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# **Inwestycje finansowe i ubezpieczenia – tendencje światowe a rynek polski**



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## MULTI ENTRY FRAMEWORK FOR FINANCIAL AND RISK REPORTING

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**Summary:** The author challenges one of the oldest accounting double bookkeeping rules, used since 1494, and proposes instead the application of the quadruple accounting entry. He presents the concept of the multiply accounting entry for the risk financial statements and risk management. The development gap concept is described and introduces a simplified entry and reporting example. The model is illustrated with a number of financial-risk statements and attributes including the journal entries. The potential completion edge for users is weighted against costs and benefits.

**Keywords:** audit, reporting, , double-entry, risk management, conceptual framework.

### 1. Introduction

A basic function of the accounting and reporting system is to provide information to settle a mutual investment. It was already Cowan who raised the argument of utility functionality of reporting [Cowan 1968]. Historically the task was to value the contribution and commitments into a project by capital providers and stakeholders (e.g. foreign investment to acquire rare ingredients) [Petram 2011] and then to value the result and its fair allocation among capital providers. The activity presented above is sensitive to time constraint, errors (both intentional and unintentional) and subject to some level of judgment. Therefore an important function of reporting is its credibility. The reporting should be unambiguous as well. To enhance the credibility, a system of the financial assurance has been developed. The beginning of the system is backdated to British Company Act [Anon 1856], where first instances of the audit requirements (early in form of the internal audit) were enacted. The application of the assurance system opened a technical matter: assurance is functional unless methods and documents are deterministic. In consequence the deterministic postulate

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manifested itself with the historical accounting principle, where the value of assets and liabilities had been established as a past cash outflow, verifiable directly to the accounting documents such as invoices, good dispatch notes etc. The usual period for reporting represents one year or twelve subsequent months. In order to perform a full scope of substantive audit all accounting evidence must be traced back to records which is possible but time consuming. On the other hand the financial statements users need relevant and quick information for their decisions, therefore, by introducing the level of correctness (materiality) a timing of information could be provided.

In line with the economic development and changes in the financial environment the fundamentals for the historical values became a little out of date. The economic value of an asset was defined as the expected present values of cash flow generated by this asset. In case of the long term assets the fragility of this definition was linked to the volatility of the discount factor. The unequivocal value of discount factor could not be stated without further assumption on the capital provider preferences such as cost of capital, risk *appétit* and so on. The accounting itself by using the historical value of assets stands in contrary to economic values. In order to decrease the gap the accounting adapted firstly the link to market values by reference to the foreign exchange year end rates, than indexation for the capital gains, revaluation of the fixed assets, impairment correction and provision for liabilities and finally valuation of assets and liabilities to their fair values. Due to the increase of the judgment and underlining assumption the values reported through the profit and loss account tended to be more stochastic than deterministic. In practical terms it shifted the attention from historical to fair values accounting. The consequences were to change audit procedures from the reconciliation to the underlining documents, to judgments on the valuation assumption applied. By the application of IAS 39 a bridge was build between historic and fair value accounting for financial instruments and a transmission channel for the fair value volatility which further investigated as the 2008 crisis occurred by others [Barth and Landsman 2010; Bischof et al. 2010; Strampelli 2011].

Free-market societies based their early warning system for financial systems on the accounting financial reports (e.g. going concern disclosure, bankruptcy procedure) or recently the capital requirements procedures, where financial statement is the starting point. Therefore any changes in the reporting system transmit themselves widely into the real economy processes. The above outlined trends give right to consider the alternatives in financial reporting. However, a short review of key assumption must be earlier outlined.



## 2. Basic characteristic of the applied financial and risk reporting system

A currently used system of financial and risk reporting is based on numbers of compromises summarized below.

### *Timing versus correctness (materiality)*

The issue could be described as the ration of the timing of preparation and validation of the financial statements to its credibility. For audit procedures the preliminary financial statements are used, usually prepared after the end of a year. The shortening of the time available between the date of preparation of the reports and the date of its publication (including verification beforehand) results in the limitation of the scope and substantive of the procedures volatility, which in turn yields in application of the higher tolerance for errors. However, there are a lot of procedures which are not adjustable in respect of time (e.g. financial statement closing process and disclosure).

