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DETECTING ORGANIZATION CAPITAL THROUGH ACCOUNTING INFORMATION. DIFFERENCES BY COUNTRY EDUCATION

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Resumen

There are firms that have unusual economic growth compared to similar firms in the same sector with the same resources such as human and physical capital. Organization capital as element of intangibles asset may explain this abnormal performance as a source of competitive advantage. A measure of organization capital was applied to United States but we propose that there are differences among countries that affects its value by educational variables. This measure is contrasted and corroborated by future performance for several countries and compared with a set of countries with different level of educative. The results suggest that exist different performance of organization capital among countries and can be related to different educative level.

1 INTRODUCTION

There are several studies trying to explain why there are some firms that have unusual economic growth compared to other firms involved in the very same context such as, Lev, Radhakrishnan and Zhang (2009), Grant (2000), Barney (1991), Andreou et al (2007), Hall, (1992). This research explores this scope by a recent field called intangible assets that may explain part if this expected answer.

The source of value is not the production but the intangibles assets creation and manipulation as Cohen and Levinthal (1989) argued in a previous study. Nowadays, intangible variables are considered in some income statement reflecting a particular measurement. Among those variables that are observable and some other that provides direct profit; it can be found some assets that are not measured at all. Lev (2001) classifies in four groups the intangibles in discovery/learning, costumer-related, human-resource and organization capital. There are some methods to measure some of these intangible components as technology, know how, patents, R&D, brands, trademarks, training.

Organization capital is one part of the intangibles assets that are not fully described yet. Lev (2001) states that organization capital can achieve efficiency and exceed the value creation from physical assets; organization capital enables superior operating, investment and innovation performance, represented by the agglomeration of technologies, business practices, processes and designs. Lev, Radhakrishnan and Zhang (2009) improved an organization capital measure from a previous work and capture its value in United States industrial sectors.

Certain value of organization capital prevails en every firm, but there is a possibility that exist a different relation depending on the geographic area. Countries with superior educative level may explain the value of organization capital because of accounting parameters are described well than in those countries where level of education is deficient.

This research proposes to contrast for several countries, the validity of the organization capital measure developed by Lev et al (2009) through their relationship with future performance. We propose that there are differences among countries that can be explained by educative variables.

In economics there is a field that studies the issues related to the academic area called education economics. The model dominant for education is based on human capital theory; where the central idea is that investment in the acquisition of skills and knowledge will increase earnings, or might provide long-term benefits (Checchi, 2006). Mudambi (2008) proposed that it may exist an intangible geography were there are some areas specialized in this topic. Education might be an engine of growth that can rely on the quantity, quality and expenditure of education in any country.

The structure of this research will be as follows: In the first part a general background of intangibles assets and organization capital is presented, as well as the influence of differences education among countries are explained. The second part contains the main hypothesis with their subsequent actions. In the third section, a general research design is described. In the fourth section organization capital measure is corroborated in 13 countries with the subsequent relationship with future performance over three years with an univariate and multivariate analysis; on the other hand, country classification analysis by educative level is done with factorial and cluster analysis were different groups are created, it is corroborated differences in countries with dissimilar attendance rates to school and expenditure on education. Finally, conclusion is included in the last section.

2 BACKGROUD

2.1 INTANGIBLES AND ORGANIZATION CAPITAL

It is feasible to recognize firms that have abnormal performance through the sales, size and amount of assets among other economic indicators. But it is not so clear in the literature how to measure the difference between the value of some firms that are in the same sector with similar characteristics but with different performance. According to Lev et al (2009), companies have been increasing their investments in innovation due the globalization that one process/product can be easily transmitted from one place in the world to another almost immediately. Also deregulation in several countries has been growing; there is an open door to experiment on new procedures due the opened barriers. On the other hand, technological changes allow improving almost every possible way to get better options to develop a firm. Lev (2001) states that intangibles are the primary driver of the supply of innovation, this has brought intangibles to the centre stage in the real world business.

The economic development based in knowledge caused that firms create value; intangible assets have been studied for the last 30 years. In the 80's became essential the creation of intangible industries (software, internet, communication services, etc.) having a recent development in the last decade according to Lev (2001), Lev et al (2009), Cañibano et al (2000). Therefore, it is required to study the existing implications in the intangibles even if there is some confusion at measuring; in this sense an effective measurement can explain a significant effect of the intangibles on the firm performance. In this project it is emphasized that companies investing in intangible assets will have better results, as Galbreath (2005) pointed out before. Tangible sources such as fixed and working capital become less important to the firm in terms of their contribution to the value added and as a basis for competitive advantage, Grant (2000).

The Resource Based View Theory (RBV) states that if there is a sustained competitive advantage a firm will be successful when all resources are used (Barney, 1991). Intangibles may represent an important source of this competitive advantage and this might explain the existing growing firms in some sectors that use this kind of resource. According to Grant (2000) the source of disturbance that creates the opportunity for competitive advantage may be internal as well as external. Internal change is generated by innovation that not only creates competitive advantage, but provides a basis for overturning the competitive advantages of other firm. This resource cannot be completely codified and hence to other organizations or imitated by them.

Lev and Zarowin (1998) remark that finance doesn't reflect the real economic situation in the firm. Nowadays the alliances, joint ventures and fusions and acquisitions may provide advantages from the intangible assets. The economic development based in knowledge caused that firms create value.

Diverse intangible assets can be found in the income statement; but there are firms that does not include it at all or it is reflected part of it. There is no consistent literature that allows capturing the whole value of intangibles. A framework was developed by Lev (2001) and classifies intangible assets in the following groups: i) discovery/learning intangibles- technology, know how, patents and other assets emanating from discovery (R&D) and learning processes of business enterprises, universities and national laboratories; ii) costumer related intangibles- brands, trademarks and unique distribution channels which create abnormal earnings; iii) human resource intangibles- specific human resource practices such as training and compensations systems, which enhance employee productivity and reduce turnover; and iv) organization capital that is a unique structural and organizational designs and business processes generating sustainable competitive advantages.

The present research uses this intangible classification because organization capital group seems to capture that specific part that it has not been measured it at all. The knowledge used to combine different skills and physical capital into systems has not been tracked by most of the firms. If we gather the account variables used to measure the organization capital, it is feasible to capture the value and most important, the repercussion in the firm performance.

Organization capital are those highly valuable intangible that develop linkage among parties to the industrial era, vertically-integrated companies were mostly physical the current essential linkages between firms and their suppliers and costumer are mostly virtual, Lev (2001). Organization capital is the ability of firms to deliver and sustain super-normal performance, Lev et al (2009). In this research is said that terms like firm's reputation, value of leadership, capacity to innovate, etc capture certain elements of organizational capital but little terms of operating measures of organization capital and empirical evidence is available.

