Harmonization of International Accounting Systems During the Globalization in Developing Countries

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Abstract: By looking at the experience of IFRS implementation in Russia the article presents an experience of matrix model implementation which can be considered as a meta-model of accounting. In this paper several issues, which require thorough investigation are raised. By considering the matrix model as a platform for the harmonization of international systems of accounting the paper also demonstrates that the formulae of matrix accounting allow to fulfill accounting tasks as effectively as by using well-known accounting methods or accounting computer software. The main aim of the paper is to show how situational matrix modeling can be used in the process of transition to IFRS and its effect on tertiary education system. This paper also provides accounting educators with insights into the historical context of the IFRS in Russia. In addition the paper briefly considers the implications of the transition to IFRS in Russia. The paper contributes to the existing problems caused by transition and suggesting ways to improve this process.

Key words: IFRS • Matrix modeling • Harmonization • Globalization

INTRODUCTION

Since the paper is devoted to the transition of the accounting system in Russia to IFRS, it looks at the history, approaches and teaching of IFRS in Russian Federation in order to provide a broader international perspective of this important arena that shapes the view of accountants. Besides, the paper illuminates the most of the problems, connected with the transition process in Russia. It is done by describing the overall context of accounting education and experience in implementing of IFRS within the contemporary Russian system of higher education and accounting.

International standards influence to local accounting mostly by two ways: by insertion of its parts into legislative requirements and local standards as well as by direct IFRS financial reporting by significant amount of Russian enterprises, e.g. credit organizations, which are required to do so by statute of the Bank of Russia.

As the development of any science implies creation and improvement of the objects researched by a science. Accounting is not an exception in this sense1. Moreover, accounting itself is a means of modeling of economic relations between the institutional units which are actualized in accounting events. That’s why the method of modeling focused on designing models in the area researched in accounting can be considered as one of the basic tools of its theoretical development and, on this basis, of its practical application perfection.

However, the methods of modeling the technology of accounting (from initial records to formation of accounting reports) practically repeats with great exactness the same steps which are implemented in practice, using provisional numerical examples. For accountants in Russia traditionally inherent the approach of “the priority of form over content”, which is not consistent with the spirit of IFRS. Historically, the State was the main and the only user of financial information and the major application of accounting was limited to tax reporting. Besides, IFRS does not fit into the existing structure of the Russian legislation. Finally, in Russia there are many people who need to teach IFRS, it is about three million accountants.

This fact seems to be a stumbling block on the way of harmonizing of national accounting systems as it complicates their conceivable due to the difficulty of their observation and the visible variety of accounting techniques. From this statement it follows that it is


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necessary to move in the direction of creating accounting meta-models which are compact and universe and which are invariant to the initial accounting data but easily adaptable to the existing national accounting systems in all their diversity. One of the effective tools of creating such meta-models is mathematic modeling, in particular the one which uses the basic notions and operations of matrix algebra.

**Literature Review:** The implementation of International Financial Reporting Standards in Russia has been discussed by the accounting profession for more than a decade. The united opinion of professionals is that those standards must become an integral part of business life of enterprises and be included in statutory norms in Russia.

As one of the brightest our contemporary scientist Ya.V. Sokolov remarks in his paper “Accounting education in Russia today” [1]: “The West has not perhaps appreciated the role of the command or planned economy on the provision of education. The extent and detail of that involvement is first reviewed in respect to accounting education. The changes which are already under way are described and future trends in which Western academics may participate are outlined. Russia and the rest of the former Soviet Union (FSU) is in the process of changing a well-established, clear structure of education for a less rigid but more idiosyncratic approach. Accountants and accounting educators in other countries should be aware of the history and emerging structures in Russia and the FSU if their involvement is to be worthwhile”.


The problems of accounting development and IFRS implementing were discussed in works by following authors: A. Bagaeva, [4] A.J.H. Enthoven, [5], T. Krylova, [6], R. McGee and G. Preobragenskaya, [7], R.H. Sarikas, and A.M. Djatej, [8].