### *Principles versus rule based system*

In practise there are two basic frameworks the principle based framework and the rule based accounting. The first approach is based on the fair and true concept and general rules, while the rule based approach is more procedural and specific. In the principle of based approach there is a significant space for interpretation while the rule based approach is very accurate. On the other hand the rule based approach tends to be large and complex, which results in spheres of contradictory regulation.

### *Method of valuation and ability of its verification*

Valuation methods could be grouped into:

a) fair values methods – representing the value of assets in normal course of business exchange between willing, not related parties and

b) amortized costs methods, which represent value of the assets and liabilities under assumption on negligible credit risk exposure.

The historical cost methods represent the most conservative approach, while the assets value is a historical cash outflow. The preference of the financial statement user is an equivocal, verifiable, prompt and long standing valuation method. The majority of the above mentioned attributes possesses the fair value derived from the effective market. The existence of effective market is not necessary a case of small market e.g. Polish one [Dobija and Klimczak 2010]. In the case of the lack the effectiveness on the market, the historical costs tend to be equivocal and verifiable. However this is not a time and inflation resistant method. The alternative approach is a fair value derived from the model while input data is from the semi-efficient market. In consequence the model assumptions constitute the space for volatility of the model results. Sacrificing the functionality of the results, time and environment benchmark dimension are gained. To illustrate the case let us examine the example

using the Gordon model: a stock of carrying value of \$2000 pay off stable dividends in value of \$100, cost of equity amounts to 5% p.a., has a normal distribution and standard deviation of 1%. Therefore the value of stock varies with 95% likelihood within the range of \$1437 and \$3289 ( $100/(5\%+1\%*1,96)$ ;  $100/(5\%-1\%*1,96)$ ).

In case the above mentioned stock would be the only assets on the balance sheet the entity could report either loss of \$563 or gain of \$1238 with equal probability.

### ***Communication credibility against the competition edge***

If, for a given entity, all economic transaction was disclosed, than the investor would possess all information to take an investment decision. Such a model would, however, impact the ability of the entity to create a competition edge. Another aspect of the model would be the quantity of information to be processed and aggregated. Thus the reporting should be disaggregated enough to provide manageable information and aggregated to such a level not to jeopardize the commercial position of the entity.

Taking into account the above stated boundaries it is possible to create an alternative reporting framework to limit the compromise, which must be made.

## **3. Model**

### ***Problem definition***

The development of the reporting system started from the single reporting sheet of balance and profit and loss statements towards the set of financial reporting including accounting policies, balance sheet, cash flow, capital movement and notes. As the result of that the size of the financial statements itself reached a significant level (e.g. consolidated financial statements of PZU group consist of 115 pages, as of December 31, 2010). Overformalization and complexity of financial statements compromised a communication and credibility postulate. In order to safeguard standards for medium and small entities the limit for auditing requirements has been established together with a dedicated standard for SMEs. Current pressure to shorten the time available for financial statements closure process results in the increase of the detection risk.

The risk management practice requires more dedicated standards; therefore, based on the Basel Accords the European Commission recommends with CEBS (now EBA – European Banking Authority) a set of the supervisory reporting standards FINREP and COREP. Both standards are released with non binding recommendation for the application of xml or XBRL technical standards. Those trends require, however, skilled staff and significant investments.

### ***Systemic postulate***

The research problem is to construct the reporting system used to settle the stakeholders, which is credible, and verifiable, short, compact and understandable, quick

and economical, and which describes both historical aspect of value and addresses the risk profile of an entity. (The “systematic postulate”).

Currently used system does not necessarily meet all characteristics of systematic postulate.

Today the key concept in accounting is double-entry, a system which represents all business transactions in the form of transaction date, value, change in assets, change in passive (dr., cr.). Double entry was described already in 1494 [Pacioli and Paganini 1974]. This atomic entry mechanism gives controls over the completeness of records, values and reacts with the precision of a single business transaction, which builds the fundament for further aggregation. The generic version of double-entry allows for a comprehensive aggregation within balance sheet, profit and loss account etc., although it allows to enhance the system to multilateral duplication of entries and its aggregation into the different grouping formats e.g. profit and loss by nature and by calculation (application of #490 account). This solution is based on the single value of the transaction. Conceptually the application of different grouping is just an extension of the double-entry mechanism, thus a mechanism of multi-main ledger system is obtained.

