Using Econometric Tools for Accounting Harmonization Measurement

Razvan V. Mustata, Carmen G. Bonaci, Dumitru Matis, and Jiří Strouhal

Abstract—Paper focuses on emphasizing the manner in which econometric instruments can serve the development of accounting research. While empirical studies are mainly associated with mainstream research, we have chosen to introduce our discussion on the process of globalization and its interrelation with accounting by making reference to critical accounting literature. This approach is also helpful in setting the stage on the development of accounting research. Nevertheless, the positive potentiality of globalization is further exploited within the paper. Introductory thoughts are set on offering an overview on current realities and underline the effects of such a complex process, as globalization. It is therefore shown how the ability to measure accounting harmonization can be helpful from the perspective of a globalized world. The main part of the paper reviews empirical studies in accounting literature in order to document the role econometric tools play in this regard. Summing up, paper starts by following how globalization and accounting interrelate and then document how accounting research, more precisely studies measuring accounting harmonization, and econometric instruments also interrelate in harmony, adding value to scientific knowledge.

Keywords—Accounting harmonization, econometric models, globalization, measurement systems, similarity coefficients.

I. INTRODUCTION

INFORMATION provided by financial reporting plays a crucial part on the arena of international financial sector. The current financial crisis makes us reconsider the entire decision making process in financial areas at different levels.

There is no further need to argue for the role of accounting information in launching the mechanisms of capital markets, but for the impact of accounting regulations on the outcome of financial reporting. Explaining the accounting practices in one country requires a double entendre analysis. The basic part refers to accounting practices being determined by accounting regulations. Formal harmonization holds its merits through the property of a priori analysis to produce results on hypothetical reporting alternatives before the implementation and therefore offering support to standard setting bodies and national regulatory bodies.

Accounting regulations strongly influencing the outcome of financial reporting, and then, it is this outcome that determines the reaction of players on the capital markets.

Players' reaction within the capital market often leads to financial engineering that must activate the reaction of standard setting bodies, which will respond through the tool of accounting regulations. Therefore, the circle is reengaged. The reaction of players on the capital market and their financial engineering determine the investors' behavior, whereas the reaction of standard setting bodies and accounting regulations are part of the accounting regulatory process. The outcome of financial reporting is also influenced by the accounting profession [29] and accounting practices [28]. The investors' behaviour, the accounting regulatory process, the accounting profession, and accounting practices are all influenced by one country's history, culture, political, and economic environment.

Numerous researches deal with information potential of measurement and accounting. Information systems are to assure enough information and transfer it according to a company's need, in relation to a company organization structure [34]. Knowledge is a fluid mix of framed experience, values, contextual information, expert insight and grounded intuition [19]. One portion supports day-to-day decision making; another part is used for tactical and strategically decision making [39].

According to the above mentioned reasons there are developed studies focused on international accounting harmonization. This paper deals with use of econometric tools for measurement this harmonization.

Globalization is defined by previous studies through a large variety of approaches, from simple views that consider it to represent "the extension of social relations over the globe" [20] and "economic processes of internationalization", global referring to "the expansion of trade and commerce between countries" [18]. The later approach is very similar to [15] definition referring to "large and growing flows of trade and

Razvan V. Mustata is with Babes-Bolyai University Cluj Napoca, Department of Accounting, T. Mihali 58-60, Cluj Napoca, Romania <email: razvan.mustata@econ.ubbcluj.ro>.

Carmen G. Bonaci is with Babes-Bolyai University Cluj Napoca, Department of Accounting, T. Mihali 58-60, Cluj Napoca, Romania <email: carmen.bonaci@econ.ubbcluj.ro>.

Dumitru Matis is with Babes-Bolyai University Cluj Napoca, Department of Accounting, T.Mihali 58-60, Cluj Napoca, Romania.

Jiří Strouhal is with University of Economics Prague, Department of Financial Accounting and Auditing, W. Churchill Square 4, 130 67 Prague 3, Czech Republic <email: Strouhal@vse.cz>.

capital investment between countries". More elaborate versions define globalization as "the widening, deepening and speeding of worldwide interconnectedness in all aspects of contemporary social life, from the cultural to the criminal, the financial to the spiritual" [13] and "an inherently temporal process whose history—arguably a very long one [16]—either puts at risk, or requires specification of, any claim to novelty" [25].