2.2 INFLUENCE OF EDUCATIONAL LEVEL IN DETECTING ORGANIZATION CAPITAL

It is realized that countries with a strong economic power have high educational levels of students attending to schools, have higher budgets. Education is not the only variable that can explain the economic growth but by considering this information we

can realize the importance of the learning process in each country. There are some researches that are focusing on the difference of educational level; Carcolici, Cuffaro and Nijkamp (2009) analyzed the country performance by economic and educational performance. Such as knowledge-based economy (KBE) indicators is available and can be applied to different countries of economic development (Chen, 2008). Knowledge productions function in Europe through a factorial analysis (Buesa, Heijs & Baumert 2010).

It is important to consider that the basic, middle and most of the times higher education is normally provided by the governments and public expenditure on education is vital to detect any difference at the moment of provide the educational expenditure. Education promotes equality of opportunity and social cohesion. On the other hand, successive studies provide inconsistencies results about the impact of school resources on student's performance. There are some investigations that have shown that countries with high enrolment/graduation rates have grown faster than countries without.

The educational level can be used as an indicator to perform different analysis through countries comparisons. (Chen, 2008) Educational levels in certain area can provide the difference of the behavior of certain firms across the world. There are scarcely any empirical research works on regional innovation systems with aggregate data at regional level; therefore the appearance of empirical studies represents an important advance in the approach of regional innovation systems (Buesa et al, 2010). The main cause of the absence of empirical studies is the lack of regionalized statistics and sources. At the present time, there are various scattered sources of information, but there is not just one database collating data of different sorts which is available to the public.

3 HYPOTHESIS

Intangible assets stakes an essential role nowadays explaining different performance across firms in different sectors with similar resources and capabilities. There are some account aspects that are tracked by firms, but the smaller the firm, the less information is available to analyze this topic.

In 2003, Lev and Radhakrishnan proposed an Organization Capital (OC) measure, validated in Lev, Radhakrishnan and Zhang (2009) by examining its association with future firm's performance measures with operating income growth and sales growth. Previous research was done in United States with firms from different industries validating their model; highlighting the contribution of organization capital to the explanation of market values of firms, beyond assets in place.

This research proposes to contrast for several countries; the validity of the organization capital measure developed by Lev et al (2009) through their relationship with future performance and validates it with a future performance over 3 years. On the other hand, countries with diverse level of education are presented by groups, where attendance rate to school and expenditure on education is different.

Relationships in the organization between the tangibles assets and the different areas generate a frequent use of technologies, processes and designs in firms located in strong economies with higher level of education compared to those enterprises with lower levels of organization capital are located in countries with lower level of education. Those countries that provides better and detail information on educative performance would be more related to the account measure of organization capital.

4 RESEARCH DESIGN

This research presents two principal analyses. First of all, organization capital measure is reproduced and corroborated with accounting information from different countries. Methodology was developed by Lev and Radhakrishnan in 2003 and improved in 2009. The measure is corroborated by examining the association of organization capital with future firm's performance. In the second breakdown, the difference in organization capital between countries is corroborated by factorial analysis decreasing educational variables and assembles the uniformity by cluster analysis into different groups.

5 ORGANIZATION CAPITAL MODEL AND FIRM PERFORMANCE

5.1 RESEARCH METHOD FOR ORGANIZATION CAPITAL MODEL

Lev et al (2009) estimates organization capital. That research is provided preliminary evidence on the role of this specific asset in market value, the fundament of this methodology was developed by Lev and Radhakishnan in 2003, the present methodology has been improved by incorporating a firms' potential to save operating cost.

Some difficulties are perceived because the information required to reproduce the same methodology is not provided directed by the companies. Therefore, measuring variables is hard to identify because not all firms have the required information such as employee cost compensation, which would be one element of organizational capital. On the other hand, Lev et al (2009) pointed out that some enterprises have superior business procedures and culture enhancing the innovation capabilities; there are different roads that lead to a sustained superior performance.

5.1.1 Sample of Organization Capital

It is feasible to get better and detailed information from the largest firms in order to get accurate information and having the possibility to control contingencies; information at national, continental and regional level. Large firms that are in the stock market from those countries were considered, because account and financial information is provided.

The account information was taken from OSIRIS database; anglo and continental template was adopted as a category to provide accuracy for global comparisons. This database contains the required information to reproduce organization capital methodology; information from sales, general and administrative expenses was taken from other operating items variable; the information collected is presented in dollars.

The time frame adopted was from 1999 to 2009 because we are considering some changes during this period. Eleven countries were considered; only these countries have enough information per year in different sectors of productivity.

All sector of productivity were considered. In a first phase Standard Industrial Classification (SIC) with three digits were used; but information on enterprises was homologated to the Fama and French industrial classification used by Lev et al (2009) were 12 productivity sector are used. Table 1 presents the sample used by industry distribution; 91573 observations are analysed.

----------TABLE 1 HERE----------

5.2 ESTIMATION OF ORGANIZATION CAPITAL

All companies use similar resources to generate revenues: physical capital, labor and periodic expenditures for generating and maintaining the firm. In this methodology, similar accounting resources from all companies are gathered to produce organization capital measure. Variable $SALE_{it}$ is the revenues of firm in *i* in year *t;* variable PPE_{it} is net plant, property and equipment containing all monetary and physical resources that any firm use; variable EMP_{it} is number employees that firms requires to produce in *i* in year *t* and ; finally, SGA_{it} variable known as firm's sales, general and administrative expenses in *i* in year *t* which include most of the items related to organization capital such as information systems, employee training, brand promotion, distribution of channels, cost of information systems. Some information is provided by all firms and other contribution is specific for each company to organization capital. In table 2 it is observable the different variable used and their current definition. The estimated

residual of this model captures the portion of output unaccounted for capital, labor and parameter of productivity.

In order to create SGA_{it} value, other operating items variable (OOI) from OSIRIS was taken to estimate SGA_{it} replacing the information provided by the original study from COMPUSTAT database. Were SGA_{it} was capitalized and amortized the annual OOI expenses over three years

Systematic component is estimated from the residual output expression by a fixed firm specific effect, using annual growth equation as used in Caves and Barton (1990), Jorgenson (1986). In this approach, accounting variables are used to measure unobservable values.

$$\log(SALE_{it}/SALE_{it-1}) = b_{Ot} + b_{Ost} \log(SGA_{it}/SGA_{it-1}) + b_{1t} \log(PPE_{it}/PPE_{it-1}) + b_{2t} \log(EMP_{it}/EMP_{it-1}) + \log(e_{it}/e_{it-1})$$

This equation is estimated annually and cross-sectionally for each industry. This procedure yields coefficient estimates in the dummy variable; indicating the average contributions of the organization capital to revenue growth. The coefficient estimates provides the industry average efficiency Lev et al (2009).

In order to create a_{Oit} is the productivity parameter; it is required to model a function of the instrumental variable SGA_{it} as follows:

$$\log(a_{Oit}) = b_{Ost} + b_{Ost} \log(SGA_{it})$$

Organization capital is estimated by modeling firm's output sales as a function of physical capital (PPE: property, plant and equipment), number of employees (EMP) and a parameter of productivity (a_{Oit}) modelling a function of the instrumental variable SGA_{it}.

