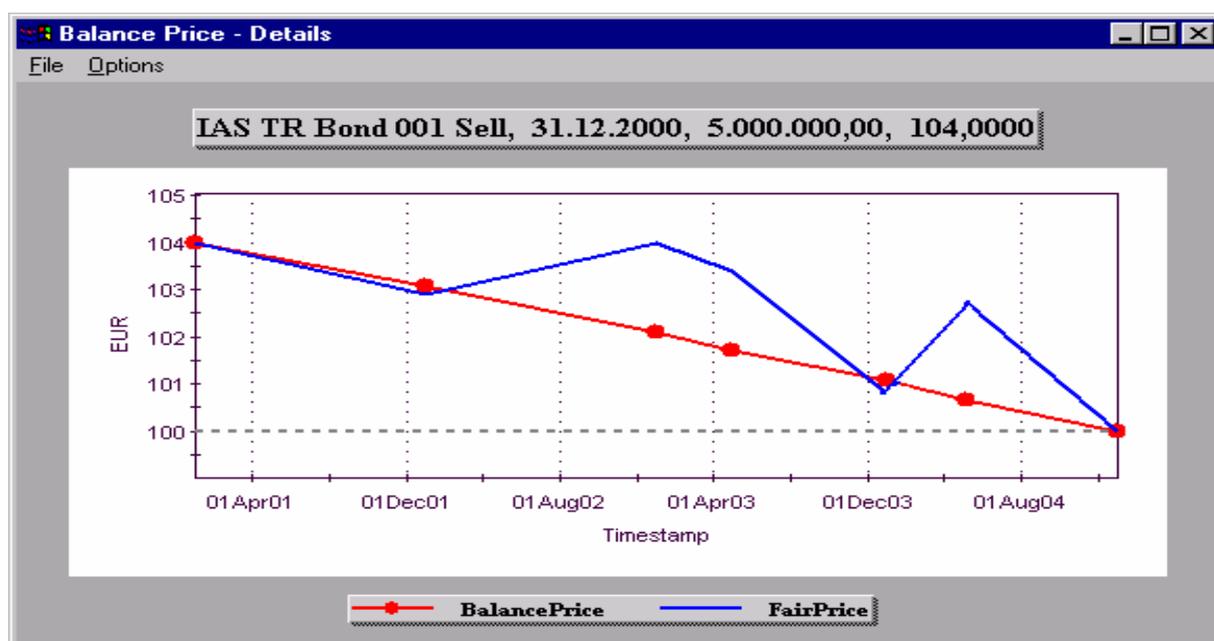


Figure 4 Graphical presentation of balance and fair values by Oletra chart

## CONCLUSIONS AND FUTURE WORK

IAS 39 laid the beginning of a new stage in accounting treatment of financial instruments and their presentation in financial reports. Its implementation requires development of set of instruments to assist financial calculations related to defining amortized values of debt securities, restructuring of financial instruments from one category to another, defining the investment balance value, e.t.c. It is very important for all financial institutions acting on the territory of Bulgaria, as the fund market in Bulgaria is still weak, which practically does not allow the fair value concept to be implied.

IAS39 module prepares information for accounting reports for the financial instruments and provides opportunity to make managerial decisions in reference to reclassifying or selling a given financial instrument.

Realization of the remaining reclassification possibilities and calculation of indices specific for each type (profit/loss when changing the category, amortization of differences in values at reclassification) has been envisaged as a next stage of that module development.

The balance values, calculated in that manner, can be entry data for accounting systems used by banks and insurance companies. That would allow automatic distribution of balance values by accounting articles analytical signs, i.e. automatic construction of financial reports for financial assets and liabilities analyzed through IAS39 module.

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