[10] documents that globalization in effect equates to the governance of a problematic hegemony and shapes a context witness to related problematic processes and outcomes. All approaches and definitions arising during history in order to better characterize the process of globalization point its interdisciplinary coverage. [25] acknowledge how [13] documented the expansion beyond the national and regional levels of governance mechanisms, trade, markets, financial flows, production networks, migration, organized violence and environmental degradation, in conjunction with "a series of decisive shifts in the geographical scale, immediacy and speed of cultural interaction and communication" [13].

While globalization processes have not been found to act uniform or unidirectional, both when considering space and time dimensions, [13] still provide convincing evidence of a tendency towards a "thick globalization" taking place during the last half of century. The authors document this tendency as being characterized by high extensity, intensity, velocity and impact. [25] presents extensity, intensity, velocity and impact as "dimensions along which to track how what happens there affects what happens here, and vice versa". The dynamic of the interaction then becomes complicated because in some circumstances we might think about analyzing here and there in conjunction, as forming a global object of analysis. Furthermore we inevitably ask ourselves exactly what kind of object have we formed, the relation between the components of our new object most surely becoming problematic.

A fair list of globalization's negatives can easily be found in critical accounting research and includes: economic re-structuring and volatility, for some meaning increased poverty, social inequality, job and pension loss; facilitation of massive frauds; possibility of developing elaborate tax avoidance schemes generating a retreat from progressive taxation and welfare statism; global trade regimes working against the poor in poor countries, therefore enhancing the rich-poor divides; and posing threats to traditional cultures. Increased global ecological awareness is also considered by some to have increased insecurity, while increased economic activity and re-structuring can contribute pollution and exert some downward pressure on environmental as well as social standards [10]. Smaller nation state can become constrained by global capital flows, economic and systemic interdependency and the power of big business.

[10] on one hand summarize what are commonly understood as negative dimensions of globalization, which they see as a political, economic, technological and cultural process, characterized by the growth and spread of suprastatism, supranationalism or supraterritoriality [10]. On the other hand, they acknowledge that globalization is a dialectical context, a context of tension and contradiction, wherein lies much of its positive potentiality. Therefore, some critical researchers take globalization positively by accepting the fact that within its developments and context there is also potential for progressive and emancipatory change.

As [25] was noting, the word "globalization" or its derivatives are for some time now being used when approaching broad topic areas including: the academy and pedagogy; post-modernism; capital markets; the critical accounting project itself; transfer-pricing; the future and nature of work; privatization and the public sector; the accounting profession; and accounting practice. Analyzing accounting in relation to globalization makes it possible for us to asses to what extent does globalization allow, facilitate, call and engender the need for an emancipatory and enabling accounting [10].

A full understanding of how the research on capital markets has developed in time requires a temporal contextualization of the various theories of accounting. Thus, early studies on the accounting of capital markets can be traced back to the end of the '60s, immediately after the development of the efficient markets hypothesis and event study methodology. Developments that took place simultaneously in the field of economy and finances have been a theoretical and methodological stimulus for the first manifestations of research that focused on capital markets.

While the efficient markets hypothesis and the current accounting positivism facilitated the emergence of research on capital markets at the end of '60, theoretical models analyzing the inefficiency of markets, the development of research methodology and evidence of apparent market inefficiency, can be considered responsible for their catalytic action on a good part of the studies developed at present time.

A further development in research on capital markets were "association studies" that tested a positive correlation between performance values expressed by accounting values (earnings or cash flows) and the return rate of the given by the securities market, both measured for relatively long periods in time.

In this paper we concentrated on analyzing the genesis and the factors that led to the formation of a significant segment of trade literature, and on the classification and presentation of the main types of studies considered to be research on capital markets. However, we can notice the dominance of studies that focus on American capital market, which does not surprise us, having in mind its development and the availability of resources for American universities. Furthermore, tests developed as a continuity of the assumed scientific approach, will show that many aspects of financial accounting tools have their starting point in the American accounting referential. Regarding the current state of literature, [8] support our previous assertions, showing that despite the fact that Europe offers a unique area of research through the diversity of its economic, cultural, and legal background, studies on European

capital markets are mostly an imitation of the research already conducted in the U.S., using European data. The problem is that most of this research does not start from an analysis of the applicability and relevance of the specific methodologies and assumptions used in the unique European context.