It is required to transform this coefficient into a monetary measure of organization capital to revenues by substituting the following values:

$$SALE_{it} = a_{Oit}\, PPE_{it}^{b1it}\, EMP_{it}^{b2it}\, e_{it}$$

Two variables are created carried out from the above equation.

$AbSALE_{it}$ is the contribution of organization capital to revenue of firm *i* in year *t* substracting the predicted firm's without organization capital from the firm's actual revenues. The quantity $AbSALE_{it}$ is the difference between expected sales with and without organization capital. In the very same way, it is calculated the contribution of organization capital to cost containment $AbCOST_{it}$; using the coefficient generating by

predicting the cost based on the industry average cost of the resources to achieve sales.

$AbPROFIT_{it}$ is calculated by a sum of $AbSALE_{it}$ and $AbCOST_{it}$ indicating the contribution of organization capital to operating profits for certain firm in a given time. As this results may be influenced for a positive economic year for any environmental or specific condition it is capitalized and amortized each three years in order to get an accuracy level o organization capital in the firm. In this way we create the variable OC_{it}.

In table 3 statistics of variables used to estimate the output of sales and cost function are described. The median (mean) of $SALE_{it}$ is 1.56 millons of dollars (134.425 thousands of dollars) respectively. The median (mean) of $COST_{it}$ is 1.36 millons of dollars (118.686 thousands of dollars) both variables are indicating that the sample contains small firms. Respectively to physical capital resource; PPE_{it} and SGA_{it} median (mean) are $575.104k ($31.339k) and $301.743K ($25.762k) respectively; and the mean (median) for EMP_{it} is 5.718 thousands of workers (584 workers) respectively. Values of Log ($SALE_{it}$ / $SALE_{it-1}$) and Log ($COST_{it}$ / $COST_{it-1}$) are similar exp (.050194) and exp (.046719), however growth of cost is lower than sales in comparison with Log(EMP_{it} / EMP_{it-1}) with value of exp (.020588); Log(EMP_{it} / EMP_{it-1}) with value of exp (.020588) because these growth in resources is influenced by Log(SGA_{it} / SGA_{it-1}) with value of exp (.044499); therefore, organization capital value indicates its importance in firm's growth.

----------TABLE 2 HERE----------

5.3 ORGANIZATION CAPITAL AND FIRM PERFORMANCE

5.3.1 Univariate analysis

Organization capital measure is related to three future year performance using growth of operating income ($OIGrowth_{it+i}$) and growth of sales ($SALEGrowth_{it+i}$).

$OIGrowth_{it+i}$ is defined as the average of income for years *t+1* and *t+i*, minus the operating income in year *t* scaled by total assets in year *t*. $SALEGrowth_{it+1}$ is calculated as the average sales for years *t+1* and *t+i*, minus sales in year *t* scaled by sales in year *t*. Firms are grouped into three equal groups one for each year determining a portfolio of this variable. For this analysis it is required that firms have an organization capital estimation as well as performance data for the next three years. In table 4 descriptive statistics of organization capital and firm performance are presented. OC_{it} median is $242 811.60 representing the contribution of organization capital to firms analyzed. The

mean (median) of $OIGrowth_{it+i}$ and $SALEGrowth_{it+i}$ are 0,1689141 (0,065216) 0,1685626 (0,064917), respectively; indicating the contribution of OC_{it} to sales and cost containment. This suggests that in general organization capital enables firms to achieve superior performance.

----------TABLE 3 HERE----------

Lev et al (2009) states that organization capital measure captures an attribute of efficiency that firms convert their resources into outputs, this capability should result in superior performance in future years. To corroborate this, it is performed a portfolio based on the OC measure classified in deciles. Organization capital is the capitalized abnormal operating performance measures for the three years subsequent to the year of portfolio formation. Table 5, Panel A provides the mean in cumulative growth in operating income ($OIGrowth_{it+i}$) for each group for one, two and three years following the portfolio formation. Firms in OC_{it} are described in order from the lowest to the highest deciles for all industries in that year. The mean of $OIGrowth_{it+i}$ of firms in the lowest (highest) deciles for each year are: 11.8% (51.06%) for year one, 19.37% (38.54%) for year two, 27.04% (100.06%) for year three respectively. The last two rows show the difference between the top and the bottom value for each year and the related t-statistic. It is observed that the organization capital value increase every year and on the other hand the difference among the lowest and the highest mean is bigger.

----------TABLE 4 HERE----------

In table 5, Panel B provides the mean sales growth $SALEGrowth_{it+I}$ following the same pattern to income: firms in the highest deciles present better performance than those located at the bottom of it throughout the next three years. Organization capital can be associated with future operating performance of firms if we compare $OIGrowth_{it+i}$ and $SALEGrowth_{it+i}$. Figure 1 present the difference in future operating performance in organization capital firms.

----------FIGURE 1 HERE----------

5.3.2 Multivariate analysis

Organization capital is associated with other firm characteristics, such as firm size, dividends, common shares, R&D expenditures, book value of equity among others. Lev et al (2009) estimate the following equation as a multivariate analysis.

$$OIGrowth_{it+I} = a_0 + a_1 Portfolio_{it} + a_2 SIZE_{it} + a_3 DIV_{it} + a_4 RDCAP_{it} + a_5 Ep_{it} + a_6 D\_Ep_{it} + a_7 BM_{it} + e_{it}$$

Where $OIGrowth_{it+i}$ is defined as the average of income for years *t+1* and *t+i*, minus the operating income in year *t* scaled by total assets in year *t*. $SALEGrowth_{it+1}$ is calculated as the average sales for years *t+1* and *t+i*, minus sales in year *t* scaled by sales in year *t*. $Portfolio_{it}$ is the industry based decile rank of OC_{it}. $SIZE_{it}$ is the natural log of market value of equity. DIV_{it} is the dividend to common shares, scaled by total assets. $RDCAP_{it}$ is the sum of R&D expenditures and capital expenditures, scaled by sales. Ep_{it} is net income divided by market value of equity. D_Ep_{it} is an indicator variable of net income divided by market value of equity. BM_{it} is the book value of equity divided by market value of equity.

Table 6, Panel A provides the mean coefficient estimates obtained from the annual estimation of equation for multivariate analysis. The coefficient estimates the $portfolio_{it}$ for one, two and three years ahead of operating income growth are 0,0098614; 0,0182775 and 0,0191871 respectively and all are statistically significant. The results suggest that after controlling other factors that are associated with future performance, organization capital still contributes to future growth in operating income. Comparing the portfolio results from table 5 it is recognized that other factors influence the growth performance but are correlated to organization capital.

Table 6, Panel B provides the results of estimating the equation with $SALEGrowth_{it+1.}$ It is appreciated that exist significance in $portfolio_{it}$ in the three different years as it is showed in panel A. it is suggested that the measure of organization capital is associated with future operating performance, capturing attributes that are reflected in future years.

----------TABLE 5 HERE----------

5.3.3 Univariate and multivariate analysis by country

Organization capital measure was reproduced with information from 13 countries from 1999-2009. It is appreciated that the outcome seems to be similar to the previous study from Lev et al (2009) for United States firms. The result obtained is influenced by this country but at the very same time provides values from other countries. In the following section the univariate and multivariate analysis is presented by country.