**Accounting in Russia:** Like any field of human activity, accounting in Russia was influenced by different circumstances. The primary role belongs to the European school of thought. The connection was established in the XVIII century by Peter the Great who undertook several financial and accounting reforms to introduce the cameralist method of accounting. The accounting reform was established to satisfy specific State’s needs for improving public administration and was largely influenced by Swedish and Dutch accounting practices. Considerable attention was given to developing accounting education, in particular, setting up special accounting schools and training of first accountants. As part of the educational reform, people were sent abroad to learn about European accounting model and to bring books on accounting that were translated later into Russian. Thus, the creation of accounting regulatory framework was done simply by transferring western accounting practices.

Development of accounting in Russia was guided by application in five business areas, including monasteries, manor houses, households, trade and usury, construction and industrial production. One of the vivid examples of application of a newly established accounting framework was Regulation “On management of Admiralty shipyards” dated April 5, 1722 and announced after the construction of a shipyard in St. Petersburg. This document provided a fairly rigorous system of cost accounting and influenced the entire accounting system.

Abolition of serfdom in 1861 and further industrialization of the country brought the need for further improvements in accounting. Development of state factories required much more detailed framework for cost accounting. One of the innovations of the XIX century was introduction of the “Journal”, a document that listed all business transactions in a chronological order. Another innovation was introduction of accounting for labor in the "List of craftsmen" and accounting for raw materials in a special bookkeeping journal. In the end of the XIX-beginning of the XX centuries Pavel Reinboth promoted the concepts of direct and indirect costs, developed the annual absorption costing system and introduced "rate of costs" as one of the primary indicators of production efficiency.

Developments in cost accounting brought about improvements in financial accounting. The double-entry method was widely spread, but was still based on the German model of accounting where all homogeneous transactions were accumulated in the General journal and finalized in the General Ledger in the end of the accounting period. Innovation of the time was wide promotion of the Italian model of accounting where each transaction had to be recorded in a journal separately and transferred to the general ledger separately as well. “Course in double-entry accounting” by Alexander Prokofiev that described this system, became the guideline for several generations of Russian accountants. However, despite advances in corporate development,
the double-entry system was more established in cost accounting than in corporate accounting. In the meantime, a group of researchers tried to challenge the principles of the double entry system and introduce their own accounting systems. However, such innovative accounting systems did not withstand the time test (e.g. the triple-entry system introduced by Fedor Jezierski).

Accounting development continued with establishment of “Schetovodstvo” (Accountancy) journal. Published between 1888-1904, the journal included papers of well-known in Europe accounting professionals, namely, Adolf Wolf, Alexander Beretti, Lev Gomberg and others.

Accountancy profession at that time required intelligence, education and analytical thinking. Development of business sector created high demand for accounting professionals who were well rewarded for their services and were well respected in the society.

Significant changes in the Russian economic environment took place with the collapse of the USSR. During the 90s, accounting reflected changes associated with a transition from a command control system to a market economy that resulted in a growing demand of professional accountants in fast-growing business areas. Besides, new forms of enterprises (e.g. cooperatives and joint Soviet-foreign enterprises) required new accounting rules. Harmonization with international accounting standards was able to partially resolve these issues, but did not solve the main problem of Russian accounting. The State remains the main user of financial information and the major application of corporate accounting is limited to tax reporting.

During the 2000-2008 the re-birth of Russian accounting took place. It was caused by economic growth spur driven by private consumption and investment, dramatic increases in the world prices on energy and commodities [9]. In such circumstances, a question of harmonization with international accounting standards became of utter importance.

The Concept of Accounting was formed during the transition period from planned to market economy. Its main purpose was to change the main aim of accounting: in planned economy accounting aimed to provide information for the State, the new Concept of accounting was to create a market-based infrastructure that provides a favorable climate for private investment, including foreign investment. Since, in Russia, historically Continental system of regulation of accounting was used, the adoption of the Concept in 1997 has shifted the model of regulation of accounting and reporting to the Anglo-American one.