Some current reactions make us think about the past, the Enron collapse inevitably coming to our thoughts. At that time, the new fair value accounting paradigm was progressively incorporated into the framework of Generally Accepted Accounting Principles to serve along with the well-established historical-cost accounting, but, as today, the Enron debacle involved misuses of both paradigms. Then was also an opportunity to argue against "mark-to-model" valuation, and even more to suggest the time of fair value accounting had not yet come [2]. Enron used, to a large extent, level 3 and level 2 inputs for its external and internal reporting. Level 3 valuation was first used for energy contracts, then for trading activities generally and undertakings designated as "merchant'" investments, these fair values simultaneous being used to evaluate and compensate senior employees. As proven later, Enron's accountants (with Andersen's approval) used accounting devices to report cash flow from operations rather than financing and to otherwise cover up fair-value overstatements and losses on projects undertaken by managers whose compensation was based on fair values [3].

The Enron case was a widely debated topic, a large number of analyses being performed on it within trade literature, but results did not find the concept of fair value as culprit. Moreover, it was shown that the lack of well designed and effective, adequate control systems produced opportunities for the abuse and manipulation of fair value accounting. Even under this particular case, the obvious advantage of value relevance information offered by fair value accounting is recognized, but argued that the development of a hybrid accounting system in which historical cost accounting and fair value accounting are used simultaneously distorts the coherency of the reporting system, increases potential income management and "window dressing", and nullifies the effectiveness of the existing control systems. Criticism for the mixed attribute is often met within trade literature [12], but it does not eliminate the merits of fair value accounting. We dare to say that it actually emphasizes the necessity of correctly approaching fair value with all its underpinnings, and suggests it is imperative to be properly implemented in order to function as conceived, this involving also control systems and audit standards issues.

A first reaction to the current financial crisis is once again to blame the fair value, which in its essence is just a simple messenger of the crisis, the causes being others. Indeed it is easy to say that at the basis of a fair value that would have had suffered an artificial increase of the real estate prices, some banks or financial institution would have offered furthermore more and more flexible mortgage credits, meanwhile others would have invested in toxic assets such as CDOs from the same considerate, the guarantee behind this being the same

real estate assets extremely over valued. It is hard to believe that within such a complex system, the incognizance can be as so great that there wouldn't exist responsible parts for the events that happened, other than the fair value, which, hard to believe, after so many decades of elaboration as a concept, could be the basis of the actual crisis.

II. Trends in Accounting Harmonization Research

The accelerating pace of globalization also led to the appearance of a significant number of free-market global accounting institutions, while analyzing the demand for international accounting regulation still brings difficulties. [17] urges researchers to consider international accounting with all its implicit processes and impacts. The free market international accounting reform can be looked at as part of a problematic globalization process. [18] goes further and challenges international accounting research to focus on accounting impacts which are associated with governance and harmonization processes. The dominant model of harmonizing international accounting is considered to be based on decision-usefulness accounting assumptions. Therefore, entities should be able to continue their operations if they achieve efficient and effective outcomes [18, 24, 38].

Critical accounting nevertheless brings its own vision on how it might help the understanding of accounting harmonization, its dynamics and processes. It is brought to our attention that international accounting can be characterized by a very skilful orchestration of the world-wide lobbying pressures of the audit industry that have the power to control agendas and create technologies of control [17]. [10] also worry over the fact that in the context of the universalistic forces shaping corporate accounting, even the alternative corporate social accounting being strongly promoted through the UN's Global Reporting Initiative (GRI) and the Institute of Social and Ethical Accountability's (ISEA's) global initiatives can be influenced by the problematic mainstream.

Coming back to posing the accent on the positive, critical accounting researchers come to conclude that the accounting harmonization process has the ability to facilitate more progressive global democratic governance [4, 10, 17]. Those questions being raised in order to clarify the global object of analysis, this being created through the accounting harmonization process as a result of the interactions taking place, ironically generate significant concerns on valued differences.

If we are to further focus on the literature dealing with accounting harmonization we must make reference to [23] who showed that starting with the mature period (1990-2004, according to [21]) in the development of this category of studies, two major groups of researches can be observed. One would focus particularly on analyzing the international accounting harmonization process, while the other on measuring the harmonization degree. It is the first group that better suits the above discussed type of research, raising a series of questions that have revelatory power. Meanwhile,

results being obtained through those studies that aim at measuring accounting harmonization must also be interpreted and analyzed within a more complex setting that considers all implicit processes and impacts.

After searching for positive potentiality of globalization when it comes to accounting, our paper continues by focusing on that group of studies that measure accounting harmonization, this time looking at accounting research in relation to econometric instruments. It is these instruments that make it possible for accounting researchers to quantify a series of aspects involved within the analyzed processes, therefore allowing further interpretation and integration within the context. It is our opinion that the manner in which econometric instruments are being used as research tools is significantly important for the results to be obtained. That is why our paper reviews previous studies that measure accounting harmonization, focusing on the instruments being used, their advantages and disadvantages, shortcomings, as well as their explanatory power.