Table 7, Panel A presents only the differences from the lowest and highest deciles per country. It is observed that the coefficient has different performance in each country.

Even if there are only two countries (Greece and Switzerland) that do not follow the trend of operating performance in $OIGrowth_{it+i}$ by incrementing the coefficient value in the following years; the other countries have different performance in each year; only China, Japan Republic of Korea, Sweden, United Kingdom and United States present significant level in *t*-value. Table 7, Panel B provides the result of analyzing the differences from the top minus the bottom coefficient for $Portfolio_{it}$ in $SALEGrowth_{it+I}$ were differences are founded by each country being significative for China, France, Indonesia, Japan, Republic of Korea, United Kingdom and United States. It is observed that the level of significance is incremented in the year three and more countries seems to present better results in $SALEGrowth_{it+I}$.

----------TABLE 6 HERE----------

On the other hand, a multivariate analysis is done by country finding the following results. In table 8 is provided only the coefficient of the $portfolio_{it}$, after controlling for other major factors for one, two and three years. In table 8, Panel A provides the mean coefficient obtained from the annual estimation. The differences are smaller compared with the univariate analysis but the level of significance is affected because only three countries seem to have significativeness (China, Japan and United States). As it was observed in the previos analysis, differences among countries are showed but all of them present increment in the coefficient as the year is incremented.

In table 8, Panel B provides the coefficients values by country for $SALEGrowth_{it+1}$ being Japan, United Kingdom and United States the countries with significance . It is observable a small increment by year. In summary the organization capital measure captures certain level of efficiency attributes affecting long-term performance.

----------TABLE 7 HERE----------

This research finds evidence that organization capital captures certain value that is performed by each firm in certain sector; but it was found that the level of difference is influenced directly by country. It is feasible to determine if educative differences among the eleven countries analyzed can be affected by its educative performance.

6 COUNTRY CLASSIFICATION BY EDUCATIONAL LEVEL

6.1 RESEARCH METHOD FOR COUNTRY CLASSIFICATION BY EDUCATIONAL LEVEL

As it was pointed out before, human resources and physical capital relationships provide additional benefits to the organization, this term is known as organization

capital. This research emphasized the importance of education as an engine to have better firm performance. As it was corroborated, organization capital is an important measure of productivity; that have different performance according to each firm but also depending on the specific country where this methodology is applied.

This section corroborates that different levels of education exist among countries and this groups are related to those countries that have better performance in organization capital measure. The outcome of a successful factor analysis reduces the number of data one is working with, while maintaining the highest level of their explanatory and predictive capacity (Buesa, Heijs & Baumert 2010). After using the factorial analysis, we are going to use a Cluster methodology. This analysis is a generic term used for a set of techniques which all seek to classify a set of data into groups (Lau, 1990). Cluster divides the observations into groups based on their dissimilarities across a number of variables (Hamilton, 2006).

6.1.1 Sample of Country Education

In order to capture the most relevant information in country classification around the world we access to specialized database in this topic. A distinction between countries with higher and lower level of education needs to be built. In this case we use information from UNESCO (United Nations Educational, Scientific and Cultural Organization) that provides educational information from 200 different countries from several years. In this sample we are using 10 different variables on education from 13 countries; the period of time used is from 1999 to 2008.

Education can be analyzed in several ways, in this research we are focusing in middle and superior grade; were data from selected countries by year has be available in order to get accuracy in the results. Although, there is an inherent problem of how to select the relevant parameters (Jesus, 1990), these problems can be avoided if variables are analyzed independently. Dealing with a multidimensional system of countries, educational variables and time, it is required a research technique of data reduction such as factorial analysis, were all variables interact, rather with other series of comparisons (Dore & Ojasoo, 2001). In table 8 provides the general description for selected variables.

----------TABLE 8 HERE----------

Table 9, provides mean information educational variables by country, where duration of compulsory education is higher in UK with 11 years and Philippines only 7 years; the average of 9 years prevails in most of the countries. The gross enrolment ratio to

ISCED 5&6 (semi specialized education) is higher in countries such as Finland, Korea or United States meanwhile China, Indonesia, Philippines and Malaysia gather the lower levels. In contrast there is a general decrease, nearly 50%, in completion rate of ISCED 5A (first year so semi specialized education) in all countries. Mean of number of students in tertiary education by all countries is 3688 per 100,000 inhabitants, with superior rates in Finland, Greece, Republic of Korea and United States and lower rates in China and Indonesia. Public expenditure per pupil as a percentage of GDP per capita secondary is 35.01% in average. Public expenditure on education as % of total government expenditure represents nearly 14 % in average with a low variation between countries. Public expenditure on education of GNI achieves 4.67 % as an average for all countries. Educational expenditure in tertiary of total educational expenditure is 21.98% in average but countries like Finland, China, Malaysia, invest more expenditure than France, Japan, Republic of Korea, United Kingdom that were located above the mean in previous variables. Average researchers are calculated by total researchers / 100,000 inhabitants and Finland, Japan, Sweden and USA have the heists values for 5-7 researchers. Finally, researchers that remains in higher education prevails in Finland, France, Japan, Sweden, Switzerland and United Kingdom.

----------TABLE 9 HERE----------

6.2 ESTIMATION OF COUNTRY CLASSIFICATION BY EDUCATIONAL LEVEL

Although in the factorial analysis is not necessary to prove the classical statistical assumptions-normality homoscedasticity and linearity- it is convenient to carry out some type of test to reinforce the idea that using this technique is relevant. This analysis is based on a large number of trial and error attempts, starting with the inclusion of all the variables and including and excluding different variables. This is not only important to select the included variables and the factors. It is also to assure the consistency, reliability and robustness of the final result.

First of all, correlation among the variables is observed. The table 10 confirms clearly that in some variables exist correlations. Which at first sight would justify applying the technique. Nonetheless, working only with this information, it would be very complicated to set up groups of variables similar among themselves and in that sense it will be the findings of the selfsame factorial analysis which will confirm them. A Kaiser Meyer Olkin analysis is done to corroborate partial correlations between each two variables with the partial correlation. Thus, the optimum values of the KMO Index are

those nearest to 1 it is consider as a suitable the result of 0,5984 to use the factorial technique.

----------TABLE 10 HERE----------

Factor analysis was chosen provides simplification, combining many correlated variables into a small number of underlying dimensions (Hamilton,2006), besides achieving simplification, dimensions containing similar information is merged leading to divergent results. Linear combinations technique allows that independent variables observed obtaining new hypothetical variables-factors-uncorrelated. These new synthetic variables or factors reflect better the general aspects of the educational level than could do each of the individual variables included in the factor. Principal components and factor analysis was done providing two different factors. The factors considered were those whose value was superior to one, those factors who explain at least one variable. These extracted factors retain 83.86% of the original variance, even if explains nearly the 85% of the total variance. After some attempts, two factors are retained because of the possibility of building a dimensional graphic. Rotate factor loadings (pattern matrix) allow obtaining more interpretable factors, as well as predetermining the angle between axes.