An attempt for a triple accounting has been presented by Ijiri [Ijiri 1986], who added up the momentum aspect to the double-entry. The proposal was criticized [Fraser 1993]. Lack of utility and practical application has been raised. Another attempt to enhance Pacioli proposal was a quadruple entry applied for the national accounts [Postner 1988]. This concept linked the micro and macro accounting for national account, and Postner’s proposal turned out to be not necessary practical one.

### ***Solution proposal***

Let us enhance a classical double-entry by additional value so called risk value (RW)<sup>2</sup>. Doing so an additional dimension of reporting is obtained. Every transaction would be recorded, in addition to traditional double-entry, with two entries: risk debit and risk credit (RDr., RCr. ). Thus not a double-entry is obtained but a quattro-entry (this is not a multiplication of the double-entry because the additional value is attached to the record). As a result every business transaction is described by two values: one based on the classical accounting rules and the second on the value of risk. There are used at least four accounts, two of them the accounting records and two the risk accounts. Creating an integrated balance sheet and profit and loss and risk profile, it is possible to merge the reporting with classical scalar of values and risk. This single approach utilizes the basic characteristic of accounting approach which is verifiability. It opens the possibility to apply historic accounting to the financial reporting and fair values to the risk measurements. This in turn allows separating the auditing procedures both for finance and risk. Therefore for the system with higher quality reporting both auditing systems could be applied while for SMSs companies only

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<sup>2</sup> Without taking into account any given value.

the first one (any other criteria such as the dilution of shareholdings; public companies etc. could be applied). For risk valuation the existing already procedures could be adapted, for example Basel accord implemented with 48 and 49/2006 directives for EU or Solvency II for insurances with adjustment while the risk value of single transaction would be an incremental part of risk portfolio. By separating those two systems of reporting risk disclosure is more coherent with the systemic postulate in terms of financial reporting equivocality.

#### 4. An application example

Currently applied reporting techniques could be outlined as follows:

**Table 1.** Extract from financial statement – standard used

Balance sheet and profit and loss statement for the period ended 31 December 20X2			
Note (extract)			
Asset	(Notes)	EUR	
A. Fixed assets		100	(1)
B. Current assets	(1)	200	Current assets include the securitized receivables of 50 EUR valued at cost
Total assets		300	
Liabilities and equities			
A. Capital		50	(2)
B. Liabilities and provisions	(2)	250	Provision for jubilee and retirement payments in amount of 180 EUR is discounted with technical rate at 3% p.a.
Total liabilities and equities		300	
Revenues		500	
Costs		480	
Profit (loss) net		20	

Source: own study.

By enhancing the above shown financial statements with the risk dimension the following reporting is obtained:

**Table 2.** Extract from financial statement – standard used and risk entry

Balance sheet and profit and loss statement for the period ended 31 December 20X2

	Financial		Risk	Risk	
<b>Asset</b>	notes	EUR	EUR	notes	(1)
A. Fixed assets		100	<b>30</b>		Current assets include
B. Current assets	(1)	200	<b>500</b>	(a)	the securitized
Total assets		300	<b>530</b>		receivables of 50
					EUR valued at cost
<b>Liabilities and equities</b>					(a)
A. Capital		50	<b>330</b>		Credit risk of securitized assets
B. Liabilities and provisions	(2)	250	<b>200</b>	(b)	valued at nominal value
Total liabilities and equities		300	<b>530</b>		Receivables
					(2)
					Provision for jubilee and retirement payments
Revenues		500	<b>200</b>		in amount of 180 EUR is discounted
Costs		480	<b>280</b>		(b)
Profit (loss) net		20	<b>-80</b>		Value of receivables before discounting

Source: own study.

In comparison with double-entry, the quattro-entry allows for the presentation of both the value of the item and its value of risk. It is so because the quattro-entry inherits the vertical and horizontal decomposition of accounts e.g. revenue risk position of profit and loss account can be disclosed in various risks. Revenue of 500 EUR (financial value); while 200 EUR (risk value) allocated to 120 EUR – market risk, 50 EUR operational risk, 20 EUR credit risk 10 EUR – other non measurable risks.)

Another consequence of application of the quattro-entry is the ability to discriminate the financial statements against risk profile. It allows as well disclosing the profile of the off-balance sheet risk exposure. An illustration of this attribute is shown in table 3.