III. MEASURING ACCOUNTING HARMONIZATION

International accounting harmonization must be looked at from two distinctive perspectives when referring to implementation aspects. The first one relates to accounting regulations, and the second one to accounting practices and financial reporting practices. From an historical point of view we notice that measuring accounting harmonization was in its beginnings done by using different systems. Nowadays making a clear distinction of systems being used in current research is no longer possible. Preoccupations for quantifying the compatibility degree between accounting systems were first oriented towards accounting practices. Nevertheless, accounting regulation gradually gain significant ground in the area of accounting harmonization studies.

A. Measurement Instruments Based on Measuring Options' Concentration

Among the first instruments measuring compatibility of accounting practices we must mention the indicators being used by [35, 36, 37]. These indicators have been developed due to descriptive statistics' and comparative analysis' incapacity to provide relevant information on the compatibility degree between different accounting systems, both from a time and space perspective [21, 30]. The new measurement systems are based on the concentration of options regarding accounting practices and come to contribute to the development of research measuring accounting harmonization, being started through studies such as [7, 22].

Therefore, van der Tas started this scientific demarche by using a first indicator that was called H Index (Herfindahl Index), whose purpose was to be used in measuring the harmonization degree of a certain national accounting system. Van der Tas further developed two derivatives of this indicator [35, 36, 37]. The first one is the C Index that can be used in order to quantify the harmonization degree within a country having more than one financial reporting system. If the existent

two indicators were analyzing accounting systems' national dimension, the second derivative from the H Index offers the possibility to quantify accounting practices' harmonization degree between two or more national accounting systems. Therefore, through I Index measuring accounting harmonization receives international dimensions.

H Index is based on two distinctive elements. The first one is the frequency of using a certain accounting method or option, being quantified through the number of entities opting for a certain accounting treatment. The second element is relative frequency of accounting options, being obtained by dividing the number of entities applying a certain accounting treatment to the whole number of entities within the considered sample [35]. The computation formula for H Index can be developed as follows:

$$H = \sum_{i=1}^{n} p_i^2 \quad (1)$$

where H is Herfindahl Index, n the number of alternative accounting methods and pi the relative frequency of method i.

H Index can record values from 1/n to 1, while changes of its value can be interpreted as an evolution, positive or negative, in the harmonization degree. The usefulness of this indicator is limited through the fact that it can be applied when there is a concentration of accounting treatments around one or around a limited number of possible options. Determining the significance degree of changes taking place in the therefore measured accounting harmonization is also difficult [33]. Another limit in using the H Index is that in does not allow the analysis of multiple financial reporting or of that offering supplementary information through the notes to the financial statements [21].

In order to respond to H Index's limitation and to obtain more information regarding the level of accounting harmonization at a certain moment in time, van der Tas [36] develops the C Index.

Through this indicator it is proven that there is a direct association between accounting practices' harmonization degree and their compatibility degree. This is also due to the fact that C Index has the ability of simultaneously considering more accounting and financial reporting systems that might be used at a certain time within an entity. Moreover, C Index offers the possibility of calculating the significance of changes taking place in the level of harmonization, based on relevant test of significance.

Starting with a clear example, van der Tas [36] established the final form of this indicator as follows:

$$C = \frac{\sum_{t=1}^{m} a_t^2 - n}{n^2 - n} \quad (2)$$

where C is C Index, m the number of alternative accounting methods, n the number of considered financial reporting and at the number of entities applying the t accounting method.

Based on this computation formula we can asses that

changes recorded in the level of harmonization are associated with changes in the number of entities applying the same accounting treatment. This is also valid when the number of accounting treatments stays the same or modifies.

The main shortcoming of these two indicators is their exclusive national dimension when it comes to their implementation. This limit is solved through the development of the third indicator, the I Index [35].

The computation formula for this index is [14]:

$$I = \left[\sum_{m=1}^{M} \left(\prod_{n=1}^{N} p_{m.n} \right) \right]^{1/N-1} \quad (3)$$

where I is I Index, m the number of alternative accounting methods, n the country number, pm.n the relative frequency of method m's use within country n.

When more than two national accounting systems or countries are being considered for analysis using the I Index (3) we must include a correction factor, namely (1/n-1) as exponent within the previous computation formula.