In table 11 the total variance explained and rotated factor lading matrix is illustrated. The correspondent factors are identified to each variable in order to name the new synthetic variable by factor analysis.

----------TABLE 11 HERE----------

After gathering all the variables to each factor, two clearly interpretable factors reflect the level of education provided by a country depending on their characteristics. Table 12 present the variables retained by each factor. Factor one is called attendance to education because it was built by the duration, gross enrolment and number of students in all levels, making emphasis in specialized education, as it is expected that the organization capital is perceived in this last stage. In factor number two the public expenditure on education was agglomerated at all level; and it is expected that organization capital is related to the educational budget in any country.

----------TABLE 12 HERE----------

Having two factors consent to build a two dimension graphic per country highlighting the situation in these new factors. Literature state that those countries that provides

ambitious educational budgets expect in a medium-long term economic benefits by investing in this topic, never the less we can observe in the graphic that there are groups that do not invest large amount of money on education and some that invest in education.

On the other hand there are countries that promote facilities to education, trying to enroll as many students as the country has; all levels are perceived, from the basic education to the specialized education. In this project, it is focused to study the third level of education because it is expected that the organization capital will be correlated to the level of specialization. This graphic confirm that there are countries that present low level of attendance and some that verify a high attendance to all levels of education including the tertiary school, where the researchers are situated.

----------GRAPH 1 HERE----------

Cluster analysis divide observations into groups, based in dissimilarities across a number of countries. According to Hamilton, 2006 cluster fall into board categories, partition and hierarchical. Also, this method is used to analyze information activities in relation to socioeconomic characteristics in low, middle, and highly developed economies. (Lau, 1990).

After the factors are standardized, we proceed with the cluster analysis. Average linkage cluster analysis uses the average dissimilarity of observations between the two groups, yielding properties between single and complete linkage (Hamilton, 2006). Average link performs a hierarchical cluster using Euclidean distance as dissimilarity measure.

In graph 2 the dendogram cluster analysis is presented. Zander (2005) develops a cluster analysis from microeconomic and macroeconomic variables. In this research we will identify some characteristics that tolerate a country comparison. It is observed in the cluster tree; different options to build a cluster. In order to perform an interpretable cluster by amount of countries we choose to build four clusters.

----------GRAPH 2 HERE----------

This cluster analysis creates 4 clearly interpretable groups by educative level. We can find countries that perform better quality of education than others. In cluster 1, countries with low educative level are pointed out; these countries are characterized by having a low budget on educational expenditure. It is reasonable that the average enrolment in compulsory education and in tertiary education is lower in comparison

with the rest. In cluster 2 Republic of Korea is placed, also this country provides limited resources to education compared to the other set of countries; but maintain a higher level of enrolment and attendance to tertiary level than the first group. Cluster 3 consists of twenty one countries, which is the largest group. T his group include some of the most advanced economies in the world, they exhibit investment in educative policies and at the same time provide a higher attendance to compulsory and specialized education; in this group is expected to have better performance of organizational capital. And finally in group number 4, there are 6 countries that despite they invest in education; their rates in compulsory and specialized education are not good; meaning that their investment in education is not supported by their results on education. It is expected to find organization capital in these countries; but a lower significance than group number 3. Table 13 shows the current distribution to each country, this methodology supporting the literature on this topic.

----------TABLE 13 HERE----------

The contribution with this country classification on education is that this analysis provides evidence that there are different kinds of countries. Not all countries that has a guided governmental expenses in education experience a high level of enrolment in compulsory education or specialized education. And there are countries that need to effort educative policies in their system to strength better performances.

As it has been corroborated the organization capital measure and 42 countries are classified by their level of education; we proceed with the contrast the organization network benefits in different locations over the World.

7 CONCLUSION

Lev at al (2009) built a measure of organization capital and applied it to firms from United States, this measure was related to future performance in successive years. In this research we reproduce element of intangible asset in a set of 13 countries from 1999 to 2009 from all sectors of productivity.

OC measure was contrasted and validated by its relationship with firm's future operating performance in operating income growth and sales growth as an univariate analysis and with an equation associating the organization capital to other accounting variables such as size, R&D, dividends among others as a multivariate analysis. Our results matched up with those obtained by Lev et al research. We proceed to contrast them by different countries obtaining same trends but different level of significance

among countries, that suggest that organization capital in influenced depending on the geographic area where is performed.

The difference in education among countries explained partially the differences between the organization capital performance. In the second analysis educative variables were gathered to build factors in common, where was possible to determine that attendance to school and the level of expenditure as our determinants of different level of education.

It was interesting to find out that the significant values and better future performance corresponded with those countries that seems to appear in the higher level of education, unfortunately China was the country that obtained significance in organization capital and firm performance but in education was placed in a group of countries with low expenditure in education. It is required to obtain more educative information in this country that replace it into another group.

However there are limitations in this research such as the lack of observations that limited the sample used; there might exist other variables that reflect more consistency in the results.

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TABLES

TABLE 1. INDUSTRY DISTRIBUTION

	Industry name	Description	Total number of observatio
1	Consumer nondurables	Food, tobacco, textiles, apparel, leather, toys	81
2	Consumer durables	Cars, TV's, furniture, household appliances	32
3	Manufacturing	Machinery, trucks, planes, off furn, paper, com printing	156
4	Energy	Oil, gas, and coal extraction and products	21
5	Chemicals and allied products		33
6	Business equipment	Computers, software, and electronic equipment	184
7	Telecommunications	Telephone and television transmission	17
8	Utilities		12
9	Shops	Wholesale, retail, and some services (laundries, repair shops)	109
10	Healthcare, medical equipment and drugs		68
11	Money and finance		50
12	Other	Mines, constr, bld mt, trans, hotels, bus serv, entertainment	148
	Total		915

Categories specified by Fama -French

TABLE 2. DESCRIPTIVE STATISTICS OF VARIABLES USED TO ESTIMATE ORGANIZATION CAPITAL

	M	SD	Median	Q1	Q3
$SALE_{it}$ (US dollars)	1564529	8816282	134425	30959	599114
$COST_{it}$ (US dollars)	1367076	7705715	118686	29904	520013
EMP_{it} (units)	5.718,90	29363,45	584	149	2547
PPE_{it} (US dollars)	575104,4	3477004	31339,22	4964	161764,5
SGA_{it} (US dollars)	301743,6	1573776	25762,67	7.325.667	105169,6
Log ($SALE_{it}$ / $SALE_{it-1}$)	0,050194	0,22261	0,03868	-0,01668	0,100755
Log ($COST_{it}$ / $COST_{it-1}$)	0,046719	0,165017	0,038334	-0,01457	0,097566
Log (EMP_{it} / EMP_{it-1})	0,020588	0,166794	0,009311	-0,01911	0,053371
Log (EMP_{it} / EMP_{it-1})	0,033597	0,232208	0,017312	-0,03371	0,082269
Log (SGA_{it} / SGA_{it-1})	0,044499	0,111814	0,032294	-0,00099	0,07651