Problems of Implementation: Among the most serious problems of IFRS implementation in Russia, it used to mention the next:

- The lack of official status of financial statements prepared under IFRS, as well as the necessary infrastructure of IFRS;
- The formal approach of regulators and businesses to many categories, principles and requirements of the accounting and reporting, comply with the conditions of market economy;
- High costs of business entities to prepare consolidated financial statements according to IFRS through the transformation of financial statements prepared under RAS;
- Significant administrative burden on businesses to report excessive reporting to state authorities, as well as unnecessary costs because of the need for parallel accounting to tax records;
- Poor quality control system accounting, including the poor quality of the audit of financial statements;
- Lack of involvement of professional associations and other interested public, including users of financial statements, management accounting and reporting;
- The low level of training most of the accountants and auditors, as well as lack of skills in the use of information prepared under IFRS.

As the professor V.G. Getman [10] notes, the above problems are not solved so far. The fact that the concepts outlined the following objectives:

- Conduct training on the reorientation of accounting in-depth study of IFRS;
- Monitoring of the quality of educational programs;
- Implementation of management training in this regard;
- Ensuring that the training of professional accountants;
- Certification of Professional Accountants, based on IFRS;
- Upgrade training and methodological support of education.

However, the reforms in the field of accounting seriously complicated the achievement of goals. Thus, due to the ongoing reform of education, were admitted to the following steps:

- Reduction of 1-year study period (from 5 years up to 4)-This factor may affect the preparation of Accountants (as experience has shown that 5 years
is possible to prepare a suitably qualified accountant, but maybe it will do in 4 years is not yet known);

- The rules set forth in the federal state educational standards of 24.02.2009 are extremely out of place, since the drafting of this standard is carried out within the existing system of services under the state order. In addition, if we compare our GEF standards of European countries, unlike in Europe, in our country, according to this standard, up to 42% of the hours necessary to discipline, which the West did not even study that calls into question the usefulness of both time allocation, allotted to their study and the very necessity of studying them.

Thus, there is a need to adjust the standard with experts in the field of accounting education. Among other things, the very weakness of the standard under consideration is the lack of professional disciplines in the profile of accounting. It should be noted that the whole world is now moving in the opposite direction, namely towards the harmonization of curricula, but according to Russian GEF, curriculum development is the responsibility of each university.

The current, third generation of the standard makes a complete decentralization of the education system. There is no reorientation of contemporary accounting education for in-depth study of IFRS. For example, if a second-generation standard IAS discipline was fixed officially in the curriculum, the third generation of the GEF is absent and the inclusion of this discipline in an educational program given into the hand of the university.

In addition, the new standard could significantly hinder monitoring the quality of educational programs, as there are no standard educational programs.

**Teaching IFRS in Russia:** In USSR accounting had to change in order to suit the needs of centrally planned economy and so did accounting education. During the Soviet times professors kept developing accounting and providing new research to suit needs of the economy. Obviously, having experience of few generations of accountants in the USSR implemented in practice and education, some professors did not want simply to give up certain features of USSR practice.

Since in 1995 the Russian government established a professional body, the Institute of Professional Accountants and Auditors, the process of transition to IFRS began. The role of the Institute was to promote the development of accounting reforms and provide continuous professional development. As part of the role the Institute provided certification of accountants, however, it did not have the same status as professional certification in the West.

In Russia, the number of university students of all forms of education has increased from 3045.7 thousand in the 1980-81 school year to 7064.6 thousand in the 2005-06 academic year. Of these, the number of full-time students increased from 1685.6 thousand to 3508.0 thousand, respectively (Russian Statistical Yearbook, 2006). Since the abolition of the distribution of graduates by companies in Russia began to develop the labor market of young professionals as part of a market economy as a whole. As it was already mentioned, the content of higher education in the Russian Federation is determined by the state in the decision-making procedures (Educational Standard), it does not take into account the interests of particular enterprises, employers and there are no direct links between higher education (the Department) and the sphere of production (the company), which leads to the formation of the gap between the quality of training in universities and professional qualities of knowledge workers necessary for the effective functioning of the enterprise.