B. Measurement Instruments Based on Measuring the Distance

The above presented category of measurement instruments is based on an approach that involves two accounting systems that record a high degree of harmonization, a high number of entities applying a certain accounting method or treatment. Implicitly, this category of measurement instruments explicitly refers to accounting practice.

Forming a distinctive dimension of international accounting harmonization, accounting regulation became a significant source of data and information for studies measuring the compatibility degree between accounting policies and systems. The roots of this type of research are based on the concept or philosophy of distance between elements being considered at a certain moment.

The first studies being developed in this particular research area have their econometric grounding in two distinctive methods: the Mahalanobis Distance Method [26, 27] and the Euclidian Distances [9, 11]. The study developed by [26] is the first scientific demarche to be using an accounting harmonization measurement instrument that is based on the philosophy of distance between considered elements. On the other hand, Euclidian Distances represent a particular form of the Mahalanobis Distance Method.

Moreover, [11] was the first to use this instrument for measuring accounting harmonization in order to quantify the harmonization degree between distinctive sets of accounting regulation. From a conceptual point of view, the Euclidian Distance between two points X and Y, having the coordinates X = (x1, x2, x3, ..., xk) and Y= (y1, y2, y3, ..., yk) it is defined as follows [9]:

$$D(X,Y) = [\sum_{k=1}^{p} (x_k - y_k)^2]^{1/2} \quad (4)$$

where: in the considered pattern, xk represents the analyzed

value of the variable k for the element x; and k may take values from 1 to p (where p is the number of order of the characteristic attribute attached to the analyzed element)

If we are to particularize this computation formula in the field of accounting by also using the study developed by [9], the Euclidian Distance is better suited by the following computation formula:

$$D_m^{ID/ND} = \sum_{i=1}^{n} d_{k,m}^{ID/ND} \quad (5)$$

where: $D_m^{ID/ND}$ = represents the harmony degree between ID and ND periods, m = represents the analyzed period (international periods and national periods), k = the four categories of features characteristic to the considered accounting methods and treatments, n = the number of accounting elements being considered within the pattern.

Euclidian Distances can record values from infinite to zero, therefore lacking a maximum possible value in certain circumstances. The zero value of this indicator represents the existence of the same number of accounting methods or treatments within both considered sets of accounting regulation. Therefore, the lower the ED value the highest is the degree of harmonization between the two sets of accounting regulation [11]. Moreover, a decrease in ED's value from one period to another reflects an increase of the compatibility degree between the two considered sets of accounting regulation.

C. Measurement Instruments Based on Measuring the Similitude Degree

The main problem in using measurement instruments based on measuring the distance between the considered elements is that in only considers quantitative aspects without considering the qualitative dimension of accounting harmonization. Therefore, the Euclidian Distance does not consider which accounting treatment or method is adopted at one moment in time, while also neglecting its character [9]. Even if [11] considered this instrument as being suitable in order to measure accounting harmonization, following studies [6, 9] have appealed to using association coefficients in order to determine the similitude degree between two distinctive sets of accounting regulation.

After a series of studies trying to measure accounting harmonization based on the indicators that were developed by van der Tas [35, 36, 37], it was naturally to feel the need of using other instruments that were capable of eliminating or at least diminishing previous limitations and shortcomings. The main problem being identified for the previously discussed indicators is the lack of some associated robustness tests, as well as of a confidence interval for the obtained results [21]. Actually, through the studies developed by [1, 5, 26, 27, 32] we witness the movement to using the correlation and association coefficients in measuring the degree of accounting harmonization.

Moving forward we can observe that instruments measuring the compatibility degree of accounting practices and of different sets of accounting regulation actually record a convergent time evolution towards the common point given through measurement instruments based on similarity. Moreover, a clearer dimensioning of the accounting harmonization degree is obtained when using either association coefficients (Jaccard's Coefficients), either correlation coefficients (Pearson Coefficient, Spearman Coefficient).

Jaccard's Coefficients are mostly known in the form being used by [9], as follows:

$$Sij = \frac{a}{a+b+c} \qquad (6)$$

and

$$D_{ij} = \frac{(b+c)}{(a+b+c)} \qquad (7)$$

where: Sij represents the similarity degree between the two sets of analyzed accounting regulations or practices; Dij represents the degree of dissimilitude or diversity between the two sets of analyzed accounting regulations or practices; a – the number of elements which take the 1 value for both sets of regulations or practices; b – the number of elements which take the 1 value within the j set of regulations or practices and the 0 value for the i set of regulations or practices; c – the number of elements which take the 1 value within the i set of regulations or practices and the 0 value for the j set of regulations or practices.