TABLE 3. DESCRIPTIVE STATISTICS OF ORGANIZATION CAPITAL AND FIRM PERFORMANCE

Variable	M	SD	Median	Q1	Q3
Organization capital variables					
OC_{it}	-2,41E+20	3,59E+22	242811,6	21725,61	1317772
$OC_{(oc/assets)}$	-6,02E+12	8,60E+14	2.354.076	0,618686	5.411.273
Operating performance and market performance					
$OIGrowth_{it+i}$	0,1689141	5.246.545	0,065216	-0,03044	0,214626
$SALEGrowth_{it+i}$	0,1685626	5.246.101	0,064917	-0,02965	0,213619
Firm characteristics					
$SIZE_{it}$	5.115.102	0,977184	5.085.593	4.461.593	5.746.564
DIV_{it}	0,0129135	0,149102	0,00189	0	0,011922
$RDCAP_{it}$	2.943.042	1.505.257	0,023629	0,002407	0,099006
Ep_{it}	3.487.993	8.166.574	0,038497	0	0,074161
D_Ep_{it}	0,1893025	0,391751	0	0	0
BM_{it}	-1.544.813	26967,76	0,646476	0,332499	1.188.445

TABLE 4. ORGANIZATION CAPITAL AND FUTURE OPERATING PERFORMANCE. UNIVARIATE TESTS

PANEL A: Operating performance is $OIGrowth_{it+i}$

	i is years after portfolio formation		
Portfolio of OC_{it}	*i*=1	*i*=2	*i*=3
1: Bottom	0,1184134	0,1937684	0,2704011
2	0,1229455	0,2038078	0,2762129
3	0,101428	0,1845684	0,253627
4	0,1219932	0,2036448	0,287796
5	0,12624	0,2137607	0,2991533
6	0,1298754	0,2397359	0,3588375
7	0,1326416	0,2527517	0,3628556
8	0,1668431	0,3137811	0,4115595
9	0,189675	0,360854	0,5309684
10	0,5116684	0,5792122	1,006004
Top minus Bottom	0,393255	0,3854437	0,7356033
t-value	2,0429**	5,1135***	5,6869***

PANEL B: Operating performance is $SALEGrowth_{it+i}$

Portfolio of OC_{it}	*i* is years after portfolio formation		
	i =1	*i* =2	*i* =3
1: Bottom	0,1182645	0,1934488	0,2702795
2	0,1225607	0,2031669	0,2753677
3	0,1011564	0,1838509	0,2529508
4	0,121743	0,2030306	0,2869204
5	0,1247794	0,2125027	0,2974873
6	0,1300362	0,2393214	0,3581151
7	0,1331447	0,2519858	0,3617313
8	0,1656994	0,3111787	0,4087846
9	0,1900948	0,360751	0,5308079
10	0,5106464	0,5779309	1,004522
Top minus Bottom	0,3923818	0,3844821	0,7342422
t-value	2,0384**	5,102***	5,6771***

**significant level at 90%: **significant level at 95%: ***significant level at 99%:*

FIGURE 1. DIFFERENCE IN FUTURE OPERATING PERFORMANCE ACROSS THE TOP AND THE BOTTON ORGANIZATION CAPITAL FIRMS

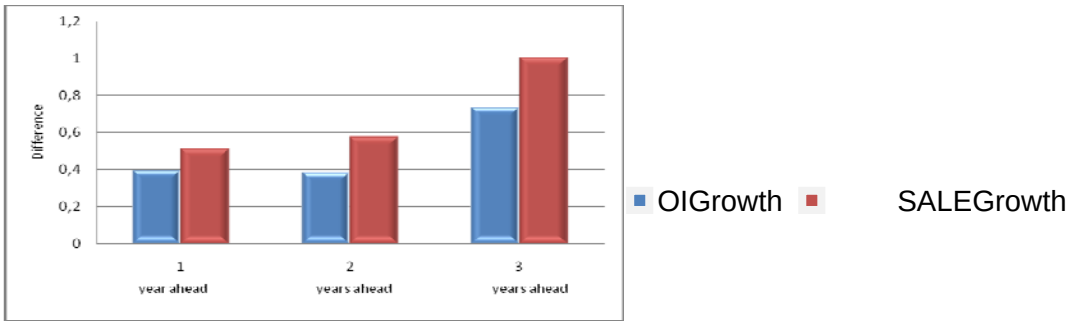


TABLE 5. ORGANIZATION CAPITAL AND FUTURE OPERATING PERFORMANCE. MULTIVARIATE TEST FOR ALL COUNTRIES

Panel A: Dependent variable is OIGrowth $_{it+i}$

	i is years after portfolio formation					
	i =1		*i* =2		*i* =3	
	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value
$portfolio_{it}$	0,0098614	3,95***	0,0182775	4,15***	0,0191871	3,08***
$SIZE_{it}$	-0,0143885	-1,78*	-0,0365502	-2,54***	-0,0792268	-3,91***
DIV_{it}	-0,0095841	-0,31	-0,0144502	-0,3	-0,0158977	-0,28
$RDCAP_{it}$	0,0000552	1,53	0,0011656	4,53***	0,000455	0,81
Ep_{it}	-0,0080067	-1,49	-0,0061184	-0,69**	-0,0117623	-0,91
D_Ep_{it}	0,0341856	2,17**	0,0718471	2,58***	0,0846616	2,17**
BM_{it}	1,24E-06	0,31	0,0000517	0,8	0,0001324	0,48
_cons	0,1318778	2,62***	0,2973733	3,31***	0,5937729	4,7***
Adj R-squared	0,0017		0,0042		0,0043	

Panel B: Dependent variable is SALEGrowth $_{it+i}$

	i is years after portfolio formation					
	i=1		i=2		i=3	
	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value
$portfolio_{it}$	0,0098698	3,96***	0,0182333	4,14***	0,0191655	3,07***
$SIZE_{it}$	-0,0146345	-1,81*	-0,0368535	-2,56***	-0,0796523	-3,93***
DIV_{it}	-0,0099314	-0,32*	-0,0147099	-0,31	-0,016146	-0,28
$RDCAP_{it}$	0,0000553	1,53	0,0011657	4,53***	0,0004557	0,81
Ep_{it}	-0,007831	-1,45	-0,0061212	-0,69	-0,0117853	-0,91
D_Ep_{it}	0,0332289	2,11**	0,0708071	2,54**	0,0832585	2,13**
BM_{it}	1,24E-06	0,31	0,0000517	0,8	0,0001325	0,48
_cons	0,1331623	2,65**	0,298866	3,33***	0,5955815	4,71***
Adj R-squared	0,0017		0,0042		0,0043	

**significant level at 90%: **significant level at 95%: ***significant level at 99%.*

TABLE 6. DIFFERENCES BETWEEN 1ST AND 10TH DECILE OF OC VARIABLE BY COUNTRY

Panel A: Difference between the 1st and 10th deciles in OIGrowth $_{it+i}$

	i is years after portfolio formation					
	i =1		*i* =2		*i* =3	
	Top minus Bottom	*t*-value	Top minus Bottom	*t*-value	Top minus Bottom	*t*-value
CHINA	-0,2081488	-5.1794***	-.474249	-6.6564***	-.692982	-5.9712***