The existing over 1,000 universities and HE colleges (including state (approximately 60 percent) and non-state institutions) in Russia are categorized within a broadly hierarchical system as elite, federal, research and classic universities, academies and institutes. The total student population is in the order of 7.5 million, with approximately 800-850 thousand graduates per year [11].

Accounting education in Russia has traditionally been regarded as part of a wider economy studies with emphasis on bookkeeping rather than accounting in its Western approach. The decision to adopt IFRS coincided with several such major changes in accounting education in Russia, as the move from five year ‘specialist degrees’ towards a structure of four year ‘bachelor degrees’ with the option of extending study to six years with a specialist ‘masters degrees’.

As a result, there is no concerted action, "university-enterprise," the graduates at the end of high school, faced with the serious problem of employment. Of the total number of graduates seeking for the employment, the most part was with a degree of "accountant" employment asked for the assistance. Of these, 34.2% were employed, including according to their specialty-15.8% (Russian Statistical Yearbook, 2006). The cause of such situation seems to lie in that there is a high demand for highly qualified accountants with extensive experience and age over 30 years and young graduates who have mostly theoretical knowledge, employers are reluctant to hire.
Table 1: Dependence between the size of the company and the number of employed accountants

<table>
<thead>
<tr>
<th>Size of the enterprise</th>
<th>Total number of employees</th>
<th>The total number of accountants</th>
<th>The av. number of employees per accountant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>&lt;20</td>
<td>1-3</td>
<td>7</td>
</tr>
<tr>
<td>Medium</td>
<td>20-200</td>
<td>5-10</td>
<td>20</td>
</tr>
<tr>
<td>Large</td>
<td>200-1000</td>
<td>10-20</td>
<td>50</td>
</tr>
<tr>
<td>Extra large</td>
<td>&gt;10000</td>
<td>&gt;100</td>
<td>-</td>
</tr>
</tbody>
</table>

Since there is a definite dependence between even the size of the company and the number of employed accountants, one can judge how the demand on the specialists rose to the extent of the growing amount of enterprises (Table 1).

Besides, almost all recruitment companies (i.e., Head Hunter, Job.ru) mention that there is a positive dynamics of labor market in accounting and finance sphere, the dimension between the most popular specialists is the following:

- Accountant-26.7%
- Finance Manager-19.3%
- Finance Director-17.1%
- Chief Accountant-12.5%
- Accountant of the sector-9.7%
- Financial Controller-7.9%
- Auditor-6.8%

But one of the most serious problems in adopting IFRS in Russia lies in the sufficient lack of official Russian translations of IFRS in recent years, most accountants were using unofficial Russian translations of IFRS [12]. There were attempts to develop a new accounting terminology in order to cover accounting concepts not needed during the Soviet era.

Matrix Accounting as a Base for Transition to IFRS: As Russian accounting science has a rich tradition in the development of theoretical and methodological problems, including the development of its various models-graphic, logical-mathematical, linguistic, classification and others, in connection with mechanization and subsequently with computerization of accounting the situational (event driven) nature of accounting is successfully combined with its image by means of matrix algebra and consequently, this can be considered as a prototype of a global mathematical model of accounting. Thus, what is termed "situational-accounting matrix" can be regarded as a prototype of a global mathematical model of accounting. On its basis there is possibility of coordination or (so to say) harmonization of the various points of view caused by features of national and professional accounting systems, as the nature of mathematically proved knowledge is.

But the language of mathematics, as the whole history of development of science shows, provides uniformity of understanding and possesses better categorization tools in logical thinking and inferences than a purely professional specialist language which is close to natural language. That’s why a mathematical model which is independent of any specific accounting content but capable of taking form of any of them, has good prospects in being understood and accepted by specialists worldwide. To expand matrix concept as the basic form of double classification and to distribute it in all accounting systems inspired Richard Mattesich in 1957 [2]. So that some algebraic actions were used for representation of accounting transactions and their reflection in balance sheet matrixes, creating an algebraic basis of accounting.