The values that can be recorded by these coefficients go from 0 to 1, where 1 represents a maximum level of harmonization when considering the similarity coefficient. Also, the sum of the two Jaccard's Coefficients, Jaccard Sij and Dij, is obviously always equal to 1.

As for the correlation coefficients, the study developed by [9] appealed to using Spearman's coefficient in order to dimension the comparability degree between a set of national accounting regulation and International Financial Reporting Standards. The corresponding computation formula is as follows:

$$rs = \frac{\sum_{i=1}^{n} R(NC_i)R(IC_i) - n((n+1)/2)^2}{\left(\sum_{i=1}^{n} R(NC_i)^2 - n((n+1)/2)^2\right)^{1/2} \left(\sum_{i=1}^{n} R(IC_i)^2 - n((n+1)/2)^2\right)^{1/2}} \qquad (8)$$

where: n = total number of accounting methods included in the study; R(NCi) = the rank of the accounting method i within national accounting standards (NC), i = 1, ..., n; R(ICi) = the rank of the accounting method i within international accounting standards (IC), i = 1, ..., n.

Being used in the field of accounting, Spearman's coefficient can record values going from -1 to +1. The closest the value of the coefficient to +1 the higher is the harmonization degree between the considered elements.

IV. CONCLUSION

If we are to conclude upon the above presented statistical indicators we can underline the fact that instruments being used in measuring accounting harmonization have known a continuous development in time, from simple to complex, but meanwhile on convergent directions. Each new approach of these measurement instruments brings innovative elements that are meant to respond to the shortcomings of previous instruments. Maintaining this trend, current researches [28, 29, 30, 31] have been using derivative forms of the above discussed indicators. Such an example would be Taplin's [31] computation formula for the H Index:

$$E(H) = \sum_{i=1}^{n} \pi_i^2 + \sum_{i=1}^{n} \pi_i(1 - \pi_i)/n \qquad (9)$$

where: E = estimation operator; n = number of accounting options; π_i = relative frequency of accounting options within the population of elements being analyzed

This manner of implementation of the H Index is different from those being used by van der Tas [35, 36, 37] because it represents a situation of implementing the index from a different space dimension, while the first approach considered the time dimension [21].

When it comes to using instruments based on measuring the distance, namely the Euclidian Distance, literature appealed to formulating a new instrument called the ED Index [21]. This instrument is related to the Euclidian Distance and allows comparisons between successive temporal measurements even if the number of considered elements changes from one observation moment to another. Previous studies using Euclidian Distance only allowed temporal comparisons if the number of considered elements was constant from one period to another [9, 11, 26, 27]. The computation formula for the ED Index is as follows:

$$EDIndex = \frac{EDValue}{n} \qquad (10)$$

where: ED Index = Euclidian Distance Index; ED Value = the absolute value of Euclidian Distance; n = the number of elements considered to determine the absolute value of Euclidian Distance.

One of the limits in using Jaccard's coefficients is that it does not consider those situations when an accounting treatment or method is absent from both sets of considered accounting regulation or is present in both, but its practical implementation is not a possibility. This shortcoming is taken care of by using Sokal and Sneath's Coefficients. In other words, using the later coefficients considers conjoint absence and presence of a particular accounting method or treatment. The computation formula this time looks as follows:

$$SS_{ij} = \frac{2(a+d)}{2(a+d)+b+c} \qquad (11)$$

where: SSij represents the similarity degree between the two sets of analyzed accounting standards (according with Sokal and Sneath's Coefficients); a – the number of elements which take the 1 value for both sets of accounting regulations or

practices; b – the number of elements which take the 1 value within the j set of accounting regulations or practices and the 0 value for the i set of accounting regulations or practices; c – the number of elements which take the 1 value within the i set of accounting regulations or practices and the 0 value for the j set of accounting regulations or practices; d – the number of elements which take the 0 value within the i set of accounting regulations or practices and the 0 value for the j set of accounting regulations or practices.

Unlike in the case of Jaccard's coefficients, the new appeared element "d" is used precisely in order to quantify conjoint absence and presence of a particular accounting method or treatment. In addition, conjoint absence and presence are double weighted.

As previously mentioned within our paper, using econometric instruments in order to measure accounting harmonization presents potentiality and should generate benefits as long as obtained results are correspondingly grounded and further correlated and integrated with other dimensions characterizing the global accounting environment as well as the diversity of accounting systems.