FINLAND	.313612	2.110**	.4184954	2.1002**	.5205386	1.8671*
FRANCE	-.2707153	-1.2095	-.5281826	-2.0148**	-.8524558	-2.6297***
GREECE	.2154874	1.8552*				
INDONESIA	-.130786	-1.4147	-.452396	-2.7551***	-.6988087	-2.9239***
JAPAN	-.0923561	-3.5622***	-.1656759	-4.4198***	-.2076129	-3.3979***
KOREA REP	-.0867166	-1.5840	-.1823155	-2.7670***	-.2847339	-3.2903***
MALAYSIA	-.058756	-1.1403	-.1804738	-1.6253*	-.7338521	-1.7921*
SWEDEN	.0847202	.5287	-.3849941	-2.0181**	-.8882907	-2.6808***
SWITZERLAND	.1236948	1.6267*	.1322215	1.1436	.0354065	0.3179
THAILAND	-.0582041	-.3740	-.2991166	-1.1899	-.6341085	-2.2879**
UK	-.3460268	-1.7810*	-.9046804	-2.6161***	-2.081015	-2.7432***
USA	-.7236696	-1.6401*	-.4456383	-2.9377***	-.8754054	-3.6978***

Panel B: Difference between the 1st and 10th deciles in SALEGrowth $_{it+i}$

	i is years after portfolio formation					
	i =1		*i* =2		*i* =3	
	Top minus Bottom	t-value	Top minus Bottom	t-value	Top minus Bottom	t-value
CHINA	-.2074865	-5.1849***	-.4741682	-6.6700***	-.6931913	-5.9846***
FINLAND	.2705247	1.9953**	.369097	1.8987*	.4522222	1.6606 *
FRANCE	-.2660402	-1.1960	-.5180655	-1.9793**	-.8482316	-2.6241***
GREECE	.2177936	1.8610*				
INDONESIA	-.1521353	-1.4138	-.4494708	-2.7543***	-.691709	-2.9112***
JAPAN	-.0923512	-3.5620***	-.1656879	-4.4201***	-.2076779	-3.3989***
KOREA REP	-.0867998	-1.5855	-.1823155	-2.7670***	-.2847339	-3.2903***
MALAYSIA	-.0338559	-0.7366	-.18793	-1.7561*	-.6994611	-1.7506*
SWEDEN	.0933748	0.5797	-.3764649	-1.9814**	-.88156	-2.6834***
SWITZERLAND	.1126379	1.5164	.1164064	1.0196	.0214228	0.1940
THAILAND	-.0579198	-0.3721	-.2387332	-0.9739	-.5222461	-1.9425*

UK	-.338962	-1.7489*	-.9044195	-2.6167***	-2.080631	-2.7429***
USA	-.7243126	-1.6416*	-.4460383	-2.9405***	-.8761794	-3.7013***

**significant level at 90%: **significant level at 95%: ***significant level at 99%:*

TABLE 7. ORGANIZATION CAPITAL COEFFICIENT VALUE AND SIGNIFFICATIVENESS AS IN TABLE 6 BY COUNTRY

Panel A: Dependent variable is OIGrowth $_{it+i}$ Results of control variables are omitted.

	i is years after portfolio formation					
	i =1		*i* =2		*i* =3	
	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value
CHINA	-0,0039956	-0,56**	-0,0057845	-0,51	-0,0138107	-0,74
FINLAND	-0,0018912	-0,15	0,0061075	0,36	0,0107991	0,43
FRANCE	0,0023672	0,22	0,0164634	0,8	0,0352438	0,99
GREECE	-0,0034521	-0,5	-0,541726			
INDONESIA	-0,0247574	-1,7	-0,0259098	-1,09	-0,0015505	-0,05
JAPAN	0,0071752	4,74***	0,0154698	7***	0,0130531	6,06***
KOREA REPUBLIC OF						
MALAYSIA	0,0123033	1,46	0,0161464	0,94	-0,05665	
SWEDEN	0,0101116	0,84	0,0290832	1,88*	0,0407789	1,91
SWITZERLAND	-0,0057832	-0,36	0,0113003	0,56	0,0134336	0,49
THAILAND	-0,2637637					
UNITED KINGDOM	-0,0010245	-0,15	-0,0030461	-0,32	-0,0130453	-0,95
UNITED STATES OF AMERICA	0,0198728	2,83**	0,0312926	2,51*	0,0386779	2,24
Adj R-squared	0,0017		0,0042		0,0043	

Panel B: Dependent variable is SALEGrowth $_{it+i}$ Results of control variables are omitted.

	i is years after portfolio formation		
	i =1	*i* =2	*i* =3

	Coef.	*t*-value	Coef.	*t*-value	Coef.	*t*-value
CHINA	-0,0029016	-0,42	-0,0047578	-0,42	0	-0,74
FINLAND	-0,0025768	-0,21	0,0045798	0,28	0,0097461	0,39
FRANCE	0,0030724	0,28	0,0171178	0,83	0,0376699	1,05
GREECE	-0,0058496	-0,77				
INDONESIA	-0,0200118	-1,26	-0,0218287	-0,92	-0,0005577	-0,02
JAPAN	0,0071741	4,74***	0,01547	7***	0,0130592	6,07***
KOREA REPUBLIC OF						
MALAYSIA	0,0113985	1,37	0,0161806	0,95		
SWEDEN	0,010249	0,87	0,0283582	1,86	0,0400794*	1,91
SWITZERLAND	-0,0058187	-0,36	0,0114769	0,57	0,0114901	0,43
THAILAND						
UNITED KINGDOM	-0,0006668	-0,1*	-0,0025213	-0,26	-0,0120684	-0,88*
UNITED STATES OF AMERICA	0,0197988	2,82**	0,031075	2,49	0,0384504	2,23**
Adj R-squared	0,0017		0,0042		0,0043	

**significant level at 90%: **significant level at 95%: ***significant level at 99%.*

TABLE 8. VARIABLES DESCRIPTION ON COUNTRY EDUCATION

No.		ITEM
1	duco	Duration of compulsory education
2	gera	Gross enrolment ratio ISCED 5 & 6
3	gcra	Gross completion rate, ISCED 5A, first degree
4	nste	Number of students in tertiary education per 100,000 inhabitants
5	pect	Public expenditure per pupil as a % of GDP per capita secondary
6	peet	Public expenditure on education as % of total government expenditure
7	peeg	Public expenditure on education as % of GNI
8	eete	Educational expenditure in tertiary as % of total educational expenditure

9	rest	Average researchers; total researchers / 100,000 inhabitants
10	resh	Average researchers in higher education; total researchers in higher education / 100,000 inhabitants