Looking at the correspondence matrix as at a square matrix E(X,Y) with the dimensions m x m in which the point of crossing of the debit account X and the credit account Y accommodates a unity and all other elements are equal to zero, it can be indicated as E(X,Y) and its non-zero element is always equal to 1 through E_{x,y}=1. In accordance with the definition all its other elements E_{i,k}=0, for all J ≠ X ≠ K ≠ Y.

As well as the entry matrix can be seen as a product of the sum of transaction by a correspondence matrix:

\[ M(X,Y) = S_{op} \cdot E(X,Y) \]  \hspace{1cm} (1)

When multiplying scalar (a numeric value) \( \lambda \) by matrix A all its elements increase by \( \lambda \). When multiplying the sum of the transaction \( S_{op} \) by the correspondence matrix \( E(X,Y) \) the sum of the transaction gets into the point which accommodated a unity and all other elements of entry matrix \( M(X,Y) \) will be equal to zero.

And further, the formula of the Ledger (L) is as follows:
$LM = \sum_{i=1}^{n} S_i \cdot E(X_i, Y_i)$

Where $i$ is the number of the entry in the journal; $S_i$ is the sum of transactions corresponding to entry $i$; $E(X_i, Y_i)$ - a correspondence matrix referring to entry $i$.

The formula of chess balance of the matrix of debit turnovers is obtained from MDT by means of such type of entries will be presented as following:

$MDT = \sum_{X=C_j}^{C_n} \sum_{Y=C_j}^{C_n} S_{X,Y} \cdot E(X, Y)$

Here $S_{X,Y} = \sum_{i_{X,Y}=1}^{n_{X,Y}} S_{i_{X,Y}}$ - the total sum of the entry summary referring to the given correspondence of accounts X,Y. In this case $\sum_{X=C_j}^{C_n} \sum_{Y=C_j}^{C_n} n_{X,Y} = n$, where $n$ - the total number of entries in the journal, that is, the total of $n_{X,Y}$ of similar XY-correspondence accounts is equal to the total number of entries $n$ in the journal.

The formula of the matrix of credit turnovers can be transposed from MDT:

$MCT = MDT' = \sum_{X=C_j}^{C_n} \sum_{Y=C_j}^{C_n} S_{X,Y} \cdot E(X, Y)$

Here $X,Y: = c_1, c_2, \ldots, c_m$ - accounting names or codes, $S_{X,Y} = \sum_{i_{X,Y}=1}^{n_{X,Y}} S_{i_{X,Y}}$ - the total sum of the entry summary referring to the given correspondence accounts X,Y. In this case, $\sum_{X=C_j}^{C_n} \sum_{Y=C_j}^{C_n} n_{X,Y} = n$, where $n$ - the total number of entries in the journal, i.e. the total of groups $n_{X,Y}$ of similar XY-correspondence accounts is exactly the same as the number of entries $n$ in the journal.

The intelligibility of accounting technology presented as transformations of the initial formula of accounting data is provided by three factors:

- The matrix model is valid for all kind of initial data and in any accounting system based on double entry.
- Everything is reduced to familiar mathematical transformations of the initial data which are represented as a formula from the very beginning.
- The formulae and their transformations are easily visible and can be logically reproduced due to uniformity and compactness of mathematical apparatus of matrix algebra.

Concerning the fact that for the large company reporting on IFRS requires 3-5 specialists in this area (staff with the ACCA or CIPA certificate) and taking into account that the number of the companies adopting IFRS increases, it is obvious that in order to meet their needs in Russia, even today there should be more than 7000 staff. Even now there are about 50% of accountants who are aware of IFRS. Besides, the percent of companies that use IFRS is still not very high (not more than 20%). Thus, there is a certain need for IFRS-training among the accountants which will increase in case of the mandatory transition to IFRS. In such circumstances, Russian financial accounting needs can be served in, at least, 5-7 years. That is the time that it will take to bring the IFRS-training in accordance to the existing demand.

REFERENCES