REFERENCES

[1]   S. Aisbitt, Assessing the Effect of the Transition to IFRS on Equity: The Case of the FTSE 100, *Accounting in Europe*, Vol. 3, No. 1, 2006, pp. 117–133.

[2]   B. Barlev, and J.R. Haddad, Dual Accounting and the Enron Control Crisis, *Journal of Accounting, Auditing and Finance*, Vol. 19, No. 3, 2004, pp. 343-359.

[3]   G.J. Benston, The shortcomings of fair-value accounting described in SFAS 157, *Journal of Accounting and Public Policy*, No. 27, 2008, pp. 101-114.

[4]   C. Calhoun, *Critical social theory: culture, history and the challenge of difference*, Oxford: Blackwell, 1996.

[5]   P. Delvaille, G. Ebbers, and C. Saccon, International Financial Reporting Convergence: Evidence from Three Continental European Countries, *Accounting in Europe*, Vol. 2, No. 1, 2005, pp. 137–164

[6]   Y. Ding, O.K. Hope, T. Jeanjean, and H. Stolowy, Differences between Domestic Accounting Standards and IAS: Measurement, Determinants and Implications, *Journal of Accounting and Public Policy*, Vol. 26, No. 1, 2007, pp. 1–38.

[7]   T.S. Doupnik, and M.E. Taylor, An Empirical Investigation of the Observance of IASC Standards in Western Europe, *Management International Review*, Vol. 25, 1985, pp. 27–33.

[8]   P. Dumontier, and B. Raffournier, Accounting and capital markets: A survey of the European evidence, *European Accounting Review*, Vol. 11, No. 1, 2002, pp. 119-151.

[9]   A. Fontes, L.L. Rodrigues, and R. Craig, Measuring Convergence of National Accounting Standards with International Financial Reporting Standards, *Accounting Forum*, Vol. 29, No. 4, 2005, pp. 415–436.

[10] S. Gallhofer, and J. Haslam, The accounting–globalisation interrelation: An overview with some reflections on the neglected dimension of emancipatory potentiality, *Critical Perspectives on Accounting*, Vol. 17, No. 4, 2006, pp. 903–934.

[11] P. Garrido, A. Leon, and A. Zorio, Measurement of Formal Harmonization Progress: The IASC Experience, *The International Journal of Accounting*, Vol. 37, No. 1, 2002, pp. 1–26.

[12] F. Gigler, C. Kanodia, and R. Venugopalan, Assessing the information content of mark-to-market accounting with mixed attributes: The case of cash flow hedges, *Journal of Accounting Research*, Vol. 45, No. 2, pp. 257-276.

[13] D. Held, A. McGrew, D. Goldblatt, and J. Perraton, *Global transformations*. Cambridge, Polity Press, 1999.

[14] D. Herrmann, and W. Thomas, Harmonization of Accounting Measurement Practices in the European Community, *Accounting and Business Research*, Vol. 25, No. 100, 1995, pp. 253–265.

[15] P. Hirst, and G. Thomson, *Globalisation in question*, Cambridge: Polity Press, 1996.

[16] A.G. Hopkins (ed.), *Globalization in world history*, London: Pimlico, 2002.

[17] A.J. Hopwood, Some reflections on the harmonization of accounting within the EU, *European Accounting Review*, Vol. 3, No. 2, , 1994, pp. 241–253.

[18] G. Lehman, A critical perspective on the harmonization of accounting in a globalising world, *Critical Perspectives on Accounting*, Vol. 16, No. 5, 2005, pp. 975–992.

[19] Li Yuhua, B.A. Zuhair, and M. David, An Approach for Measuring Semantic Similarity between Words using Multiple Information Sources, *WSEAS Transactions on Knowledge and Data Engineering*, Vol. 15, No. 4, 2003, pp. 871-882.

[20] M. Mann, Globalisation and September 11, *New left review 12*, Nov/Dec, 2001, pp. 51–72.

[21] R.V. Mustata, and D. Matis, Systems for material harmonization measurement within the changing global accounting environment: a review, *Journal of Organisational Transformation and Social Change*, Vol. 7, No. 1, 2010, pp. 47–87.

[22] R.D. Nair, and W.G. Frank, The Harmonization of International Accounting Standards: 1973–1979, *The International Journal of Accounting*, Vol. 17, No. 1, 1981, pp. 61–77.