TABLE 9. MEAN OF EDUCATIONAL VARIABLES BY COUNTRY

Country	duco	gera	gcra	nste	pect	peet	peeg	eete	rest	resh
	Per year	*By ratio*	*By ratio*	*Students per 100,000 inhabitants*	*By percentage*	*By percentage*	*By percentage*	*By percentage*	*Students per 100,000 inhabitants*	*Students per 100,000 inhabitants*
China	9	15,49428	6,819954	1265,565	90,06929	12,96584	1,932538	23,98415	0,7312797	0,153053
Finland	10	88,46909	54,6441	5606,019	35,84965	12,59211	6,158172	32,40927	7,096291	2,243319
France	11	54,39449	37,93468	3510,95	31,79108	11,02697	5,642277	19,62073	3,031826	1,016112
Greece	9	74,13103	17,58767	5000,539	23,84817	8,110205	3,674196	32,05517	1,493095	0,9221298
Indonesia	9	16,83742	7,879683	1627,269	16,14959	14,58188	3,042058	8,951203	0,2011962	0,1227828
Japan	10	52,83769	36,21329	3146,307	18,645	9,824584	3,521837	16,38942	5,117578	1,360853
Malaysia	6	28,50231	13,91899	2667,76	78,66269	23,31901	6,622235	33,74669	0,3504322	0,1747359
Rep Korea	9	87,99529	34,5388	6660,609	8,296727	14,858	4,125626	13,18894	3,313325	0,5606232
Sweden	10	74,56523	38,7846	4386,892	44,86245	12,97827	7,085407	27,58665	5,025728	1,642256
Switzerland	9	43,25363	24,70085	2553,21	55,97328	14,78268	5,194413	25,14544	3,353627	1,454942
Thailand	8,1	41,82552	22,16168	3431,382	30,46214	26,89318	5,139528	20,73095	0,2574204	0,1778221
UK	12	59,75109	38,80322	3733,884	27,0692	11,72466	5,144717	19,41312	2,755813	1,095736
USA	12	77,56667	33,05273	5433,594	25,55981	15,50497	5,483136	25,54197	4,424082	0,6024688
Total	9,34	53,521	28,05526	3688,431	35,01022	14,28109	4,676922	21,98287	2,562747	0,8029773

TABLE 10. CORRELATION MATRIX OF EDUCATIONAL VARIABLES

	duco	gera	gcra	nste	pect	peet	peeg	eete	rest	r
duco	1.0000									
gera	0.5079*	1.0000								
gcra	0.5141*	0.7264*	1.0000							
nste		0.9239*	0.6039*	1.0000						
pect		-0.3751*		-0.5176*	1.0000					
peet					0.3727*	1.0000				
peeg	0.3233*	0.4365*	0.4764*	0.3290*	0.3110*	0.3196*	1.0000			
eete		0.4064*	0.3605*		0.4455*		0.4669*	1.0000		
rest	0.5141*	0.7209*	0.7645*	0.5345*			0.5350*	0.3850*	1.0000	
resh	0.5079*	0.6495*	0.7045*	0.4736*			0.5681*	0.3886*	0.8575*	1

TABLE 11. TOTAL VARIANCE EXPLAINED AND ROTATED FACTOR LOADING MATRIX (VARIMAX)

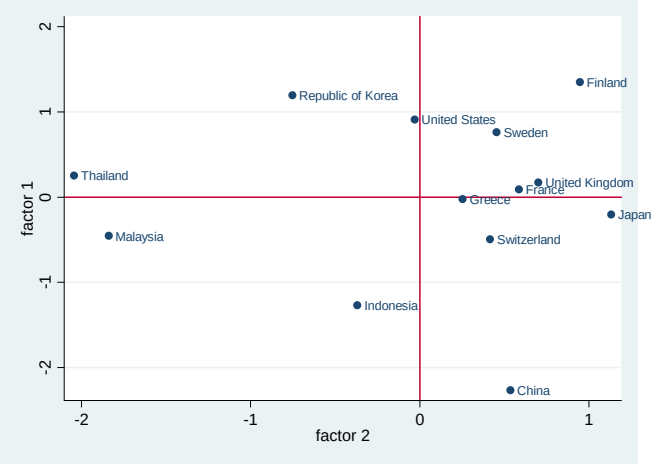
Variable	Factor 1	Factor 2	Uniqueness
duco	0.6064	-0.5164	0.3656
gera	0.9145		0.1633
gcra	0.9400		0.1163
nste	0.7846		0.3843
pect	-0.4544	0.6622	0.3550
peet	-0.4450	0.5171	0.5346
peeg	0.5186	0.6670	0.2862
eete		0.8278	0.2605
rest	0.9120		0.1682
resh	0.8380		0.2810

**Factor loadings less than 0.40 have not been reproduced and items have been sorted by loadings on each factor*

TABLE 12. TOTAL VARIANCE EXPLAINED AND ROTATED FACTOR LOADING MATRIX (VARIMAX)

Factor No.	Variable description	Factor name	
F1	Duration of compulsory education Gross enrolment ratio ISCED 5 & 6 Gross completion rate, ISCED 5A, first degree Number of students in tertiary education per 100,000 inhabitants Average researchers; total researchers / 100,000 inhabitants Average researchers in higher education; total researchers in higher education / 100,000 inhabitants	Attendance to education (basic and specialized)	atted
F2	Public expenditure per pupil as a % of GDP per capita secondary Public expenditure on education as % of total government expenditure Public expenditure on education as % of GNI Educational expenditure in tertiary as % of total educational expenditure	Expenditure on education (all levels)	exped

GRAPH 1. COUNTRIES PER FACTOR ANALYSIS



GRAPH 2. COUNTRIES PER CLUSTER ANALYSIS BY DENDOGRAM

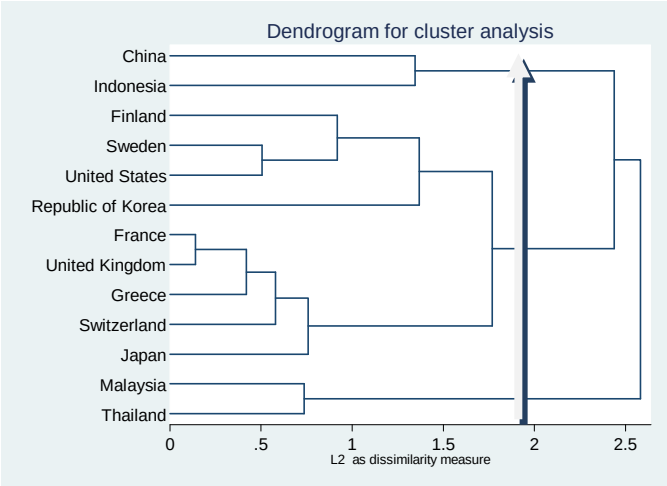


TABLE 13. CLUSTER BY COUNTRY PER EDUCATIVE CLASSIFICATION

Cluster No.	N	Country name	Mean f1	Mean f2	Significative difference f1	Significative difference f2
CL1	1	China Indonesia	1	1	CL2	CL2
CL2	1	Finland Sweden United States Rep. of Korea France UK Greece Switzerland Japan	2	7	CL3	CL1
CL3	1	Malaysia Thailand	2	0	CL1	CL2