**Table 3.** Extract from financial statement – standard used and risk entry; discrimination ability

Balance sheet and profit and loss statement for the period ended 31 December 20X2

	Entity A		Entity B	
		Risk		Risk
<b>Asset</b>	EUR	EUR	EUR	EUR
A. Fixed assets	100	<b>30</b>	100	<b>30</b>
B. Current assets	200	<b>500</b>	200	<b>30</b>
Total assets	300	<b>530</b>	300	<b>60</b>
<b>Liabilities and equities</b>				
A. Capital		<b>330</b>	50	<b>0</b>
B. Liabilities and provisions	250	<b>200</b>	250	<b>60</b>
Total liabilities and equities	300	<b>530</b>	300	<b>60</b>
Revenues	500	<b>200</b>	500	<b>10</b>
Costs	480	<b>280</b>	480	<b>10</b>
Profit (loss) net	20	<b>-80</b>	20	<b>0</b>

Source: own study.

In general entity A indicates higher risk accumulation position than entity B. Both entities disclose the same financial position and different risk structure. A similar characteristic can be observed while making a time series analysis.

**Table 4.** Extract from financial statement – standard used and risk entry; discrimination ability for time series analysis

Balance sheet and profit and loss statement for the period ended 31 December 20X2, X1, X0

	20X2		20X1		20X0	
		Risk		Risk		Risk
<b>Asset</b>	EUR	EUR	EUR	EUR	EUR	EUR
A. Fixed assets	100	<b>30</b>	100	<b>30</b>	100	<b>30</b>
B. Current assets	200	<b>500</b>	200	<b>400</b>	200	<b>30</b>
Total assets	300	<b>530</b>	300	<b>430</b>	300	<b>60</b>
<b>Liabilities and equities</b>						
A. Capital	50	<b>330</b>	50	<b>400</b>	50	<b>0</b>
B. Liabilities and provisions	250	<b>200</b>	250	<b>30</b>	250	<b>60</b>
Total liabilities and equities	300	<b>530</b>	300	<b>430</b>	300	<b>60</b>
Revenues	500	<b>200</b>	500	<b>130</b>	500	<b>10</b>
Costs	480	<b>280</b>	480	<b>160</b>	480	<b>10</b>
Profit (loss) net	20	<b>-80</b>	20	<b>-30</b>	20	<b>0</b>

Source: own study.

While the same results and financial position are observed, the risk profile indicates a strong fluctuation on the entity level.

## 5. Technical matters for quattro-entries

The application of quattro-entry encompasses some practical assumptions regarding the risk calculation. In general the risk bearing part of balance sheet is the position of assets and off balances sheet guaranties<sup>3</sup> and in some cases liabilities (actuarial and operational risk ).

Thus the main reason of the increase or decrease of the value of risk (or changes in risk profile) is due to the assets composition. Every asset entry could be presented in the form of accounting value and changes in risk value.

Table 5 shows a typical set of the financial and corresponding risk entries.

**Table 5.** Journal entries extract

No	Description	Value	Dr.	Cr.	Risk value	RDr	RCr
1	Payment of capital	100	Bank	Capital	20	Bank	Increase.* risk
2	Newspaper purchase	5	Cost	Bank	1	Risk decrease	Bank
3	A transfer between bank accounts to the account with a 0% risk charge.	95	Bank	Bank	a) 19	Change of risk**	Bank
3b					b) 0	Bank	Risk increase
4	Option issue	1	Instruments for trade	Financial incomes	a) 0.1	Instruments for trade	Risk increase
4a	PB notional value of option	100		Off balance sheet	b) 0	Off-balance sheet	Risk increase
5a	Purchase of the instruments for trading	20	Instruments for trade	Bank	0	Change of risk.**	Bank
5b					35	Instruments for trade	Risk increase
6	Issue of the zero coupon bonds by the entity	200	Receivables	Financial liabilities	60	Receivables	Risk increase
7	The closure of the general and closing entry for the profit and loss account and risk statement						

\*Risk increase \*\*Risk decrease (results accounts)

Source: own study.

<sup>3</sup> Under assumption on the valuation of equity in historic values and liabilities at cost or amortized costs.

The financial entries are valued in accordance with generally accepted standard (e.g. IFRS, US GAAP, PL GAAP etc.). The risk entry value is valued in accordance with risk standard (e.g. Basel or its implementation)<sup>4</sup>. For the example purposes the simplified methods were used; there is no split between credit, market or operational risk.