[23] C. Nobes, On accounting classification and the international harmonization debate, *Accounting, Organisations and Society*, Vol. 29, No. 1, 2004, pp. 189-200.

[24] T. Peter, and M. Waterman, *In search of excellence: lessons from America's best run companies*, Sydney: Harper and Rowe, 1984.

[25] C. Poullaos, Globalisation, accounting critique and the university, *Critical Perspectives on Accounting*, Vol. 15, No. 4, 2004, pp. 715–730.

[26] A.R. Rahman, H. Perera, and S. Ganesh, Accounting Practice Harmony, Accounting Regulation and Firm Characteristics, *Abacus*, Vol. 38, No. 1, 2002, pp. 46–77.

[27] A.R. Rahman, H. Perera, and G. Tower, Accounting Harmonization between Australia and New Zealand: Towards a Regulatory Union, *International Journal of Accounting*, Vol. 29, No. 3, 1996, pp. 316–333.

[28] J. Strouhal, C. Bonaci, D. Matis, and R.V. Mustata, Failure of Measurement System? Some Lesson from Fall of Enron Corp, *WSEAS Transactions on Systems*, Vol. 9, No. 9, 2010, pp. 969-978.

[29] J. Strouhal, and K. Kallaste, Accounting Professional Education Schemes: Case of Czech Republic and Estonia, *WSEAS Transactions on Communication*, Vol. 9, No. 8, 2010, pp. 485-494.

[30] J. Strouhal, L. Mullerova, Z. Cardova, and M. Pasekova, National and international financial reporting rules: Testing the compatibility of Czech reporting from the SMEs perspective, *WSEAS Transactions on Business and Economics*, Vol. 6, No. 12, 2009, pp. 620-629.

[31] R. Taplin, Harmony, statistical inference with the Herfindahl H Index and C Index, *Abacus*, Vol. 39, No. 1, 2003, pp. 82-94.

[32] A. Tarca, International Convergence of Accounting Practices: Choosing between IAS and US GAAP, *Journal of International Financial Management and Accounting*, Vol. 15, No. 1, 2004, pp. 60–75.

[33] J.S.W. Tay, and R.H. Parker, Measuring International Harmonization and Standardization, *Abacus*, Vol. 26, No. 1, 1990, pp. 71–88.

[34] Z. Tuckova, and J. Strouhal, Knowledge-Intensive Services: New Leader of Production Stages? *WSEAS Transactions on Systems*, Vol. 9, No. 4, 2010, pp. 432-441.

[35] L.G. Van der Tas, Measuring Harmonization of Financial Reporting Practice, *Accounting and Business Research*, Vol. 18, No. 70, 1988, pp. 157–169.

[36] L.G. Van der Tas, Evidence of EC Financial Reporting Practice Harmonization: The Case of Deferred Taxation, *European Accounting Review*, Vol. 1, No. 1, 1992a, pp. 69–104.

[37] L.G. Van der Tas, Measuring International Harmonization and Standardization: A Comment, *Abacus*, Vol. 28, No. 2, 1992b, pp. 211–216.

[38] R.L. Watts, and J.L. Zimmerman, *Positive accounting theory*, EngelsWoods Cliff, NJ: Prentice-Hall, 1986.

[39] Yu Chang-Rui, and Luo Yan, Research on Models of Decision-Making Problem Recognition, *WSEAS Transactions on Business and Economics*, Vol. 5, No. 5, 2008, pp. 37-43.

Razvan V. Mustata (Ph.D.) is lecturer of Department of Accounting of Babes-Bolyai University Cluj Napoca, Romania. His major is international accounting harmonization and critical accounting. He also acts as invited co-editor of International Journal of Critical Accounting.

Carmen G. Bonaci (Ph.D.) is lecturer of Department of Accounting of Babes-Bolyai University Cluj Napoca, Romania. Her major is international accounting harmonization partially focused on reporting for financial securities.

Dumitru Matis (Prof., Ph.D.) is professor of Department of Accounting of Babes-Bolyai University Cluj Napoca, Romania. His major is corporate financial accounting. He also acted as a scientific committee member for the EUROPMENT conference EMT 2010 in Timisoara.

Jiří Strouhal (Ph.D.) is senior lecturer of the University of Economics Prague, Czech Republic. His major is international accounting harmonization mainly focused on financial instruments reporting and SMEs reporting. He acted as associate editor of the EMT 2010 Timisoara EUROPMENT conference proceedings. Currently he is an acting vice-president of Chamber of Certified Accountants Czech Republic.