After the processing of all entries it is possible to obtain the following combined financial and risk sheet (comparatives balances have been omitted for the simplification purposes):

**Table 6.** Balance sheet, profit and loss and risk profile statement base on the journal entries

Financial balance sheet		Risk statement		Profit and loss account	
<b>Off balance sheet</b>		<b>Off balance sheet</b>		Revenues	1
Option	100	Option	0	Cost	5
<b>Asset</b>		<b>Asset</b>			
Bank	75	Bank	0		
Instruments for sales	21	Instruments for sales	35.1		
Receivables	200	Receivables	60		
<b>Total</b>	<b>296</b>	<b>Total</b>	<b>95.1</b>		
Equity		Risk <sup>5</sup>			
Basic capital	100	Increase	115.1		
Results	(4)	Decrease	(20)		
Liabilities	200				
<b>Total</b>	<b>296</b>	<b>Total</b>	<b>95.1</b>	<b>Result</b>	<b>(4)</b>

Source: own study.

As the results of the above procedures a comprehensive financial and risk statement is built. The off balance sheet positions are equal both for risk and financial statements. The risk statement could be presented as disaggregated between various types of risk such as market, credit and operation. The risk profit and loss statement can be aggregated against financial position of profit and loss or against types of risks. The reconciliation of the financial equity to the supervisory capital might give the right to present capital requirement coverage.

<sup>4</sup> But the risks measured on the portfolios are recalculated for the transaction purposes as the incremental value.

<sup>5</sup> Position possible to disclose profit and loss statement in risk or to extend the financial presentation for basic types of risk.



## 6. Proposal discussion

The model allows splitting information between the financial and risk data, which in consequence influences speed and correctness of information flow. The application of the dual system for financial and risk reporting brings higher precision to the financial part of reporting while on the other hand the valuation risk stays untouched with risk reporting.

The potential benefits of quattro-entry is outweighed by universal application of double entry accounting for the tax settlements, international standards, Basel standard measurements etc. The potential benefits for dual reporting is linked to the uncertainty generated by application of both judgmental entries (fair values without efficient market references) and verification effort and timing. The change in financial reporting of this magnitude is unlikely to happen, however, an attempt for managerial reporting seems to be more likely. Another set of potential issues arises from the technical matters for quattro-entry; the journal entry system needs additional intellectual investments as the number of issues would only arise under its practical life application. Until now the untypical entries have not been challenged. The basic model does not refer to the hard-quantifiable risk such as reputation, legal and other similar risks. As the dual system is an external system to the entity, the intra-group risk generated by the structure [Staszkievicz 2011] might be difficult to reconcile. Nevertheless the presented system could be practically applied for the mutual funds managerial accounting without significant additional investments. On the Polish market the applied accounting solution tends to be in line with the rules based framework and therefore it opens space for the practical application of the model at least for a managerial system. The proposed solution might be implemented for limited liability partnerships entities (a relatively new type of partnership in Polish environment) as a tool for the inter-partner risk allocation.

The dual system of disclosure inherits material attributes of the double-entries such as its variability and ability to reconcile between financial and risk reporting. It is comprehensive, compact in terms of presentation, but it requires additional time and workload as every entry does not need double but quattro entry. Currently applied methods for risk calculation are often based on calculations such as the average results for the operation risk, portfolio of instruments or policies for market and actuarial risk respectively. This and many other facts make the model rather theoretical than practical.

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## ZAPIS POCZWÓRNY JAKO MECHANIZM POZWALAJĄCY NA INTEGRACJĘ SPRAWOZDAWCZOŚCI FINANSOWEJ I OSTROŻNOŚCIOWEJ

**Streszczenie:** Zaproponowano koncepcję rozszerzenia zapisu podwójnego do zapisu poczwórnego jako mechanizmu pozwalającego na integrację sprawozdawczości finansowej i ostrożnościowej. Wskazano na zalety i wady zastosowania mechanizmu dualnej prezentacji wartości ryzyka i wartości finansowej w sprawozdaniach zintegrowanych. Zaprezentowano koncepcję luki postulatów systemowego. Omówiono bieżące tendencje w sprawozdawczości finansowej. Artykuł ilustruje uproszczony przykład zastosowania zapisów dla celów sprawozdawczych.

**Słowa kluczowe:** audyt, sprawozdawczość, zarządzanie ryzykiem, zapis wieloraki.